Simple Business

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A book about trade and commerce

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Terminology

In this text, “business owner”, “business operator”, “shareholder” and “investor” all refer to the same situation.

This refers to an individual that invests money in a business enterprise, and receives the profits from the enterprise.

Technically, the term “shareholder” may only apply in the case that the business operates using a company as the legal structure.

In the case of a partnership, the term “partner” may be used.

“Net assets” and “equity” refer to the same thing, being the funds that are held within the business, which are indirectly owned by the investors.

“Net profit” and “net income” and “earnings” all refer to the increase in assets within the business due to the business operations.

In the context of accounting and financial management, a “cash” transaction may involve receiving or paying money.

This may not involve physical currency such as banknotes and coins.

A payment by cheque or a direct account transfer may be a cash transaction in the context of finance.

Examples of non-cash transactions may include the change in the value of a fixed asset.

“Property” in the legal and financial context may refer to anything of value that is owned by the business, and may include cash, equipment, patents, land and buildings.

A “party” refers to an individual or situation that may be involved in a contract, negotiation or transaction.

This may include an individual, a company, a partnership, a trust deed arrangement, and so on.

A “listed” company is a business that is organised as a company structure, with the shares being traded on a stock exchange.

Most large business enterprises are listed companies.

1. Business

1.1. Business activity through history

Business is not an invention of the modern age.

Business activity in modern times is essentially the same as the business activity that occurred during the time of the Romans, 2,500 years ago, and during the time of the Egyptians, 5,000 years ago.

Trade and commerce has existed in essentially the same form for as long as there has been recorded history.

Business activity has not occurred at all times and in all places.

During many periods of history, life involved basic physical survival, while in other times and places, individuals lived in small tribal groups that did not engage in trade.

However, when occurred, business activity had the same nature and structure in the past as it does in the modern world.

The Egyptians kept detailed inventory records and entered contracts (** check contracts).

Trade was conducted with foreign lands, and commercial disputes were settled in a court.

In the time of the Romans, various currencies were in use, and foreign exchange transactions were performed to exchange money in one currency for money in another currency.

Before the time of the Romans, wheat was harvested and fruit was picked in exchange for payment, money was borrowed, and debts were repaid.

During the XX century, trade along the Silk Road route through Asia carried silk and spices from the far east to Europe, and XX (**check) from Europe to the far east.

The Pyramids of the ancient Egyptians and Aztecs could not have been built without large-scale project management.

The best-known phrase regarding business activity, “Caveat Emptor”, was coined in Latin.

This phrase translates into English as “buyer beware”.

1.2. Commercial activity

Commercial activity includes producing items for sale, performing services for fees, and trading one item for another.

Trade involves buying and selling, and exchanging one item for another.

Trade is a major part of commercial activity, however it does not involve any creation or production of its own accord.

Trade simply involves exchanging one item for another item.

In most cases one of the items will be an amount of cash, however the net value that is held after the transaction is the same as the amount held before the transaction, all else being equal.

Producing items of practical value may involve farming, manufacturing items from raw materials, building, and any other activity which results in creating an item of practical use.

Services involve any activity that is practically useful of its own accord, rather than activity that results in an item being created.

This includes personal services such as haircuts, organising projects, transactions, events, and transport.

Commercial activity does not involve activity that is not directed at trade with others.

For example, constructing a building for personal use, or creating an artistic work, are not commercial activities.

However, if these items were later sold to another party, then the sale itself would be a commercial transaction.

1.3. Business

Business involves conducting activities of a commercial nature.

This includes organising production, transporting goods, and conducting commercial transactions.

Conducting a business activity involves four fundamental steps.

1. Creating a business facility.
2. Producing items or performing services.
3. Paying expenses.
4. Receiving payment from clients or customers.

Creating the business facility may not involve any particular steps apart from commencing the activity. In other cases a range of different steps may be involved, such as the following items.

- Arranging funding from debt or internal funds to pay initial expenses.
- Registering with government departments for tax, licenses, regulation and other purposes.
- Arranging insurance that is legally required or prudent for the particular activity.
- Buying or leasing equipment.
- Leasing premises.
- Purchasing raw materials.
- Employing staff.

In larger enterprises this may involve constructing manufacturing facilities, and assembling an entire organisational structure.

Expenses involve any payments that result in an outflow of funds from the business. This could include

- Payments for raw materials.
- Payments for services such as legal and accounting services.
- Payments to employees and contractors.
- Taxes.
- Interest payment on debt.
- Rent of premises.
- Lease payments for equipment.
- Marketing, promotion and advertising costs.
- Commissions and payments to agents and distributors.

Fees and charges are made in various ways. This includes some of the following alternatives.

- Fixed dollar cost for the sale of items.
- Time-based charges, such as an hourly rate for services.
- On-going regular fees, such as a monthly charge for regular maintenance.
- Percentage commissions and fees based on the size of the transaction.

1.4. Creation & Battle

Business may involve two distinct activities; creation, and battle.

1.4.1. Creation

Creation involves producing items, designing products, creating artistic works, and other activity that results in items being created for later sale.

Performing services creates value, although this may not be in a tangible form.

1.4.2. Battle

Battle may involve attack, defence, and contest.

Attack

Attack occurs on a personal level during commercial transactions.

For example, pressure and intimidation may be applied to induce a person to buy a product, select a service, or conduct a transaction.

Attack also occurs within competitive markets.

For example, in comparative advertising, a direct comparison may be made with a competitor's product as part of the marketing campaign.

In other cases, the clients or customers of a competitor may be directly targeted, as a way of increasing sales.

Attack also applies to breaking through barriers to entry in closed markets.

In some markets, a new business may be prevented from operating in the market by long-term links between suppliers and customers, licensing restrictions or proprietary technology.

At airports, for example, a limited number of ports may be available for aircraft, and if all ports were tied in long-term leases this may prevent other airlines from operating at that facility.

Defence

Defence applies to direct attacks from competitors, and also to the case of changes in the environment in which the business operates.

Attacks may arrive in forms such as price wars within an industry, where one supplier reduces prices drastically to increase sales and gain a larger share of the market.

A response this may require reducing sale prices to below the costs of production to defend the existing market share, resulting in unsustainable prices.

In the more general case, problems may occur with falling sales, defaults on payments from customers, damage to equipment, and a range of unexpected events that affect the survival of the business.

Defence involves structuring the business, and preparing backup plans and facilities, so that the damage caused to the business from a range of possible events may be minimised.

Contest

Contest occurs within business when an activity involves a direct competitive process.

Purchasing a property at an auction is an example of contest. In this situation, competing bids are submitted until the property is sold.

Lodging competitive tenders to purchase an asset or win a customer's account for a service agreement is also a contest situation.

1.5. Growth & survival

1.5.1. Survival

Survival is primarily a cash flow issue.

While long-term growth involves development, assets, and profitability, survival in the short and medium term involves cash flow and available cash reserves.

In cases where the cash inflow is less than the cash outflow, the operation of the business would be unsustainable on a long-term basis.

This would eventually reduce the assets within the business to zero, and the business would cease to operate.

In other cases the inflow may be less than the outflow on a temporary basis due to seasonal changes, the timing of large cash transactions, or funding of a major development or start-up activity.

In these cases, survival may be dependant on a combination of increasing available funds, reducing outflows, and increasing inflows.

Raising funds can occur through selling assets, using overdrafts, and loan facilities.

In these situations additional debt cannot usually be raised, however existing debt facilities may be available.

Reducing expenses may involve some of the following steps

- Changing an expense to an alternative with a lower cost, such as moving to alternative premises with a lower rent.
- Postponing expenses that do not relate directly to existing production, such as research and product development.

- Cancelling expense items such as reducing employee numbers, cancelling services, and closing projects or parts of operations.

In general there is little direct control over income. In some cases income could be increased with some of the following steps

- Cancelling discounts, subsidies and other benefits provided with sales.
- Increasing prices.
- Advertising and promotions. However, in these cases the results of the marketing campaign may not flow through quickly enough to offset the cost, and cancelling the cost of promotions may be of greater benefit that spending funds with the aim of increasing sales.

1.5.2. Growth

While survival involves stabilising cash flow, growth involves development of products, using assets affectively, and profitability.

A stable cash flow is necessary to fund growth and development, however this does not lead to growth of its own accord.

Profit

Profit or loss is the change in the total assets of the business due to business activities.

This does not include changes in assets due to capital transfers, such as raising or repaying debt.

Capital transfers make the business enterprise larger or smaller, but do not reflect a creation or destruction of total value.

Net profit includes the difference between the cash inflow and cash outflow over a period of operation.

A change in the value of the business's assets can also occur when the value of a fixed asset changes.

Depreciation is the reduction in the value of an asset over time.

For example, equipment worth one hundred dollars at the end of the previous year may only be worth ninety dollars at the end of the current year.

In this case, the value of the business has declined by ten dollars, even through no cash transactions may have occurred.

Equipment is generally recorded in the accounts of the business with a value that declines over the useful life of the item, with the depreciation expense being included as an outflow of value.

Profit is a separate issue from cash flow.

Net profit is equal to the net cash flow, plus the change in the value of other assets.

Due to changes in the value of fixed assets, a business may have positive or negative cash flow, and separately have positive or negative profit.

For example, if the inflow to the business is greater than the outflow, then cash flow will be positive.

However, if the value of the equipment declines by more than this amount, then profit will be negative.

Conversely, the cash outflow may be greater than the cash inflow, leading to negative cash flow.

However, if the value of an asset increased significantly, then the profit may be positive.

While cash flow determines the survival of the business in the medium term, the net change in value also includes non-cash items such as depreciation.

Growth

Growth involves the following elements

- Creating a product or service that is attractive to customers or clients.
- Delivering the product at a price that is low enough to result in the product being purchased.

- Advertising, promoting and marketing to ensure that the product is available to customers, and that potential customers are aware of the product.

- Producing the product on a profitable basis, with income from sales exceeding costs.

- Maintaining careful control over costs.

- Maintaining defensive facilities to avoid serious damage to the business due to problems such as cash flow shortages, fire, equipment failure, and loss of major suppliers or customers.

- Re-investing in new products, projects and replacement facilities on a regular basis.

1.6. Lies & deception

Lies and deception may be a significant part of the business environment.

For example, an offer may be submitted to purchase an item.

The seller may later respond by saying that they have received a higher offer from another source, and requesting that the price be increased.

In some cases this may be true, while in others it may not be.

Direct false statements are generally limited to small transactions.

In larger transactions, similar problems may arise due to the image and illusion of the situation not reflecting the actual nature of the situation, rather than a statement being strictly false.

For example, a business preparing for sale may cancel the regular maintenance of equipment.

This could lead to a large reduction in costs, and a resulting increase in reported profit.

In this case, the profit that was generated by the business would not be a sustainable figure, as the equipment would cease to function in a short timeframe if the maintenance was not restored.

In this example, a purchaser failing to make the necessary checks may place a value on the business that was a poor estimate of the business's value.

In other cases, a tone of voice or attitude may create an impression of a situation that is not accurate.

For example, an impression may be created that a negotiation is proceeding on a one-to-one basis, when in fact negotiations are also proceeding with other parties in the background.

In cases such as these, an independent assessment of the situation is necessary, rather that relying on an impression put forward by another party.

Problems can also occur with statements that are made in good faith, but are incorrect without the knowledge of the person making the statement.

Problems with these situations can be reduced in a number of ways.

1. Statements made by other parties may have limited relevance to the decision that is involved. They may be deliberately deceptive, or may be made in good faith but may be incorrect due to other reasons.

Information supplied by other parties may be far more damaging than having no information at all.

Incorrect information can lead to mistaken conclusions, false impressions, and taking actions that lead to future losses.

Direct investigation is necessary to arrive at a valuation or conclusion, ignoring outside information wherever possible.

2. Some situations pose a greater risk of these problems occurring than others.

For example, purchasing an item by auction allows the possibility of false bids being submitted to raise the price, while this cannot occur with an item purchased at a fixed price.

In some cases these situations cannot be avoided, while in other cases, alternative approaches can be taken to reduce the exposure to this type of problem.

3. In a negotiation situation, problems may be reduced if the issues involved in the negotiation are thought through before the negotiation commences, and decisions such as minimum prices are made in advance.

In some cases this may result in a transaction failing to proceed.

However, this may be a desirable outcome, while in other cases it may be a cost of the negotiation process.

4. Valuation is based on information.

This includes information about the item itself, and general information about its usefulness and the value of similar items.

Gathering a range of information independently may reduce problems in these situations.

5. In some cases, independent valuations can be arranged.

This option is available for properties, sales of businesses, and most large transactions.

Independent valuations do not generally rely on information supplied by others, apart from information submitted as a general input to the process.

6. Auditing and other reviews of information can be used to check the accuracy of information.

7. Where possible, buying and selling in open markets can be used to reduce many of the problems with individual negotiation.

A price in an individual negotiation may be set by the perceptions of the buyer and seller, the limited knowledge of the parties, and in some cases by intimidation, manipulation and strength of personality.

In an open market, prices are set by supply and demand.

In turn this is based on a large volume of information, and by a multitude of individual decisions.

Some items, such as artworks, are traded at prices that reflect the personal value placed on them, rather than their practical value.

In general, however, prices of items such as property, investments, equipment and general goods trade at a price that reflects their practical value.

1.7. Operation

1.7.1. Record keeping

Accurate record keeping is the foundation of a successful business activity.

Financial records involve a record of cash receipts and cash payments, purchases and sales of assets, and changes in asset values.

Other records include stock inventories, customer and shipping details, and product information.

Financial records can be reconciled against bank statements to correct missing items and errors.

In the case of stock lists, these can be checked by a manual stock count.

1.7.2. Cash facilities

Cash flow problems can occur due to some of the following events:

- Timing problems, where large payments are due before income amounts are received.
- Defaults on payments by customers, such as accounts not being paid by the due date.
- Slow sales.
- Seasonal issues, when sales occur at certain times of the year.
- Cash outflows related to large development projects

Cash flow problems can be reduced by maintaining an adequate cash balance, and by maintaining stand-by credit facilities such as overdrafts.

Credit facilities are a defensive facility that must generally be arranged in advance, as additional credit cannot usually be raised during times of financial distress.

Businesses that operate with narrow margins, with large cash inflows, large cash outflows and a small margin of difference, may be more susceptible to cash flow problems that other businesses.

In these cases, larger cash balances or credit facilities may be required.

1.7.3. Financial Management

Operating a business involves two major issues.

Operational management involves organising the activities of the business to result in a smooth and efficient operation.

Financial management involves managing the cash flow, margins, assets, costs and prices of the business to create a flexible and profitable operation.

Money is the blood that flows through the veins of a business enterprise.

In some cases, the main business operators may leave the financial issues to another party, such as an accountant for a small enterprise, or a chief financial officer or financial controller in a large enterprise.

However, financial issues are the foundation of a successful business enterprise, and a business cannot be developed and operated successfully without an understanding of the financial issues involved and attention to these issues.

1.7.4. Uncertainty & flexibility

The future is inherently uncertain, and events rarely unfold exactly as expected.

Flexibility is fundamental to survival when unexpected changes occur.

For example, during a prolonged period of slow sales, moving to alternative premises with a lower rent could be used to reduce costs. However, this option would not be available if the property was occupied with a long-term lease.

As another example, where a long-term agreement to supply a customer specified a fixed price, this could cause problems if the price of raw materials rose sharply.

In general, any situation that cannot be altered in a short or medium term timeframe reduces the flexibility of the business to adapt to changed conditions, and could lead to serious problems if adverse events occurred.

Maintaining alternative suppliers, adequate cash and stock levels and stand-by credit facilities could be used to reduce the exposure to unexpected changes.

2. Elements of Business

2.1. Recordkeeping & Accounts

A business cannot be managed effectively unless accurate and up-to-date information is readily available.

This could include the following information

- Customer details, such as name and shipping address.
- Details of orders placed, such as the item description and shipping details.
- Inventory and stock lists.
- Details of arrangements in place, such as regular maintenance contracts.
- Product specifications and information.

Financial records include details of payments, receipts, assets held, purchase and sale transactions, and other items such as depreciation rates.

In a cash flow-based service business, accounts may supply reflect cash receipts and cash payments, with net profit being the excess of receipts above payments.

When assets are held within the business, additional complexity arises from depreciation values, intangible assets and so on.

2.1.1. Uses of Accounts

Accounting and other financial records are needed to effectively manage and operate a business.

This may take the form of reports of transactions that have occurred over various time periods.

Reports of non-financial information , such as the number of new customers, the number of customer cancellations, and the volumes of goods produced, may also be needed on a regular basis.

A full set of financial statements may be produced once or twice a year, although the key information would generally need to be generated on a monthly basis.

Depending on the type of business and legal structure, financial statements may need to be lodged with stock exchanges, government regulators, and issued to shareholders.

Financial statements are also analysed in situations where other businesses are purchased.

2.1.2. Basic Accounts

Basic accounts require a record of each transaction that has occurred, along with two financial statements.

The financial statements are a balance sheet, and a profit-and-loss statement.

Balance Sheet

The Balance Sheet contains a list of the assets of the business, which are any items of value owned by the business.

Liabilities are any amounts that are owed, which mainly comprises debts such as bank loans. The difference between the two figures is the net assets of the business.

The balance sheet applies at a particular point in time.

For example

Balance Sheet as at 30th June 2002

Assets	
Equipment	200
Raw Materials	30
Cash at bank	7
Total Assets	237

Liabilities	
Bank loan	25
Overdraft	3
Total Liabilities	27
Net Assets	210

In this case there are three assets, including equipment, raw materials and cash on deposit at a bank. The total value of the assets is $237.

Liabilities include a bank loan and a cheque account overdraft, with a total value of $27.

The total assets, subtracting total liabilities, leads to a net assets figure of $210.

The net assets figure is also known as equity, shareholder's equity or shareholder's funds.

Profit-and-Loss statement

The profit-and-loss statement records all transactions that have occurred over a period of time.

This includes all payments received, and payments made.

A full accounting profit-and-loss statement includes items such as depreciation, which apply to the change in the value of assets.

These items do not reflect actual cash transactions, however they do affect the value of the business's assets, and so they affect the profit or loss.

However, in many cases these items are not of significant size, or can be considered as a separate issue from the operation of the business.

Using a basic accounting approach, a record of all income and payments is sufficient to record the changes in cash levels from the operation of the business.

For example

Profit & Loss Statement

30th June 2001 to 30th June 2002

Revenue	
Income from sales	71
Expenses	
Rent	17
Utilities (gas, electricity)	3
Payments to employees	15
Materials	22
Interest	2
Tax	3
Total Expenses	62
Net Income	9

In this example, the income amount is $71, which is the amount received from sales.

Expense payments total to $62.

The net income is the cash received less the cash payments, which is equal to $9.

These balance sheet and profit-and-loss statements use a cash-based accounting method.

This accurately records the financial position of the business over the period of the statements.

However, there are some limitations with this approach.

The major limitation with this cash-based method is that it does not record the depreciation in the value of the equipment.

In this example, equipment with a value of $200 is recorded in the balance sheet.

If the value of the equipment declined to $180 over the year, then this would represent a $20 loss to the business.

This amount could be included as a depreciation expense, to more accurately reflect the net profit of the business over the periods.

Most physical assets decline in value over time, and a depreciation expense is generally calculated by allocating the cost of the asset over the usable life of the equipment.

This is broadly similar to recording a declining in market value, although the accounting approach is a book-keeping approach, rather than a market-value approach.

The other major difference between a cash accounting system and a full set of accounts is the accrual accounting method.

This approach records each transaction in the period that it applies to, rather than the date that the actual payment is made.

Accrual accounting produces a more accurate record of the changes in value during a particular period than cash-based accounting.

However, accrual accounting is more complex to implement and reconcile, and many organisations use cash accounting instead.

Basic accounts such as these would generally be suitable for managing businesses that did not involve large items of equipment, and for the purposes such as bank loans.

Basic accounts would not be suitable for capital-intensive industries involving significant equipment or plant values, or for formal reporting to regulatory authorities and stock exchanges.

2.1.3. Double-Entry Bookkeeping

Accounting is based on a system known as double-entry bookkeeping.

This was first developed by a monk to record lists of stocks and transactions at a monastery, around the year (** check).

With double-entry bookkeeping, a set of accounts it held.

An account may correspond to a bank account, or may simply record a pool of funds set aside for a particular purpose.

All transactions are entered twice, as a transfer from one account to another.

For example, money transferred from one bank account to another would be recorded as two entries, one in the account that the money was transferred from, and another in the account that the money was transferred to.

This would represent an increase in the value of one account, and a reduction in the value of the other account.

Bank statements are printed from the point of view of the bank, which is the opposite of the depositor's position.

Due to this, the common usage of "credit" and "debit" is the opposite of the strict accounting usage.

In accounting terms, a "debit" is a transaction that increases the value of an account, while a "credit" is a transaction that reduces the value of an account.

Double-entry bookkeeping is not necessary in order to accurately record the financial transactions of a business, and produce financial statements.

However, accounting software, banking and the accounts of large enterprises often use the double-entry method.

2.1.4. Accrual Accounting

Transactions are recorded using a cash-based method or an accrual method.

This applies whether a single-entry or double-entry method is used to record the transactions.

Under cash-based accounting, a transaction is recorded on the date that the payment is made or received.

In the case of cheque payments, the date recorded would generally be the date that the cheque was issued, although the cheque may not be presented and clear until some time in the future.

Under accrual-based accounting, transactions are recorded when they become effective, rather than when the cash actually changes hands.

Accrual accounting records transactions on dates relating to changes in value, while cash accounting records transactions on the date that the cash flow occurs.

For many cash payments, there is no difference between the two systems.

Although it would be an unusual case in practice, an example of an accrual would be the rent on a property that was paid annually.

Under cash-based accounting, no transaction would be recorded for the first eleven months, with the full rent payment being recorded in the twelfth month.

Occupying the building for six months would effectively be an expense equal to half the yearly rent, even though the payment itself would not by due until the twelfth month.

Accrual accounting would handle this situation by recording a transaction in each month for the rent that was used that month, even though the cash payment would not occur until the end of the year.

A similar situation arises when work has been performed and an invoice has been raised to be presented to the client, but the payment itself has not been received.

Accrual accounting more accurately reflects the value of the business and the value of expenses and income across periods of time than cash-based accounting.

However, accrual accounting is more complex to implement and reconcile than cash-based accounting.

Also, accrual accounting looses the link between the accounting records and the cash available within bank facilities.

This may lead to cash flow problems in some circumstances, and would particularly affect a business that included large inflow and outflow payments, rather than a steady stream of regular payments.

For example, issuing a large volume of invoices would lead to a large income figure being posted under an accrual system, however no cash would actually have been received, and cash would not be available for the payment of expenses.

When accrual accounting is used, separate cash flow records must be maintained from the accounting records to properly manage cash flow.

2.1.5. Financial & Accounting Concepts

Cash transfers & value transfers

Financial statements involve a separation between the concept of "cash" and the concept of "value".

Cash represents holdings in bank accounts.

Value represents a holding of value that the business owns, and includes cash, equipment, buildings, and expected payments from customers.

In some transactions, cash is transferred but there is no transfer of value.

In other events, value is transferred but there is no transfer of cash.

An example of the first situation occurs when an item of equipment is purchased.

Cash leaves the business and the cash balance decreases.

However, the value of the equipment replaces the value of the cash paid out, and there is no change in total value.

This represents a transaction that changes the business's assets from one form to another, without increasing or decreasing total value.

In this example, cash is exchanged for the equipment.

An example of the opposite situation is the reduction in the value of the equipment.

In this situation, there is a change in value, due to the reduction in the value of the equipment.

However, no transaction occurs, and there is no transfer of cash and no change in the cash balance.

The two separate concepts of cash transfer and value transfer are the basis of the financial analysis of a business, and are the basis on which the financial accounts are prepared.

Bookkeeping allocations Vs. market values

A second issue relates to the bookkeeping approach used in accounting.

In some situations, accounting operates on the basis of counting items in various ways, that do not reflect either cash transfers or value transfers.

This is a third situation that is based on ensuring that all items are fully recorded, even through the record may not reflect a cash or value situation.

Depreciation is an example of this.

A machine may be purchased for $100, with a useful life of ten years.

Under straight-line depreciation, an expense of $10 would be recorded in each year.

The asset would be listed in the balance sheet with a value of $100 in the first year, $90 in the second year, $80 in the third year and so on.

This is done to match the expense in each year against the income produced from the machine in the same year.

However, the $10 amount is a bookkeeping entry, it does not match a cash transaction, and it may not match a value transfer.

This is an important issue in the sense that entries in financial statements, such as the values listed for assets, may be quite different from market values.

An alternative view of depreciation is that the depreciation expense reflects the reduction in the market value of the equipment, while the entry in the balance sheet reflects the new market value following the decline for that year.

This is not strictly the approach that is used in bookkeeping.

However, when the depreciation rate approximately equals the decline in market value, the resulting figures may be similar.

2.1.6. Financial Statements

(** check accounting definitions)

Financial statements are prepared according to a set of accounting standards.

These standards are set by a national accounting authority, and are detailed and rigid in defining the way in which a wide range of individual transactions are recorded in the accounts.

However, in many situations there is scope to classify amounts in several ways, or to perform calculations using a number of alternative methods, and these differences can have a significant bearing on the overall structure of the accounts.

Accounting standards vary significantly from place to place and from time to time.

Audited accounts are required for formal reporting to regulatory authorities, for reporting to stock exchanges, and for information supplied to investors.

The audit process is conducted by independent auditors, and may be performed by accounting firms.

The audit process includes the following steps

- Reviewing individual transactions at random.
- Reviewing the way in which major items are allocated in the accounts.
- Checking that adequate standards exist for recording transactions, reconciling information sources and preparing financial statements.
- Ensuring that the financial statements are prepared in a way that is consistent with the accounting standards.

Audited accounts include a signed statement by the auditors that they have reviewed the preparation of the accounts, and that in their opinion the accounts have been prepared in a way that is consistent with the accounting standards.

The purpose of the audit process is to check that the figures that are presented are an accurate reflection of the transactions that actually occurred during the period.

The audit does not involve making judgements about the historical results or future prospects of the business, and it does not generally asses the relevance of the valuations applied to assets.

A separate director's declaration is required in some reporting situations. The director's declaration is a signed statement to the effect that, in the director's opinion, the company will be able to meet is debts as and when they fall due.

This declaration is intended for the use of lenders and creditors to the company, as information regarding the on-going viability of the business.

However, accounts are generally prepared quarterly or half-yearly, and the information may not become available for several months.

In practice, a company can change from a stable financial position to near bankruptcy in a matter of months, and the director's declaration provides little assistance to lenders.

The primary financial statements are the balance sheet, profit-and-loss statement, and the cash flow statement.

2.1.6.1. Balance Sheet

The balance sheet records the assets and liabilities of the business at a certain point in time.

The assets include all physical property such as land and buildings, equipment, production facilities, and cash holdings.

In some cases, the value of intangible assets can also be included. The value of a newspaper masthead, for example, can be included as an asset within the balance sheet.

Liabilities includes all debts owed by the business, such as bank loans, bonds and debentures issued to investors, and amounts owed to other companies.

Liabilities also includes other amounts that are owed by the business, such as payments due that have not yet been made, amounts owed as a result of court cases and so on.

The Net Assets figure records the difference between the value of the assets and the value of the liabilities.

This is the net value of the business in terms of the value of assets on the balance date.

In theory, if all assets were sold at their listed value and all debts were repaid, the final amount remaining would equal to the net assets figure.

The net assets value is also known as equity.

Assets

"Current assets" are assets that could readily be converted into cash.

These assets are part of the ongoing operation of the business and would be expected to be converted to cash within one year.

These include

- Cash on deposit at a bank.
- Short-term money investments, such as 90-day bank bills.
- Accounts receivable – amounts that have been billed to customers, but have not yet been received.

"Non-current assets" are assets of a long-term, capital nature that would not be expected to be traded within a one-year period.

These include

- Land.
- Buildings.
- Production facilities.
- Intangible assets
- Goodwill

“Intangible assets” are items that the business owns and that have value, but are not physical objects.

A license to operate in a certain market may be an intangible asset.

The inclusion of intangible assets is limited to certain items.

However, the value of the following items can generally be included within the balance sheet as assets.

- Patents, such as a patent on new production technology.
- Newspaper mastheads and media titles, such as the value of a well-known newspaper title.
- Licenses, such as a licence to use a radio spectrum for mobile telephone services.
- Brand names and trade marks.

“Goodwill” is an accounting item that is included when a business purchases another business.

Originally this term related to the regular customers and reputation that a business had as a going concern.

This resulted in a higher price being paid for the business, compared to the dollar value of the stock and buildings that were purchased.

In practice, this relates to any situation where the price paid for a business exceeds the value of the net assets of the business being acquired.

This occurs in most purchases of businesses.

For example, a cash flow-based service business that leases equipment and premises may have very few assets, although it may have significant positive cash flow and value as a business.

In other cases a premium is paid due to the increased value that is expected from combining the purchased business with the existing business, or as a means of gaining entry to a closed or unfamiliar market.

Under the accounting standards, goodwill cannot be included in the accounts due to internal generation. This item is only included when a business is purchased.

Money that is owed to the business is an asset.

This is due to the fact that, when the amount is paid, money is transferred into the business.

In the case of money that is due from product sales or services, this item is generally included as “accounts receivable” or “trade debtors”.

In some cases, such as bonds that are traded on stock exchanges, the item itself can be sold to another investor to recover the funds, without the original borrower repaying the debt at that time.

“Writing off” an asset involves abandoning the asset as lost.

This may occur when an asset is lost or destroyed, such as an item of equipment being destroyed by fire.

This situation also occurs with bad debts, when efforts to recover the funds have failed.

In this situation, the asset is removed from the balance sheet.

An expense is added to the profit-and-loss account to record the fact that a loss has been recognised, and that the net asset figure of the business has reduced by that amount.

A write-up occurs in that case that an asset has been written off, but is later unexpectedly recovered. In this case the asset is restored to the balance sheet.

Liabilities

“Current liabilities” include debts that are part of the regular operation of the business.

This includes amounts that have a term of less than one year, and amounts that are repayable at call.

This includes:

- Bank overdrafts.
- Short-term bank loans, such as seasonal financing through different periods of the year.
- Accounts payable – amounts that are due for payment, but have not yet been paid.
- Provisions – amounts set aside for specific purposes.

"Non-current liabilities" are amounts of a long-term nature would not normally be repaid within a year.

This includes

- Bank loans.
- Bonds and debentures used to borrow funds from investors.
- Non-current provisions.

"Provisions" are amounts that are set arise for specific purposes. For example, a provision may be recorded for employee long-service leave.

This would appear as an entry under liabilities.

If this amount was funded by cash, this figure would balance against part of the cash recorded under the assets section.

For example

Assets	
Cash	100
Libilities	
Provision for long-service leave	20
Net Assets	80

In this example, the “provision for long service leave” entry records that fact that $20 must be carried forward and reserved for specific future purposes, even through it is not currently due for payment.

This balances against the $100 of current cash, to result in a net figure of $80 of free cash.

“Contingent liabilities” are amounts that may be due for payment if certain circumstances arise.

For example, a court case may currently be in progress. If the result is unfavourable, then a payment may be due.

In this case, the amount would be recorded as a liability in the accounts, with a note describing the details of the item.

Net Assets

The “net assets” figure is the difference between the total assets and the total liabilities.

This figure is sometimes recorded as several separate reserves, such as an asset-revaluation reserve, which may appear when an asset is re-valued with a new value.

Net assets are also known as “shareholder’s funds”, “shareholder’s equity” or simply “equity”.

The following example presents a sample balance sheet

Balance Sheet

As at 30th June 2002

Assets		
	Current Assets	
	Cash on deposit	25
	Accounts receivable	10
	Total Current Assets	35
	Non-Current Assets	
	Property, plant & equipment	200
	Patents	50
	Total Non-Current Assets	250
Total Assets		285
Liabilities		
	Current Liabilities	
	Bank Overdraft	12
	Accounts payable	5
	Provision for bad & doubtful debts	1
	Total Current Liabilities	18
	Non-Current Liabilities	
	Bank debt	125
	Total Non-Current Liabilities	125
Total Liabilities		143
Shareholder's Equity		142

Asset Revaluations

In general, assets that are purchased are placed on the balance sheet at their cost value.

Each period a depreciation expense is included in the profit-and-loss statement, while the value of the asset is reduced by the equivalent amount.

However, in some cases the value of an asset may rise or fall by significant amounts, and the value of the asset in the balance sheet may be changed.

This happens particularly with properties, investments such as holdings of shares, in with foreign assets or liabilities due to changes in the exchange rate.

The new valuation may be based on an independent valuation, a calculation such as a share price or currency exchange rate, or a "director's valuation" which is an estimate of the value made within the company.

In these cases, the value of the asset on the balance sheets is updated to reflect the new value.

(** check inclusion in P/L account)

2.1.6.2. Profit & Loss Statement

The profit and loss statement records the income and expenses that occurred during a period.

This includes all cash transactions, and also items reflecting the change in the value of fixed assets.

(** check accounting treatment of asset revaluations – p/l entry yes/no)

Depreciation is recorded as an expense, reflecting the reduction in the value of assets during the period.

Depreciation does not represent an actual cash transaction, and applies to the entire period, rather than a specific date.

Amortisation is a similar expense to depreciation, but applies to intangible assets such as goodwill, patents and licenses.

Where accrual accounting is used, the income and expenses will be included on the date that expense was used or the income was billed, rather than the dates that the cash payments were made.

The profit-and-loss statement can be presented in a variety of ways, however the following example presents one format

Profit & Loss Statement

1st July 2001 to 30th June 2002

Revenue	171
Operating Expenses	
Cost of goods sold	87
General and administrative expenses	17
Marketing and distribution expenses	14
Total Operating Expenses	119
Earnings before interest, tax, depreciation & amortisation	52
Depreciation	13
Amortisation	2
Earnings before interest & tax	37
Interest	3
Tax	12
Net Profit After Tax	22

“Revenue” is also referred to as “Sales” or “Income”.

This amount reflects the cash payments that were received by the business during the period.

The “cost of goods sold” figure includes raw materials, production costs, salaries and all expenses that relate directly to the goods produced.

The “general and administrative expenses” includes rent, salaries, and other administrative costs that relate to operating and managing the business and do not directly related to the volume of goods produced.

Although interest paid on debt is often a significant expense, a business may also receive small amounts of interest from cash deposits of working capital.

In these cases, the “net interest” figure is equal to the interest paid, minus the interest received.

In the general use of the word “interest” in the accounts and in analysis, this refers to interest paid on debt, not interest received.

The “net assets” figure of the balance sheet at the end of the period should equal the net assets figure at the beginning of the period, plus the net profit from the profit-and-loss statement.

Differences are due to equity capital raised or paid out by the business.

This includes dividends paid to shareholders, capital distributed from the business to shareholders, and new capital raised from investors to increase the assets within the business.

Raising or repaying debt may affect the total assets and total debts figures, but does not affect the net assets figure.

2.1.6.2.1. Depreciation

The “depreciation” expense is unique in several respects.

Depreciation is not a cash transaction, and does not represent and inflow or outflow of cash.

However, it does represent an outflow of value, due to the decrease in the value of the equipment.

This reduces the net assets figure, but not the cash balance.

Also, depreciation applies to a period of time, rather than a specific date.

Income, expenses, purchases and sales all represent transactions that occur on a particular date.

In contrast, depreciation refers to a decline in value that has occurred continuously over a particular period of time.

The total income and other items in the profit and loss account also apply over a period of time, however these items simply involve summing a range of individual transactions.

There are two views of the meaning of depreciation.

Accounting is concerned with bookkeeping, rather than recording true market values or value created or destroyed.

Under an accounting viewpoint, depreciation involves allocating the cost of an item of equipment across a number of periods.

For example, a piece of equipment may cost $50 and have a useful life of five years.

Under the accounting view, a straight-line depreciation amount of $10 per year is simply a way of allocating the cost of the equipment across the same periods that it is used for producing income.

This matches the income amount each year with the expense amount for the year.

Another view relates to the market value of the equipment.

Under this view, the depreciation is a record of the decline in the value of the equipment.

This is an expense, as it reflects a loss in the assets of the business.

Both views reflect similar results when the market value declines in approximately the same pattern as the depreciation schedule.

Calculating a depreciation expense

Depreciation may be calculated using a number of methods.

A “straight-line” depreciation approach allocates a constant depreciation expense to each period.

This is a simple approach, and may also have a benefit in producing consistent results across periods.

The depreciation expense for an asset can be calculated in this case using the following formula

$$\text{Depreciation} = \frac{\text{Cost of the asset}}{\text{Number of years of estimated useful life}}$$

Preparing accounts may involve adding the depreciation expense as an expense item, and reducing the value of that asset in the balance sheet by the amount of the depreciation expense.

Alternative methods may include a “declining balance” method, which reduces the value by a fixed percentage each period (** check), and a “sum of the years digits” method.

The sum-of-the-years-digits method involves adding each year in the useful life, and proportioning the asset value according to the year. (** check)

For example, in the case of an asset with a useful life of five years, the following figures may apply.

$$\text{Year 1 depreciation} = \text{asset cost} \times \frac{5}{1+2+3+4+5}$$

$$\text{Year 2 depreciation} = \text{asset cost} \times \frac{4}{1+2+3+4+5}$$

$$\text{Year 3 depreciation} = \text{asset cost} \times \frac{3}{1+2+3+4+5}$$

$$\text{Year 4 depreciation} = \text{asset cost} \times \frac{2}{1+2+3+4+5}$$

$$\text{Year 5 depreciation} = \text{asset cost} \times \frac{1}{1+2+3+4+5}$$

These alternative methods may allocate a larger proportion of the depreciation expense to early years than to later years.

This approach may result in a conservative asset value, with large asset value decreases occurring in early years, and may also reflect the market value of the asset more closely than a straight-line approach.

However, the straight-line approach may have a benefit of simplicity, and is also consistent from one period to the next.

2.1.6.2.2. Capital transactions

Capital transactions do not appear in the profit and loss statement, as they do not reflect an increase or decrease in shareholder's assets.

In the case of purchasing some equipment with cash, for example, the cash balance would decrease, the value of property, plant and equipment would increase, and the total assets would be unchanged.

In cases where a purchase was funded by debt, the value of the total assets would increase.

However, the value of the total liabilities would also increase by the same amount, and the net assets would not change.

In cases of equity being raised or capital distributions to shareholders, the net assets figure within the balance sheet will change.

However, this reflects the transfer of funds into or out of the business, rather than an increase or decrease in assets due to operations.

Capital transactions include the following items:

- Purchases and sales of property, equipment and other fixed assets.

- Payment of dividends.
- Raising and repaying debt.
- Raising equity and equity distributions to shareholders.

However, these items would appear in the cash flow statement, as they may involve transfers of cash.

2.1.6.3. Cash Flow Statement

The cash flow statement records cash transactions that occurred within the period.

This may be quite different to the profit-and-loss statement.

Capital transactions, such as equipment purchases, are included in the cash flow statement but not in the profit-and-loss statement.

In contrast, non-cash items such as depreciation are included in the profit-and-loss statement, but not in the cash flow statement.

The cash flow statement may appear in various forms.

One format groups the items into three categories.

These are:

Cash flow from operations	General income and expenses from the operation of the business.
Cash flow from investment activities	Capital transactions such as the purchase and sale of assets, development of new facilities etc.
Cash flow from fundraising activities	New debt raised, plus new equity raised, less debt repaid, less capital distributions to shareholders, less dividends paid.

In this context, "investment activities" relates to business investments such as constructing facilities, rather than financial investment such as purchasing shares.

Investment activities would include building new facilities and funding major projects.

The following example presents one possible format of a cash flow statement.

Statement of cash flows

30th June 2001 to 30th June 2002

Opening cash balance	74
Cash flows from operating activities	
Sales income	80
Payments to suppliers	(20)
Payments to employees	(25)
Building occupancy costs	(15)
Other operating cash flows	5
Total Cash flows from operating activities	25
Cash flows from investing activities	
Construction of new facilities	(47)
Total Cash flows from investing activities	(47)
Cash flows from funding activities	
Net debt raised	75
Net equity raised	(25)
Dividends paid	(10)
Total Cash flows from funding activities	40
Total cash flow	18
Closing cash balance	92

2.1.6.4. Statement of Capital Transfers

A statement of capital transfers is not a standard financial statement.

However, a statement of capital transfers may be useful in managing the business, and presenting a clear picture of the capital actions of the business during the previous period.

The standard financial statements of the balance sheet and profit-and-loss statement are built on the framework of accounting.

The major purpose of accounting is to record the holdings and transfers of assets.

While this is an essential part of business and is a useful input into business management, it may not always present information in a way that shows a clear picture of the business and its recent operations.

The three major financial statements have the following uses:

Balance Sheet	The financial structure of the business, and it's current holdings.
Profit and Loss Statement	The net income, profit or loss involved from operating the business. This information can be used to determine margins.
Cash Flow Statement	The flows of cash into and out of the business. This can be used in the management of cash flow.

A statement of capital transfers can be compiled using information the other three statements.

The balance sheets presents a static view at a certain period of time, while the other three statements present information regarding flows in the following ways:

Profit and loss statement	Flows of value to or from the shareholders.

Cash flow statement	Flows of cash.
Capital transfers statement	Flows of capital, including transfers of value from one form to another.

This could be presented in a number of ways. The following format is one example.

Statement of capital transfers

30th June 2001 to 20th June 2002

Item	Opening Value				Net Change	Closing Value
Assets						
		Plus Capital Expenditure	Less Depreciation	Less Sales of Prop, Plant & Equipment		
Property, Plant & Equipment	80	20	25	5	(10)	70
		Cash flow from operations	Net Capital Actions			
Cash	15	8	(2)		6	21
Other Assets	12				(3)	9
Total Assets	107				(7)	100
Liabilities						
Debt	30				(10)	20
Other Liabilities	4				2	6
Total Liabilities	34				(8)	26
		Plus Net Profit From Operations	Plus Net Equity Raised	Less Dividends Paid		
Shareholder's Equity	73	5	1	5	1	74

2.1.7. Accounting Issues

2.1.7.1. Capitalised Expenses

General expenses represent an outflow of value from the business. For example, payments made for rent represent a flow of value out of the business.

In the case of capital transfers, such as purchasing equipment, this represents a cash payment, but does not represent an outflow of value from the business, as the equipment comes into the business in place of the cash that has flowed out.

A similar issue can arise in other circumstances.

For example, expenses incurred in constructing a building do not represent an outflow from the business, because the completed building would have a value that would offset the cash that was spent.

In these cases, the payments would not be included in the profit and loss statement.

Instead, the payment amounts are added to the balance sheet as an asset.

This is known as capitalising expenses.

The asset would then be depreciated in the same way as assets that were purchased.

This enables the balance sheet to reflect the asset that has been created, and prevents the profit and loss statement from suggesting that large expenses were incurred, when in fact the payments were effectively a capital transfer, rather than a loss.

However, this is a controversial area.

Capitalising expenses reduces the expenses in the profit and loss account, and so this makes the profit appear to be higher than it would be if payments were expensed through the profit and loss account rather than being capitalised.

This approach accurately reflects the results of the activity when a genuine asset is created.

However, in some cases a wide range of expenses may be capitalised, ranging from advertising fees to interest payments, with the aim of making the profit appear to be larger than it actually was.

The purpose of this may be to increase the reported profit to make the business appear more attractive when offering the business for sale, dealing with banks, and dealing with investors.

In broad principle, capitalising expenses may accurately reflect the situation when the expenses lead directly to the creation of an identifiable asset that can be used to produce income, such as a building or a patentable product.

There is no clear-cut difference between capitalised payments and expenses, and a subjective decision must be made in each case.

A conservative approach may involve expensing all payments and avoiding capitalising expenses.

This approach may avoid including assets within the balance sheet that may have a questionable value, and may not be able to be sold.

In turn, this approach may place the business in a more secure position to withstand unexpected events.

However, in cases such as the construction of actual buildings, a capitalisation of expenses may be more suitable.

2.1.7.2. Accounts vs. Physical Holdings

In a basic financial management system, accounts may be kept that correspond to cash receipts and actual bank accounts.

However, in more complex systems, multiple accounts may be maintained that do not correspond to individual cash balances or bank accounts.

With funds set aside for specific purposes, for example, a fund may be maintained for maintenance expenses, while a separate fund is maintained for utility costs such as gas and electricity expenses.

These funds could be recorded as separate accounts, with credit and debit entries and even transfers from one account to the other.

However, both funds may be kept within a single bank account, with the bank account holding all transactions and balances that applied to both accounts.

Expenses are generally allocated to different accounts for reporting and management purposes.

For example, an account may be kept for refunds for damaged or returned items, while a separate account may be kept for payments to suppliers.

Both accounts may be maintained as separate accounts, although cheques may be drawn on a single bank account.

In this case, transactions from both accounts would all be processed through a single bank account.

Accounting systems can become extremely complex, with some large businesses maintaining thousands of accounts, including sub-accounts within major accounts.

Alternatives include maintaining a simple list of accounts, and tagging individual transactions with additional information for reporting purposes.

This arrangement allows for relatively simple balancing and reconciling of accounts.

This approach also allows the possibility of grouping transactions into categories to provide additional information about the break-up of expenses.

2.1.7.3. Other Accounting issues

Accounting is a complex area, and there are many issues that can result in the financial statements being quite different to the figures that would be expected from the underlying situation.

Accounting standards also vary from time to time and from place to place.

Book values

Assets are generally recorded at their cost price, rather than current market value.

Assets are recorded in the balance sheet at their book value. This is generally the cost price, less depreciation.

This may be quite different to the market value.

Depreciation methods use a straight-line formula over a fixed period of years, or one of an alternative set of methods.

"Going concern" basis

Financial statements are prepared under a "going concern" assumption.

This means entries are recorded on the basis of an operational business, not a static set of values.

For example, the liquidation value of many assets may be much lower than the values recorded in the balance sheet.

In the case of some intangible assets, such as a patent over a new production technology, this may be recorded as an asset to the operational business, although it may have no value if the business ceased to operate.

Also, assets such as a "future income tax benefit" are recorded in the balance sheet to reflect an overpayment or underpayment of tax, even though these items would not exist if the business ceased to operate on the current date.

Assets relating to future events, such as prepaid interest and "future income tax benefit" due to timing differences, may have zero value in the event of a liquidation.

Goodwill

The goodwill amount of an acquisition has questionable value, and in some analysis a more accurate picture may emerge by treating this figure as a cost of the purchase in the current year, rather than carrying it forward as an asset and expensing the amount in stages over several years.

Consolidated accounts

Consolidated accounts are used when several businesses are combined into a single entity.

In these cases, the assets and liabilities of each business are combined into a single set of accounts, to form a picture of the total enterprise.

Equity accounts

In the case of a partly-owned subsidiary, a pro-rata allocation of the individual assets and liabilities of the subsidiary may be consolidated into the balance sheet of the main company, to reflect the total assets and liabilities of the business.

On other cases, an "equity accounting" approach may be used.

This involves including the share ownership in the subsidiary as a single asset within the balance sheet, rather then using a consolidated accounts approach, where each individual asset and liability is included. (** check)

Foreign currency translation

Foreign currency transactions may occur when a business imports or exports goods, or conducts overseas operations.

In these cases, the foreign currency amounts are generally translated into local currency for inclusion in the balance sheet.

This translation may use an exchange rate that applied on the transaction date, an exchange rate on the balance date, an average rate through the year or some other figure.

Debt may also be raised in foreign currencies, and overseas assets may be owned.

In these cases, the value of the debts and assets are translated into local currencies on each balance date.

Moves in exchange rates may have dramatic effects on the balance sheets of companies in these cases.

Depending on the accounting approach used, this may also cause large swings in profit and loss due to changes in exchange rates.

Intangible assets

Intangible assets, such as patents, are difficult to value accurately.

The value of an intangible asset within the operating business may also be quite different to the value if the asset is sold.

"Abnormal" & "Extraordinary" items

Under some accounting regimes, items may be classified as ordinary items as part of the business operations, or unusual items.

These irregular items may be referred to as "abnormal" or "extraordinary" items.

For example, if a business owned a building for many years and then sold the building, the profit or loss on the sale would not be part of the normal business activities.

In this case, the item would be listed separately as abnormal or extraordinary item.

This would lead to additional entries in the profit-and-loss account, being the profit from business operations, before abnormal items, and net profit after abnormal items.

Signs and negative amounts

Accounting represents inflows, outflows and negative amounts using several conventions.

Negative amounts are usually presented in accounts using brackets, rather than a minus sign. For example, a net loss may be presented in the following way "Net profit (123)".

Positive values, without brackets, represent an amount of the relevant item.

For example, a positive figure listed under income would represent an inflow to the business, while a positive figure listed under expenses would represent an outflow.

Items are allocated according to the type of item, not according to whether the individual item is an inflow or outflow.

For example, an inflow due to timing differences in tax payments would be listed under expenses, as tax is an expense, regardless of the fact that the item was an inflow, not an outflow.

In this case, an entry such as “tax adjustment due to timing differences (10)” may appear, indicating that the item is an inflow.

This is a double-negative, as a negative expense represents a positive inflow.

Items are also presented using the terms “increase” and “decrease”.

In these cases, a positive amount has the same sign as the item description, while a negative amount has the opposite sign.

For example, “net increase in working capital (12)” would represent a decrease in working capital, as the sign of the item reverses the description.

A result of these conventions is that the total of a column of figures cannot be calculated by simply adding the figures together.

The sign of each item must be determined individually, and either added to the total or subtracted from the total.

In general, a positive figure follows the description of the item, so that a positive income item is an inflow, a positive expense is an outflow, and a positive “increase” amount represents an increase in the size of the item.

Figures in brackets reverse the natural direction of the item.

2.1.8. Bookkeeping & Accounting Terms

Account	A holding of monetary value. Value is added to the account or removed from the account using credit and debit entries.
Cash book	A record of cash received for each day of operation.
Chart of accounts	A list of the accounts maintained within an accounting system.
Credit	An entry in an account that records a reduction in the value of the account.
Debit	An entry in an account that records an increase in the value of an account.
Depreciation	An expense reflecting the reduction in the value of an asset over time. This expense represents a reduction in value and a reduction in net assets, but does not involve a cash transaction.
Double-entry bookkeeping	A system under which transactions are recorded as two entries, as a debit (added value) to one account, and a credit (removed value) to another account.
Float	A temporary cash balance maintained to allow for differences in timing between cash inflow and cash outflow.
General ledger	A set of accounts.
Invoice	A statement that services have been performed or goods delivered, and requesting payment.
Journal entry	An entry within an account, such as a credit or debit entry. (**check).
Ledger	An account, containing credit and debit entries (**check).
Post a transaction	To create a transaction and add it to an account.
Raise a transaction	To create a transaction and add it to an account, or issue an invoice.
Raise funds	To borrow funds, or to source funds from investors.
Receipt	A record acknowledging that payment

	has been received.
Reconciliation	To compare and balance account values and transaction lists from different information systems and sources, such as internal accounting records and bank statements. Differences may arise due to keying errors, lost or missing items, software bugs, miss-interpreted information and timing differences in posting to different data sources.
Straight-line depreciation	A method of calculating depreciation, in which the asset value is divided by the number of years of expected useful life. This may produces a figure that may be used as a constant depreciation figure in each year.
Suspense account	An account use for temporary holding of items in dispute or items involving processing problems (**check).
Transaction	A record of a transfer of funds. In the double-entry system this would correspond to two journal entries, a credit within one account and a debit within another account. In the more general sense, a transaction is a record of an exchange of goods, or a transfer into or out of an account.
Trial balance	An attempted balance between different accounts, including different processing systems and information sources. Accounts do not generally balance at the first attempt, and considerable time and effort may be involved in locating and correcting errors and missing items.
Write off	To remove an asset that has been lost, and include an expense transaction to record the loss.

2.1.9. Financial Statement Terms

"Going concern"	The technical accounting term for the fact that financial statements are prepared under an assumption of an operational business. For example, income that is due for receipt in a future period is included in the balance sheet.
Accounts payable	Payments that are due but have not yet been made. This is recorded as a liability.
Accounts receivable	Payments that are due from clients or customers but have not yet been received. This is recorded as an asset.
Amortisation	An expense that records a decline in the value of an intangible asset, such as a patent with a limited period of operation.
Asset	An item that has monetary value. This includes tangible items such a land, buildings and equipment. Some intangible items are also recorded as assets, such as the value of a licence or patent. Debts owed to the business are also listed as assets.
Bad and doubtful debts	A debt that has passed the due date without payment having been received. Various credit recovery steps may be taken, with some debts never being recovered, and written off as an expense.
Balance sheet	A statement of the assets, liabilities, and net assets of the business at a point in time.
Capital expenditure	Funds spent on large, long-term items such as equipment, buildings, and development of new facilities, as opposed to operating expenses which are part of the regular operation of the business.
Cash flow statement	A statement of cash payments received and made by the business. The may be grouped into operating cash flow (general income and expenses), investment cash flow (sale and purchase of major assets), and funding cash flow (debt and equity raised or repaid).
Consolidated accounts	Accounts prepared as a combination of the assets and liabilities of several related business, combined into a single balance

	sheet and profit-and-loss statement.
Contingent liability	A liability that may or may not be due, depending on a future event. A claim against a business that is currently progressing in a court case is a contingent liability.
Current	Within a one-year period. This concept relates to short-term items. A bank overdraft is a current liability, as it is technically repayable on call, even though it may have a long-term balance as part of ongoing operations.
Debt	Funds borrowed from banks or investors.
Depreciation	An expense that records a decline in net assets over the period, due to a reduction in the value of an asset such as equipment.
EBIT	Earnings Before Interest and Tax. This is the operating profit of the business, before payment of funding costs relating to interest.
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation. This is the net cash flow of the business, and is the operating profit before deducting depreciation and interest costs.
Equity	Ownership of assets. The assets of a business are owned by the shareholders or owners of the business. Also used in the context of raising funds from investors for use within a business.
Equity accounts	Accounts which record the investment in another business as an investment asset on the balance sheet, as opposed to consolidated accounts which include each individual asset and liability within the consolidated balance sheet. (**check)
Expense	Payments made by the business in the normal course of operations. This does not include payments made for capital purposes, such as purchases of equipment and dividend payments.
Future income tax benefit	An asset due to timing differences between accounting entries and tax calculations, which would reduce future tax payments.

Goodwill	The excess price paid when purchasing a business above the value of the business's net assets. This may represent the value of the regular operations of the business as a going concern, or it may be a cost paid for strategic reasons such as entry into a market. Goodwill is recorded as an intangible asset on the balance sheet, and amortised over a period of time.
Income	Payments received by the business. This does not include payments received due to a capital transfer, such as the sale of a property.
Intangible asset	An asset with monetary value but without physical form. This includes patents, trade marks, media mastheads and goodwill on acquisition.
Liability	An amount owed by the business. This includes debts, and amounts due for other reasons such as settlement of court cases and funds set aside for specific purposes.
Loss	A reduction in the net assets of a business due to operations (rather than due to capital events such as capital distribution to shareholders)
Masthead	The name of a newspaper. A masthead can have considerable value, and is recorded in the accounts as an intangible asset.
Net assets	The excess value of assets above liabilities. This is the value of the business as a static holding, and in concept this would be the amount remaining if all assets were sold and all debts repaid.
Net income	Net profit
Net profit	The excess of income above expense items. This includes non-cash expenses such as depreciation, which records a reduction in value due to the decline in the value of equipment. Net profit is the change in equity funds due to the operation of the business. (** check p/l treatment of asset revaluations)
Non-current	Relating to long-term items, specifically items that would normally trade over periods that were longer than one year.

NPAT	Net Profit After Tax. This is the net profit of the business.
Operating cash flow	Cash flow due to business operations, the excess of income above operating expenses. This does not include cash transfers of a capital nature such as raising new debt, repaying debts, dividend payments etc.
Patent	A license issued by a government authority giving the developer of an invention the exclusive right to use the invention for a period of time. For example, a patent granted to an inventor of a product would allow the inventor to manufacture or licence the product for a period of, for example, 20 years, without others copying and using the invention. At the end of the patent term, these rights expire and the invention becomes part of the public domain (** check patent term).
Profit	An increase in the assets of the business due to operations (rather than capital transfers such as raising additional funds from investors).
Profit-and-loss account	A record of the transactions that occurred during a period, including income, expenses, and non-cash changes in value such as depreciation.
Pro-forma financial statements	Statements prepared to represent a possible situation, rather than an historical event. For example, a prospectus to float a business, a joint venture proposal, or accounts modified for analysis purposes may include pro-forma accounts listing the financial statements as they would appear after the event.
Provision	A liability that records an amount set aside for a specific purpose. For example, a provision is generally included for bad debts, where a certain percentage of payments due are never recovered.
Revenue	Income received from clients and customers.
Sales	Payments received for the sale of goods to customers, or delivery of services to clients.
Shareholder's funds,	The net assets of the business.

Shareholder's equity	
Tangible asset	An asset with physical form, such as land, buildings and equipment.
Trade creditors	Amounts owed to suppliers.
Trade debtors	Amounts due from customers.
Trade mark	A brand name, business logo or other item that represents a brand. If a licensed trade mark is copied or impersonated by another party, the owner of the trade mark can take legal action to recover the lost value.

2.2. Law

2.2.1. The nature of law

A law is a description of a cause-and-effect.

The law of gravity, for example, is a mathematical relation describing the forces between objects due to gravity.

The law of supply and demand describes the effect that prices will rise when demand is high and supply is low, and fall when demand is low and supply is high.

The laws within a society describe an understanding or written rule, that a certain action will be taken when a situation arises or a specific action is performed.

Murder, for example, is commonly forbidden within societies.

The law against murder describes a rule that, should a murder be performed, action will be taken.

This action may result in arrest, trial and imprisonment, or some other penalty.

2.2.2. Law in various situations

Within a wilderness situation containing separate individuals, law does not exist.

Actions are taken, and responses come forth.

Animals hunt food using speed and stealth.

Hunted animals escape predators using speed, defences, camouflage, and responding with attack.

In nature, and in wilderness situations, penalties are not applied to other creatures.

Each creature approaches other creatures under certain circumstances, and may by met with an attack, flight or other response.

Within social groups of both people and animals, several situations may exist.

In some cases, individuals are widely dispersed, and there is no authority or control.

In this situation, laws may be described as the common response to particular events.

For example, an attempt to steal items from an individual or group may result in an aggressive response.

Although this would not be a law in the traditional sense, these responses would describe the commonly existing cause and effect of actions.

These situations could be described as responses, rather than laws, due to the fact that no person would be in a position to impose a penalty on another person by force.

Laws generally exist in a social group that remains in close contract.

The law is determined by the individual or group that is in control of activity within the entire group.

Within tribal groups, this may be a dominant leader, who holds authority and has the ability to cause actions to be taken

Alternatively, a council of elders may pass judgement and order penalties to be applied.

2.2.3. The history of law

The source of modern law can be traced back several thousand years.

In western societies, the judgements of Solomon and the laws of Moses laid down many of the principles that modern law is based on.

In Islamic countries, the Koran is a major source of law.

In some societies, the laws of the Koran are applied rigorously, while in other societies a secular, non-religious legal system applies.

(** law in various cultures/countries)

2.2.4. Law and Religion

Modern law is closed tied with religion.

The principles of the law in many societies are based on religious writings and principles.

In some countries, the law is determined directly from religious writings, and judgements are made in religious courts by priests or other religious authorities who interpret and apply the laws.

In other societies, religious courts and secular courts operate concurrently.

The religious court may deal with issues regarding religious law, while the secular court may deal with commercial disputes and other issues.

In other societies a secular legal system applies, although in these cases the principles applied are often founded in religious history.

2.2.5. Legal Systems

Legal situations arise in two basic categories.

Criminal & civil law

Criminal law applies to actions taken against an individual, in response to an action being performed.

Murder and theft are commonly forbidden, and action is taken against individuals who perform these acts.

In the case of criminal law, action is taken by society in general, also referred to as the state.

Civil law applies to disputes between two individuals.

For example, a product may be delivered to a customer.

The customer may refuse payment, claiming that the product was not the product that was requested.

This dispute would then be taken to a court, which would pass judgement on the situation, and order payment from one party to the other as compensation for any loss incurred.

Trial systems

Several approaches may be used to conducting trails, depending on the particular legal system.

The adversarial system views a court case as a contest between the two parties.

The two parties sit side-by side in the court room.

The judge controls the trial process and rules on technical issues, while the two parties present their cases to the jury.

The jury then passes judgement.

In some situations, only a judge or panel of judges hears a case, rather than a jury.

The adversarial system is used in the United States.

The inquisitional system places the accused under examination.

The accused sits in the dock, under examination by the judge and jury.

This inquisitional system is used in some Asian countries.

English law, on which Australian law is based, uses a system that contains elements of both an inquisitional and an adversarial system.

In the English law tradition, the accused sits in the dock, and is effectively placed under examination in a similar way to the inquisitional system.

However, unlike the inquisitional system, the accused is not questioned directly by a judge or jury.

2.2.6. The law in practice

Disputes in commercial transactions are common, and court cases involving commercial disputes are a common event in business activity.

In practice, however, the law often has limited use in a situation of loss.

Court cases can take months or years, and involve large sums of money and time.

If the case is lost, a large payment to the other party may result.

Winning the case may involve a refund of the funds that were lost.

However, this may not compensate for the time spent, the delay in recovering the funds, and other costs involved.

In the case of small transactions, the use of legal action may simply be impractical.

In many cases a business's involvement with the legal system may come about through being a defendant to legal action initiated by another party.

In practice, the person with physical possession of an item may hold a great advantage.

For another party to gain possession of an item through the legal system may involve a great deal of time, cost, and an uncertain outcome.

For example, goods may be delivered, and then payment may be refused.

In this case, the customer has physical possession of both the goods and the funds.

The customer then has the full use of the goods and the funds for the duration of any court case, which may take months or even years.

The supplier, in contrast, has neither the goods nor the funds, and must pay the legal costs until the case is complete.

In the opposite case, payment may be made in advance, however the goods may not the delivered.

In this case, the supplier has physical possession and benefit of both the goods and the funds.

Problems such as these can be reduced when trading takes place on the basis of physical possession and exchange, rather than legal rights and obligations.

In the case of small transactions, this may involve exchanging the payment and the item during the same exchange.

In the case of larger transactions, funds can be held in a trustee's name in an escrow account, to enable the exchange to be made without the risk of the business loosing both the funds and the item.

In many cases, the legal system may be a distant back-up to exchange based on physical possession.

2.2.7. The development of Australian law

Australian law is based on the history of English law, which traces back to the (** check century) century.

Originally, the term "court", in the sense "court of law", arose from the court of the king.

This was the place and situation in which the ruler at the time gave instructions and orders to be performed.

Disputes between individuals were brought before the king, who passed judgement and ordered action to be taken.

Over time these individual judgements developed into a set of principles and laws.

As the population expanded, it no longer became practical to bring every individual dispute before the ruling monarch.

Local courts were established and judgements made by appointed judges or local lords or barons (**check timing of judges vs. rulers)

Common law

These judgments developed into a set of principles known as common law.

These laws are not written explicitly, but are the general principles that have arisen from a range of different cases and judgements.

The history of English law also includes a period in which two separate court systems were in operation.

These gave rise to the common law, and the law of equity.

A single court system has operated in modern times, and the common law of today draws on the judgements of all previous cases.

Precedent

The legal system operates on the principle of precedent.

This states that the principles emerging from previous cases and judgements are binding, and form laws that must be applied when new cases are heard.

Statutory law

Statutory law is law that is written as explicit actions in response to specific events.

Originally written law included statements and laws declared by the king.

The development of patents for inventions traces back to declarations made by (** check date).

Within democratic societies, the law is written by parliament.

Bills are presented to the houses of parliament, voted on, and become law if the vote is favourable.

Statutory law overrides precedent within the common law from previous court cases, in situations in which a statutory law may alter or reverse an existing common law principle.

Structure of the legal system

The legal system operates independently of the political system.

(** appointment of judges, election/nomination etc)

Laws passed by parliament are applied by judges in hearing court cases.

In situations were written laws are not available, precedent and the common law is used.

Criminal law applies to an action by the state against an individual.

This applies to a range of actions that are declared to be criminal offences.

Within a criminal law case, guilt must be established beyond reasonable doubt.

Civil law applies to disputes between two parties.

Within a civil law case, the burden of proof is lower, and the decision is made on the balance of evidence.

2.2.8. Legal Concepts

The law recognises a number of different concepts.

These include property rights, contract, injury, debt, agency, and property held on trust.

2.2.8.1. Property rights

Most non-communist countries recognise the concept of property rights.

This means that a person can own property, and will then posses certain rights which are enforced by the law.

The legal use of the word “property” applies to anything that is owned.

This is not restricted to land and buildings.

For example, a piece of equipment that is owned by a business is considered an item of property using the financial and legal use of the term.

Property includes land and buildings, equipment and other physical objects, rights to receive payment such as money due from borrowers, intangible property such as patents and licenses, and cash.

In a wilderness situation, for example, property applies to land and items that can be physically defended against external actions.

In a society that recognises property rights, physical defence of an area is not necessary.

A building can be owned on the opposite side of the world, and action will be taken by the society if the building is damaged or broken into.

Trading

Property can be traded for other property.

In each case, ownership of the property passes to the receiving party.

In most transactions, one item is a sum of money, while the other item is a service or an item of property.

Lending

Property can also be loaned to other parties.

In these cases, various situations apply.

The owner of the property retains ownership of the property, however the borrower also has certain legal rights.

For example, a tenant renting premises has the legal right to full use of the premises, and the owner cannot enter without giving proper notice and following certain steps.

Property that is loaned may be due for return on request, after a fixed period of time, or under other conditions.

Lease or rent payments may be made in exchange for the use of the property for a period of time.

Gifts

Property can be given as a gift, in which case ownership of the property passes to the recipient.

A gift is not a contract, as this is a one-sided transaction and payment is not involved.

However, once the gift occurs, the ownership changes into the name of the receiving party.

This can be formalised in a deed of gift, which is similar to a trust deed regarding property held on trust, and declares in writing that the event has occurred.

Gifting is used in commercial situations to transfer property into alternative vehicles.

For example, a joint venture may be established using a trust arrangement, with the assets used to fund the venture being gifted into the trust at the commencement of the enterprise.

2.2.8.2. Contract

A contract is an agreement between two parties.

This agreement generally involves the transfer of goods or services, and must include compensation of some kind in order to be a legally enforceable contract.

2.2.8.2.1. Requirements

A contract requires the following steps to be legally enforceable

1. Capacity
2. An Offer
3. An Acceptance
4. Consideration
5. Intention to form legal relations

2.2.8.2.1.1. Capacity

Capacity requires that the party agreeing to the contract is able to do so.

In general any individual or company is assumed to have capacity.

However, a contract may not be binding in cases of mental incapacity, drunkenness, contracts with minors, or in cases of duress where intimidation is used.

2.2.8.2.1.2. Offer & Acceptance

An offer is a statement that an offer to conduct a transaction is being made, and clearly specifying the terms of the offer.

Acceptance is a clear statement that the offer is accepted.

When acceptance is given, the contract comes into existence at that point in time.

A counteroffer is considered to be a separate offer, made towards the other party.

A discussion or negotiation has no legal effect.

A contract cannot be formed until a clear statement is made that an offer is being put forward, the terms of the offer are specified, and a clear statement of acceptance is given.

Verbal contracts

There is no requirement in general for a contract to be in writing or to be signed.

A verbal contract is equally binding, as long as a clear offer and acceptance has occurred.

In some particular cases, such as the sale of land (** check), a contract must be written to be valid.

In general, verbal contracts are legally binding, as long as a clear offer and a clear acceptance have been given.

For example, an order of a product through a telephone call may form a contract between the customer and the business, even though no written documentation is involved, and no documents are signed.

However, verbal agreements are very difficult to prove.

In practice, a written and signed document is necessary before the business could consider that a contract was in place.

Implied acceptance

Acceptance can also be implied by an action, rather than being an explicit statement.

For example, if an offer was made for payment for a building activity, and the building activity was started, then this may be interpreted by a court as an implied acceptance of the offer.

This would form a binding contract, even through a statement of acceptance may not have been made.

Discussions and "invitations to treat"

Advertising and general discussions are known as an "invitation to treat", and are not considered an offer.

Withdrawing offers

An offer may be withdrawn at any time before acceptance is given.

However, once acceptance has been clearly given, neither party can withdraw from the contract without the consent of the other party.

Once acceptance is given, both parties are bound by the contract, and cannot withdraw from the contract without the other party's consent.

Exchanges in practice

In the case of smaller exchanges, verbal agreement may be taken to suggest that the other party may appear on the settlement day with the item or the funds.

If the other party appears, then an exchange is made, otherwise the arrangement lapses.

In the strict legal sense, a contract is created when the other party gives verbal agreement to the terms.

In the practical case of many transactions, however, physical exchange of the items is the only action that causes a change in ownership to occur.

2.2.8.2.1.3. Consideration

Consideration is anything of value that is provided in exchange for the item.

This may include a cash payment, another item in return, or a service to be performed.

An agreement to supply a gift is not a contract, and a contract is not valid unless some consideration is provided in return for the item.

In some cases action can be taken if promises are made, the promises are not kept, and damage is suffered as a result of relying on the promises.

However, this action is not taken under contract law.

This situation is known as promissory estoppel.
(** check details)

Promissory estoppel appears rarely in commercial law.

In general, the requirements of contract law specify the conditions that are necessary to form a legally binding agreement between two parties.

A court does not asses the value of the consideration.

There is no requirement that the consideration have similar value to the item according to any particular measure.

A sale of a large property for one dollar would be a legally enforceable contract, assuming that all other requirements were in place.

A nominal fee is sometimes known as a “peppercorn rental”, in reference to a famous case in English law in (**check date).

In this case, a property was leased for a rent of one peppercorn per year.

The court held that this was a valid contract, as the decision to enter the contract was a decision to be made by the parties, not a decision to be made by the court.

Nominal fees such as a one dollar license fee are sometimes used in cases where the intention is to allow usage without charge.

However, without the nominal fee, contract law would not be triggered and would not apply, as contract law does not apply to gifts or situations in which consideration is not involved.

2.2.8.2.1.4. Intention to create legal arrangements

A contract is only enforceable when there is a clear intention to create legal relations.

In other terms, the parties must intend to enter a binding agreement.

Agreements in domestic and personal situations are not legally enforceable contracts.

2.2.8.2.1.5. Other contract issues

A range of other minor issues apply.

Mistake

For example, a contract to commit a crime is not a legally binding contract, while a contract that contains a mistake, such as a typing error in an account number, is not held to the literal text.

In this context, however, “mistake” does not include regret or poor judgement, but applies to situations where a clear misunderstanding has occurred.

For example, if an incorrect item was demonstrated to a person and they signed a contract of purchase, this contract may not be binding, as the item shown was not the item that they believed that they were purchasing.

The term "mistake" is applied extremely strictly, and this situation is usually only applied to cases where a clear error was made, such as a typing mistake or displaying the wrong item.

The legal term in this case is that there must be a "meeting of minds" in order for a contract to be formed.

In other words, both parties must have the same clear mental understanding of the agreement that they are making.

However, the basic principle of contract law is that the law will enforce the right of a party to rely on statements and agreements made by the other party.

Great care and consideration should be given before signing any document or agreement.

Under contract law, the other party is entitled to proceed with the terms of the contract as soon as agreement is given.

If a party signs a contract and then fails to perform the actions that are listed in the contract, the other party can then sue them to recover a loss that they have incurred.

In some cases, issues may arise if an agent, director or other party acts in contradiction to instructions, or outside the limits of the authority that was granted, in signing a contract.

In general, a party to a contract is entitled to assume that the other party has capacity and authority to perform the act that they perform by signing a contract.

These situations may be complex, but one scenario would be that the contract remains binding, while the person who appointed the agent then sues the agent for breach of trust to recover their loss.

Fulfilment of a contract

A contract is extinguished when the actions specified in the contract are performed.

For example, an item may be offered for sale at a certain price.

A buyer may then accept the offer.

At this point, a contract appears, and the buyer is legally obligated to deliver payment, and the seller is legally obligated to deliver the item.

When the item and the payment are exchanged, the actions within the agreement have been fulfilled, and the contract dissolves.

In practical situations, such as purchasing an item within a shop, these events occur legally, although common practice involves selecting an item and making payment, rather that stating an offer and an acceptance.

The purpose of a contract is to enable a party to recover a loss that is caused by the other party not fulfilling their required actions under the contract.

Commonly, a contract applies to supplying a product or service in exchange for a payment.

If a product is supplied and payment is not made, then this is a breach of the contract by the customer.

The supplier could then initiate a legal action against the customer.

In a clear case, the court would then recognise the contract and order that the customer make the required payment.

In common situations such as buying and selling, no written documentation is needed to establish that a contract is in place, and that payment should be made or that goods should be delivered.

A party that refuses to comply with a court order may be subject to fines and ultimately imprisonment.

A contract can also be dissolved by both parties agreeing to walk away from the agreement.

Misrepresentation and Negligent Misstatement

In general, a contract can be assumed to be legally binding, unless some particular circumstances are in place.

“Misrepresentation” applies when the other party makes false statements in discussions before the contract was agreed.

This may include statements of fact that were not accurate.

Also, in some cases, misrepresentation can occur by omission.

This may occur when the other party clearly has made an assumption regarding a question of fact that is incorrect, and the other party remains silent and fails to correct the misunderstanding.

For example, in the sale of a restaurant, the buyer may comment on the large number of external tables available for customers.

However, if some of the tables were associated with the adjoining restaurant, rather than with the restaurant for sale, and the seller remained silent and did not correct this clearly mistaken belief, then this may be a misrepresentation by omission.

In general a seller or other party to a contract does not face any requirements to make statements or supply information.

The other party may ask questions, and the seller may provide answers, or decline to answer the question.

The buyer must then make their decision based on the information available to them.

Misrepresentation applies when a false statement is made, on in exceptional circumstances, where a statement is not made to correct a clearly mistaken assumption.

In cases of misrepresentation, a contract may not be binding.

“Negligent misstatement” occurs when a party recklessly makes statements without sufficient basis for knowing whether they are true or not.

This may not be based on deliberate false statements.

In other cases, the information may be correct or incorrect, without the party having a sufficient basis to put forward the statements as being accurate.

In this case, if the statements later turn out to be incorrect, and the other party suffers a loss due to this, then the contract may not be binding, due to the negligent statements.

Unsolicited goods and services

Unsolicited goods and services involve delivering goods or performing services that the customer has not requested.

In this situation, the customer does not have an obligation to pay for the product or service.

For example, an item may be sent to a customer's address without the customer requesting the item.

An invoice may later be sent requesting payment.

In this situation, no contract is in place, as an offer was not given and acceptance was not supplied.

The customer would be under no obligation to pay for the product, or take steps to return the product to the sender.

However, ownership of the property may remain with the sender, and the customer may not have the right to retain the item if the sender attempted to retrieve it.

If a period of time had passed, however, ownership of the item may be said to have passed into the hands of the customer.

This may particularly apply if no communication was involved for an extended period of time and the customer put the item to some practical use.

However, this is an example of a situation where the law does not have clear operation, and the individual circumstances of each case may be considered.

A more complex situation arises when a service has been performed or a product has been created, and the situation cannot be reversed.

In a simple example, a person may mow the lawn of a customer without the customer's knowledge, and then demand payment.

The service would already have been performed, and could not be undone.

In another example, a large item may be ordered by a customer, and additional features may be added without the customer having requested them.

In both these cases, the customer has an obligation pay only for the parts of the product, or any service, that they actually requested.

A hair cut is another example of a service.

A hairdresser would not normally cut the hair of a client without first confirming that the style of cut was the style that the client actually wanted.

In some cases, the customer may also be able to take action against the supplier, for performing a service that the customer did not want, and that cannot be reversed.

This may involve legal action under trespass, which relates to accessing or altering property of a person without their consent.

In some circumstances, providing unsolicited products and services is prohibited under the commercial law, and may attract penalties.

In some cases, unsolicited services are little more than a form of extortion.

This involves performing a service without the client's knowledge or consent, and then demanding payment, in the full knowledge that many potential clients would say no if offered the service in advance.

In other cases, an assumption may be made that a customer may want a particular product or service, and the product may be created or the service performed without the customer's knowledge or consent.

This should not occur for two reasons.

First, the assumption may be wrong, and the customer may not actually want the goods.

More importantly, the decision to select a service or item is a decision to be made by the customer, not by anyone else, and the business or any other party does not have a right to proceed without the knowledge of the customer and consent being given.

In general a business should not deliver goods or perform a service unless a clear request has been made by the customer or client.

2.2.8.3. Physical possession

The law does not recognise physical possession of an item as being ownership of the item.

Under the law, physical possession and ownership are two separate concepts.

For example, an item of equipment may accidentally be shipped to the wrong address.

In this case, the receiver would have no legal basis to claim ownership of the item, and ownership of the item would remain with the sender.

In this situation, a court would normally order that the receiver hand the item over to the sender if they attempted to retrieve it.

However, there is a legal principle known as (** check name), that suggests that ownership of an item may pass into the hands of a person having physical possession, when a long period of time has passed and clear legal arrangements are not in place.

For example, the fence line between two properties may be incorrectly marked.

The properties on each side of the fence may be bought and sold many times, with the value of each property assuming that the fence marker was correct.

If the error was discovered at a future date, a court may order that the existing fence position becomes the effective ownership of the property boundary.

This principle is used rarely, and has generally been applied to land boundaries, where the original boundaries are many decades, or hundreds of years, out-of-date.

This would not apply to cases where regular payments were involved, such as rent or interest, or where clear arrangements were in place, such as trust deeds.

In these cases, an arrangement can continue for hundreds of years without change.

It would also not apply where an item was loaned from one person to another, where possession was deliberately taken, or to commercial transactions.

This principle only applies in cases where an item comes into a person's possession through the natural course of events.

An example would be items that were left in a property after the previous tenants or owners had vacated.

Ownership of items generally remains with the original owner.

However, in some cases this may pass to the persons having possession of the item if an extended period of time has gone by.

In the earlier example, if the item arrived at an incorrect address and remained there for a long period of time, ownership may be declared to have passed to the receiver.

For example, a period of many months may pass, after which the receiver may put the item to practical use, such as incorporating it into a building construction.

After this time, a court may order that the sender had lost their right to retrieve the item, due to the extended period of time that had passed.

Another example may involve items that remained in a building for an extended period of time after the previous tenants or building owner had vacated the building.

In general, however, physical possession does not affect ownership, and the ownership of an item only changes when it is bought, sold or given as a gift, regardless of its physical location.

Care should be taken to ensure that this issue does not arise against the intention of the business.

For example, in some cases, parties have seized items by force, held them for a period of time, and a legal issue has arisen with the possibility of the ownership being declared in favour of the holders.

This can be a particular problem with vacant buildings, where in some cases legal action has been taken against the owner of the building in an attempt to gain ownership of the building by parties taking physical possession of the building.

The risk of this situation occurring can be reduced by ensuring that documentation is in place for all loans of physical items, and that in cases

where property is seized by force, steps are taken to recover the items within the shortest practical period of time.

2.2.8.4. Practical contract issues

The terms “agreement” and “contract” have the same meaning.

Any agreement that is signed involving products or services will generally form a legal contract.

This includes some of the following situations:

- Being an employee or an employer.
- Purchasing or selling a product.
- Being a client of a commercial organisation based on a regular fee, such as a telephone connection.

Reading contracts

In some cases, reading the full details of a contract may not be practical.

For example, when a small item is purchased in a shop for cash, a receipt may contain a large number of conditions listed as details of the arrangement.

Signing the receipt forms a contract, however this contract is generally extinguished as soon as the exchange of cash for the product is made.

Some individuals may take an attitude that reading a contract is a sign of distrust, and that this is a personal insult.

However, in signing a contract, a person becomes bound by the full force of the law.

Reading a contract before signing it is a basic formality.

In many cases a person taking this attitude is effectively asking the other party to place their life in the hands of a complete stranger.

Regardless of this issue, the other party must usually determine what the terms of the contract actually are, and this cannot be determined without reading it.

In this respect, reading the document involves finding out what the terms of the contract actually are, regardless of other issues.

In general, every word of a contract or agreement should be read before it is signed.

Under the law, this burden remains with the person who signs the contract, and the other party is entitled to assume that the person will perform the actions that they have agreed to by signing the contract.

Large transactions

In the case of large transactions, such as the sale of an airport, the contract is generally developed in one of two possible ways.

In some cases, meetings are arranged where the two parties sit in conference and discuss and argue the different points to be included in the contract.

This may be an intense and tiring process, with the final result having large implications for both parties.

This process may continue for several days, or in some cases for several weeks.

In other cases, a broad contract is proposed by one party. This is then sent to the other party for consideration.

In some cases, hundreds of pages of trust deeds, schedules, and actions to be taken under a wide variety of circumstances may be listed.

The other party would then review this contract, make a large number of small additions and deletions, and then send the contract back to the original party several weeks later.

The first party would then accept or reject the individual changes, and make additional changes.

This process may continue with several revisions of the contract being made, including discussions over various points, until agreement was reached to accept the current contract as it stood.

Some of the items that can be included in a large and detailed contract include the following points:

- Schedules of payments to be made.
- Lists of maintenance items, timeframes and costs.
- Detailed descriptions of the items, such as land surveys and equipment lists.
- Events of default – a list of events that will lead to action, such as failing to meet payments, failing to provide services according to the agreed schedules and so on. For each default event, the action is specified, such as penalty interest payments, or appointing an alternative supplier.
- Service level agreements, specifying the type of services provided, the response times for each service, and the fees involved.
- Details of payment arrangements such as escrow accounts, payment instalments, and cash flow directed from the project into specific accounts to meet specific purposes such as debt repayments.
- Details of funding arrangements, such as payments to be made on debts or to investors, and the timing and conditions under which payments will be made.

Large contracts such as this follow the same legal structure of offer and acceptance as any other contract, and use the same trust arrangements when trustees and trust deeds are involved.

Standard products and services

In the case of purchasing standard products and services, in practice the business does not have the option to alter the contract.

The contract must be accepted or rejected as it stands.

However, there are two reasons for carefully reading and considering the contract.

First, an item in the contract may be surprising and unexpected, and this may alter the business's decision to purchase the product or select the service.

In some cases, a different service or type of product may be selected from the same supplier, or a different supplier may be selected.

Second, being aware of the conditions in the contract may alter the current or future actions of the business.

For example, a mobile telephone contract may have a minimum term of operation, before the contract can be terminated without penalty.

This arrangement is generally used when the business incurs a loss in the early part of the contract, and the early termination penalty is included to reduce or eliminate the loss due to early termination of the agreement.

In the mobile telephone example, the business would fund the cost of the telephone directly and generate an initial loss, which may be recovered through regular payments over a period of time.

Being aware of the minimum term, termination penalty and other issues may not affect the decision to purchase a product or select a service, however this information may be important in making other decisions at the same time or at future times.

A business that has signed contracts without knowing the contents may become highly vulnerable, and may also loose the ability to act without incurring unexpected losses.

Without knowing the contents of the agreement that they are bound by, the business cannot make free decisions.

A decision may or may not lead to a loss, and the business will have no way of knowing whether a particular act will lead to a problem or not.

The telephone example also illustrates this.

Not being aware of the conditions, the business may select a new telephone supplier, intending to cancel the previous one.

However, after signing an agreement with the second supplier, the business then discovers that a termination penalty applies to the first contract.

The second contract may also contain a termination penalty.

In this situation, the only alternatives may be to pay the termination penalty, or pay for both services until the one of the contracts expired.

Some contracts use various legal terms, however the key facts can generally be determined from reading the document itself.

Verbal contracts

In general, verbal contracts in a commercial setting form legally binding contracts.

For example, if a customer was to order a product by telephone, then this would form a contract between the supplier and the customer.

In some cases, a request to cancel a product order may be accepted if it is given at an early stage.

In general, however, once a verbal order has been placed this forms a contract, and delivery would proceed and the customer would be legally obligated to pay for the product.

Many businesses avoid the possibility of bad debts arising in cases such as this by requiring payment in advance before an order will be accepted.

However, this approach may not be practical in dealings with other businesses or regular arrangements, where invoices are normally raised after delivery has been made.

Defective and retuned goods

When an item is defective, the customer has the legal right to have the item replaced.

This occurs because the original contract has not been fulfilled in the case of a defective product.

The original contract that was implied by the product order would be for the exchange of an operational product for the product payment.

In the case of a customer changing their mind regarding a purchase, there is no automatic right to return goods, as a clear exchange has been agreed and then completed.

Retail operations may have varying policies for returned goods.

Some businesses do not accept returned goods, others accept returns in exchange for other purchases, while some provide cash refunds.

2.2.8.5. Torts

A tort is a legal concept that involves an action that causes injury.

In this context, the term "injury" is used in its original and wide meaning of an event that causes damage to another.

The legal use of the word "injury" is not limited to physical injury.

This may involve financial loss, damage to a professional or personal reputation, or physical harm.

Negligence is an example of a tort.

In a case of injury, legal action may be initiated by the injured party.

In situations where injury is caused by reckless action, or a lack of appropriate actions and due care, payments may be awarded from the party being sued to the party lodging the claim to compensate for damage.

However, the negligence is an extremely serious situation and the test for establishing that negligence has occurred is quite strict.

The actions involved must fall below a minimum threshold of reasonable performance, and the actions must have created a dangerous situation or failed to prevent damage occurring.

A standard of effort or performance that is basic or lacking in some respects is not generally sufficient to establish negligence.

Negligence may apply to a party performing a service in exchange for money.
(** check product liability etc)

In this context, an individual or business could be sued by a customer to recover damages, if the customer suffers injury as a result of the actions of the individual or business.

(** list of major torts)

2.2.8.6. Trusts

In addition to loans and trade of property, the law also recognises the concept of property held on trust.

In this case, the ownership of the property is transferred into the name of another party, known as the trustee.

However, the trustee is then bound to use the property for specific purposes, rather than for their own use, as outlined in a document known as a trust deed.

A trust deed is a set of statements that outlines the rules and procedures to be used for dealing with the funds.

The law of trusts is very old, and trust law originally specified some particular details for forming a valid trust document, such as a requirement that the deed by written on paper or parchment, but not on other materials.

An example of a trust would be a situation where parents died leaving young children.

In this example, the parent's funds may be transferred into the name of a trustee, such as a relative.

However, these funds would be held on behalf of the children until they reached the required age.

The trustee would be free to spend the funds for purposes directly benefiting the children, such as education expenses, but would not be free to spend the money for personal use or any other purposes.

Bank accounts and property titles would be held in the name of the trustee.

Trusts are commonly used to hold assets for investment management, for transfers of assets through inheritance, and businesses are sometimes operated through trusts.

In situations where the trustee misuses the funds, this represents a breach of trust and legal action can be taken to recover the missing funds.

2.2.8.7. Agency

The law recognises a situation where one party acts on behalf of another person.

For example, a person may wish to bid at an auction, but may be unable to attend personally.

In this case, the bidder may ask another person to attend and bid on their behalf.

This person then holds authority as an agent of the bidder, and may sign a legally binding contract on their behalf.

In the case of a successful auction, the agent may sign a sale contract that is binding on the original bidder, not the agent themselves.

Complex situations can arise when an agent performs actions that were not requested or authorised by the original person.

The term "agent" has a technical legal meaning that is different from the common usage in fields such as real estate and insurance.

In these cases, the services are generally advisory, and the person does not have legal authority to sign contracts on behalf of the buyer or seller.

A power of attorney is an example of an agency arrangement, where the agent has legal authority and power to conduct the person's affairs, such as trading property and entering contracts.

Employment is an agency arrangement, as well as a commercial exchange of funds for services.

In general, an employee has the ability to perform actions that are binding on the business, within the constraints of the authority limits that are provided to the employee.

For example, a loan document that is signed by a banking officer is a binding contract for the bank itself, not the individual that signed the document.

2.2.8.8. Debt

In addition to lending property, the concept of debt is also recognised by the law.

In this case, money is owed from one person to another.

This may be due to repayment of money that was originally borrowed, or may be owed for other reasons, such as a payment for goods that were received.

Debt generally carries interest payments, and a schedule for repayment of the principal.

If payments are not made as required, the party that is owed the debt can take legal action to recover the funds.

In the case that the funds are not recovered, the creditor can lodge a petition with a court to have the debtor's affairs wound up in a bankruptcy proceeding.

In this situation, the debtor's assets are sold and used to repay the outstanding debts.

2.2.8.9. Companies

A properly registered company is recognised by the law as an independent entity, separate from any individual person.

This concept first emerged in English law in the (**check) century.

A company can perform most of the actions that an individual can perform.

A company can own property in its own name, it can enter contracts, it can be a trustee, and it can enter legal action in its own name.

This differs from trusts, agency arrangements, partnerships, and other situations, which all involve transferring legal authority from one person to another person.

A company is the only legal entity aside from individuals that has an independent existence, and can own property directly.

The assets of the company are owned by the shareholders.

A shareholder can be an individual, or another company.

The ownership of a company is divided into a number of shares.

All shares are identical. Each share has one vote in the operation of the company, and has an equal share of the company's assets.

In some cases, different classes of shares are issued. This may involve voting and non-voting shares, and preference shares which include a different dividend rate to ordinary shares.

Ordinary shares form the bulk of available shares, with other classes of shares being issued in a minority of cases.

Individual shareholders may own more than one share, and so may own a larger or smaller proportion of the total assets than other shareholders.

Shares may be unlisted, in which case they can be bought and sold directly between individuals, or listed on a stock exchange, where they may be bought and sold through the stock exchange.

Shareholders elect a board of directors at an annual general meeting to operate the company.

The directors have authority to sign documents on behalf of the company.

In some cases, the directors may also be major shareholders, and may operate the company personally.

In other cases, directors operate in a supervisory capacity, reviewing the operation of the company and voting on major decisions such as the purchase and sale of parts of the business, and authorising major projects.

Funds are contributed by the shareholders, and become assets held in the company name.

In turn, these assets are then indirectly owned through the shares that are held.

If the company becomes insolvent and cannot pay debts that are due, it may be liquidated.

In this case, all assets are sold, and all debts repaid.

Any remaining funds are then distributed to the shareholders.

Companies generally have limited liability.

In the case where there is a deficit and there are insufficient funds to repay the total debts, the remaining debts are cancelled, and no additional funds are required from the shareholders.

In other terms, the value of a share can fall to zero, but it cannot fall to less that zero and require additional payment.

In practice, banks lending to small and medium sized companies will often refuse to lend without personal guarantees from directors or shareholders.

This effectively may tie the director's personal assets to the company. Should the business fail and the company become insolvent, the directors personal assets can be sold to repay the debts of the business.

2.2.9. Positions of legal responsibility

2.2.9.1. Fiduciary duties

In the eyes of the law, each person is independent.

A person bears the burden of their own existence, rather than the burden of another person's existence.

However, the law also recognises certain situations that involve a person acting on behalf of another.

The trustee of a trust is an example of this situation.

In this situation, assets may be held in the name of the trustee, but may be governed by the requirements of a trust deed.

For example, investment funds may be transferred into the name of a trustee for the purpose of managing the investments.

The investments would then be managed for the benefit of the original investors, not for the benefit of the trustee.

In these cases, although the legal ownership is in the name of the trustee, the effective ownership belongs to the beneficiary of the trust.

This situation is known as by the legal term of a fiduciary duty.

A fiduciary duty arises when a person accepts a post that involves acting on behalf of another person.

2.2.9.2. Services

An agreement to perform services or supply products does not involve a fiduciary duty.

Each party remains independent.

In the case of a product or service not meeting the agreed standard, the other party may sue for a breach of contract to recover their loss.

The law is not completely clear in some cases, and attempts have been made to sue parties such as auditors and lawyers for negligence and breaches of fiduciary duty.

However, in general the law views the provision of services as a contractual relationship, rather than a fiduciary relationship.

2.2.9.3. Positions

Fiduciary duties arise in several types of position.

These include:

A director	A director has a fiduciary duty to manage the company on behalf of the shareholders.
A trustee	A trustee has a legal duty to conduct actions under the trust deed for the benefit of the beneficiaries of the trust.
An agent	An agent acts on the instructions of the appointing party, when the party themselves

	cannot personally attend a situation. An agent has the legal authority to sign contracts and perform actions that are binding on the original party.
Medical services	In the case of life-threatening and other serious situations, medical services bear a fiduciary duty, in addition to a contractual relationship.

2.2.9.4. Duties

Duties of a position of legal responsibility include the following:

1. To act with due care and diligence.

This involves paying careful attention to the situation, avoiding reckless and haphazard actions, and ensuring that the relevant steps are taken to fulfil the duties associated with the position.

2. To act according to instructions.

A director must not act in contradiction to the memorandum of association of the company, a trustee must fulfil the steps laid out in the trust deed, and an agent must fulfil the instructions supplied by the appointing party.

3. To avoid conflicts of interest.

In some cases, a personal interest, or another position that is held, may conflict with the position itself.

For example, a director may also be a director of another company that launches a takeover offer of the first company, while a trustee may own personal assets that would be suitable for purchase by the trust itself as an investment.

A person holding a position of legal responsibility must avoid situations that involve conflicts of interest, by abstaining from discussion or voting on certain issues, by avoiding transactions which involve a conflict of interest, or by resigning from the position.

The memorandum of association of a company is a brief document that includes procedural details such as procedures for the appointment of directors, timing of annual meetings, and voting arrangements.

2.2.9.5. Independent judgement

Although a person owing a fiduciary duty acts on behalf of another person, this does not imply that they act mechanically as the other person would in a particular situation.

A director is legally required to act independently in the management of the company, and not to act as an agent for any other party, or in collusion with any other party.

An agent must complete any direct instructions that are specified by the appointing party, however, when unexpected situations arise, an agent may form an independent decision as to the actions that would be most appropriate in fulfilling the instructions and acting for the benefit of the appointing party.

2.2.9.6. Liability

In cases where a person in a position of legal responsibility fails to perform the duties adequately, and the fiduciary suffers injury as a result, then the fiduciary may sue the person to recover the loss that has been incurred.

In this context, the term "injury" includes physical injury, financial loss, and damage to a professional or personal reputation.

This does not apply to situations in which injury occurred, despite the person fulfilling the position according to the required steps.

This action is taken on the basis of negligence, or breach of trust.

Negligence

Negligence occurs when the person acts recklessly or haphazardly, or fails to perform the basic steps required to perform the position.

This must lead to the creation of a dangerous situation, in which the fiduciary suffers injury as a result.

Negligence is a serious situation and the test for negligence is quite high.

Human error occurring during correct and careful procedures, or work that is of a basic standard or deficient in some respects is not sufficient to meet the standard of negligence.

Breach of trust

Breach of trust occurs when the person holding the position of responsibility fails to act in the interests of the fiduciary, and acts for their own benefit or for the benefit of a third party.

For example, a trustee of a trust who used the assets of the trust for personal uses would be guilty of a breach of trust.

2.2.9.7. Capacity

A person can hold more than one position at a particular time.

For example, an individual could be a director of a company, a trustee of a trust, and also enter contracts in their own name for personal purposes.

The position itself is known as a capacity.

A person holding a capacity has the legal powers, and also the legal duties, associated with that capacity.

For example, a director of a company can sign contracts that are binding on the company itself, rather than the individual director.

In cases where more than one capacity is held, it is common to indicate the capacity under which a document is being signed by indicating a title or other description beside the signature.

For example, in theory a director could form a legal contract between a company and themselves as an individual, by signing the contract twice, one in the capacity as a director, and once in the capacity as a private individual. (** check).

2.2.10. Defamation

Business activity operates on the basis of the ancient Latin term "caveat emptor".

This translates into English as "buyer beware".

A party offering a product or service for sale, including the business itself, can generally be expected to present the item in its most favourable light.

Also, business operates on a competitive basis in two respects.

Businesses compete with other businesses to win sales from customers and clients.

Also, in dealing with a customer or a supplier, a transfer of value may occur.

This has an equal and opposite effect on each party, so that a benefit received by a customer or supplier becomes a loss to the business.

However, a business cannot operate on a sustained basis if it carries a reputation for acting dishonestly.

Business reputation within an industry

Business is based on trade with others.

In any sustained business activity, repeated transactions must be made with the same customers and suppliers.

Customers and suppliers will not deal with a business if there is a fear that they may be trapped and suffer loss due to the actions of the other party.

In this context, dishonest actions could be defined as some of the following acts:

- Making false statements.
- Taking a series of steps, designed to lead the other party into a position in which they become trapped and suffer a loss.

Defamation

Defamation occurs when statements are made that are critical of the business or individual.

In general, any statement that harms the reputation of the business or individual could be considered defamatory.

This includes slander, which involves spoken statements, and libel, which involves written statements.

An important distinction occurs between statements regarding actions and facts, and statements regarding motives and character.

Statements of opinion regarding motives and character may be unpleasant in some circumstances.

However, each person is entitled to their opinion, and is entitled to express it.

When a statement relates to an actual event or fact, however, a different situation applies.

If a person claims that the business or individual performed a certain act, when in fact this did not occur, then a serious step has been taken.

These actions can effectively terminate the operation of the business.

Defamation of this type can lead to insolvency, liquidation, and the termination of the business's or individuals ability to operate within a particular industry or within business activity in general.

When a statement regarding a fact is made that is not accurate, and damage to the reputation of the business or individual occurs, the business can sue the person who made the statement, and recover the cost of the damage from the person who made the statement.

Defences to defamation

(** check details)

In general, any critical statement may be considered defamatory, unless the person making the statement has reasonable grounds for believing that the statements are true.

A rumour heard from another person does not meet the legal standard for reasonable grounds.

In practice, this would involve describing an event that the person had witnessed with their own eyes, or a transaction that they had been personally involved in.

Hearing information from one person, and then repeating this to another person, is classified as making a defamatory statement to the second person.

The burden lies with each individual to have reasonable grounds for belief before making a critical statement.

Defamation in practice

Defamation arises in commercial situations in a number of circumstances.

Rumours and general discussion are an unavoidable element of the business environment.

In the case of specific events, however, a different situation may apply.

For example, a detailed report may be prepared of a product, service, of work that the business performed.

If this report was critical of the object being reviewed, and the report was inaccurate, then the party producing the report may be sued for defamation.

In some industries, reviews of products, services, or work performed may have a significant impact on the future income of the business.

As an author of information reviewing other individuals or businesses, the business should generally exercise great care in ensuring that facts are accurate, and that the overall impression created and the conclusions reported formed a reasonable assessment of the situation.

Specific transactions

These issues may not generally apply in cases of specific transactions, such as purchases and sales of assets.

In these situations, the nature of the item and the payment terms become the primary considerations, with issues involving the other party not being relevant to the decision to accept or reject the transaction.

Issues of defamation may particularly relate to service industries, involving regular transactions with established clients, and situations in which the client may be exposed to potential loss through the future actions of the business.

2.2.11. Licences & Intellectual Property

The law recognises intangible property of various types.

This includes patents of inventions, copyright of artistic works, and licenses to perform certain actions.

Examples of artistic works recognised by the law include music, film, designs, photographs, and computer software.

This property has similar features to other property such as buildings and equipment.

It is owned by an individual or company, and it can be sold, loaned or given as a gift.

However, intellectual property has some unique features.

Intellectual property has an existence that is separate from its physical form.

For example, a recorded music song, and a written page of notes, may both involve to the same creation, even though they have completely different physical forms.

Also, intellectual property can be duplicated without destroying the original.

When a physical item is sold, the income is received and the item is lost.

However, property such as music can be duplicated and licensed for a fee, and the original is not lost even through a fee has been received.

Licensing intellectual property is similar to lending a physical item, such as leasing a building to a tenant.

The owner of the property retains ownership of the property, however the customer has use of the property in return for the fee.

Intellectual property can be duplicated and licensed to more than one customer.

Although intellectual property can be sold, in most commercial situations the property is retained by the creator of the property, and the customer is given a license to use the item.

For example, ownership of music is retained by the artist or record company, while ownership of computer software may be retained by the company that developed it.

The cost of purchasing a music disk or computer program involves the cost of the physical disk, which is usually very low, and a license fee for the right to use the property.

2.2.11.1. Patents

A patent is a legal recognition that an invention has been created, and granting the inventor certain rights.

Patents must be granted by the patents office to have effect.

A patent can generally be granted for any invention that creates a new process, method, or structure that was not in existence before the inventor created the design.

Patents are not available for a process or structure that is in common use.

The main effect of a patent is that it prevents other parties from using the invention without the permission of the inventor.

For example, manufacturing a product based on a patented design, without the permission of the inventor, would be a breach of the investor's patent rights.

The inventor could then sue the manufacturer to recover the loss that they had incurred through the invention being used without permission or the payment of a fee.

Patented processes are sometimes licensed to other manufacturers, who pay a regular license fee for the right to use the process or design in their manufacturing.

This may involve patented technology for use within a production process, or the product itself may be based on a patented design.

Medical drugs are an example of a common patent situation in commerce.

In this situation, the company that developed the medication manufactures the product for the period of the patent.

After the patent expires, other manufactures may also manufacture the product.

Patents have a limited term.

At the time of writing in Australia, this is generally 20 years (** check term).

At the end of this period, the patent lapses, and the invention becomes part of the public domain.

2.2.11.2. Trade marks & Brand names

Brand names and trade marks can be registered as property of the business.

This includes graphical logos, and the names of products.

For example, well-known brand names may have considerable value, and may be listed in the balance sheet as an asset of the business.

If another manufacturer produced a replica of the brand name or logo on their own products, this would be an infringement of the rights of the owner of the registered trade mark.

In these cases, the owner of the trade mark could sue the person who imitated the trade mark.

This would generally result in a court order for the infringing party to cease producing the goods with the imitation brand name or logo, together with an order for payment of damages to the owner of the trade mark to compensate for lost sales.

This situation also applies to producing close imitations of graphical logos and brand names, as well as direct duplication, if the imitation could lead to customers mistakenly selecting the alternative product, in the belief that they were purchasing the original product.

2.2.11.3. Copyright

Copyright applies to artistic creations such as music, film, designs, and computer software.

Copyright applies as soon as an item is created.

A creative production does not have to be registered for copyright to apply.

The creator of the item initially owns the copyright to the item.

Copyright gives the owner the right to control the use of the item.

For example, if other parties make duplications of the item without the permission of the copyright owner, this would be an infringement of the copyright holder's legal right to control the copying or distribution of the work.

In the case of copyrighted items, the customer generally purchases a licence to use the item.

The customer in these cases purchases a right of usage, rather than ownership of the property.

Only one party can own an item of property at any particular time, and a sale of copyright involves the ownership of the copyright passing to the purchaser.

Ownership and licensing of copyright is a significant issue in the development of computer software and in industries involving artistic creations.

In the case of work performed on a daily basis, such as general computer programming and graphics designs within advertising, copyright generally remains with the business as part of the contract of employment.

In the case of projects that are specifically commissioned, the copyright of the completed work may generally pass to the client as part of the contract for developing the item.

In the case of independent works, such as music creation, copyright may remain within the original artist, with parties such as recording companies receiving fees for funding initial developments, production and distribution.

However, many different situations and arrangements may occur in these circumstances.

Copyright operates for a limited period, and terminates fifty years after the death of the person who created the work (** check).

After this time, the item becomes part of the public domain.

2.2.11.4. Licences to operate

In many industries, a license must be held before a business can perform a certain activity without incurring a penalty.

Licenses fall into a number of different categories.

Transferable and non-transferable licenses

Some licenses are transferable and can be sold to another party, while other licenses are not transferable.

For example, a license to operate in a particular trade or profession would not normally be transferable.

However, a licence to operate a facility, such as a license to operate a taxi, is often transferable and could be sold to another party.

Unlimited licenses

Unlimited license require certain conditions to be met in order for the license to be granted.

Any party meeting these conditions is granted a license.

Banking is one example. An organisation must hold a banking license in order to provide banking services to the general public.

A grant of this license requires certain conditions, such as a minimum level of shareholder's capital, as a buffer against bad debts.

However, any organisation meeting the required conditions would be granted a banking licence, and there is no restriction on the number of banks that could be in operation.

The granting of licenses may be based on objective and subjective conditions.

Objective conditions are fixed criteria that can be met by a business applying for a licence.

For example, there may be a minimum dollar value of shareholder's funds required for a banking operation, or a test which must be passed before a licence will be granted to perform a dangerous activity.

Subjective criteria involves the party granting the licence forming an opinion that the granting of an additional licence would be desirable or undesirable, or forming an opinion about the applicant themselves when deciding to grant or reject a licence application.

For example, an application to form a new stock exchange could be rejected on the grounds that competing stock exchanges would spread trading liquidity more thinly, which could reduce the overall efficiency of the capital markets.

In the assessment of the applicant themselves, an example would be the application for a license to operate a casino.

This process involves an extremely thorough probity check to determine any links to criminal activity from the applicants, due to problems that have arisen with casino operations in the past.

However, this is still an objective assessment in the sense that particular relevant issues are investigated, rather than a personal decision being made regarding the application that is not based on relevant issues.

Restricted licences

The second type of license relates to restricted licences.

This applies in cases where a limited number of licenses are made available.

Restricted licenses occur in two cases.

A restriction may be based on a physical limitation or other availability requirement.

For example, an airport has a fixed number of docking terminals for aircraft.

Under one arrangement, each terminal could be licensed to a particular airline.

In that case, there would be a limited number of physical facilities that were available for use.

This situation also occurs with other physical infrastructure such as ports and rail links, and in the case of sections of radio frequencies for television broadcasting, radio, and mobile telephone communication.

The other type of restricted licence applies to limits that are placed on the number of licences for reasons that are separate from natural physical limits.

This may be done for two reasons.

One reason is that a limit may be seen as desirable for practical purposes.

Also, restricting the number of licenses may increase the value of each license, which may enable revenue to be derived from license fees from the initial granting of the license, and ongoing licence fees, or a combination of both.

For example, in some cases the number of taxis that operate within a city is restricted to a certain number.

Allocation of licences

Restricted licences may be a highly significant issue in some industries, and in business in general.

The value of a license can be extremely high.

For example, a license to use a spectrum of the radio frequencies for mobile telephone communication can cost in the order of a billion dollars (** check details).

The value of a license to operate a single taxi may cost $100,000. (** check)

This income flows to the government body that issues the licence.

In some cases a single payment may be required, while in other cases an on-going fee may also be due.

The cost of a licence may be a significant barrier to entry for new businesses that wish to operate within an industry.

Restricted licences are allocated in various ways.

When new licenses are issued, they may be issued for a fixed fee, or they may be auctioned to the highest bidder through an auction process.

In a stable market with long term operations, the licenses will generally trade at a certain price, that reflects that income that can be made from operating in that industry.

These prices may rise and fall over time, but remain at a reasonably stable level.

Operators wishing to exit the industry offer their licenses for sale, while businesses wishing to enter the industry purchase a license that is available for sale.

An alternative method of establishing operations within a market is to buy a business that is currently licensed and operating within the industry.

One of the most common reasons for buying another business is to gain entry to a new market.

This does not involve a cost saving compared to purchasing a licence directly, as the cost of the business would include an amount that related to the value of the license.

However, this approach may avoid the complexity of establishing new facilities and operations.

This method is particularly relevant where there are a small number of licenses that trade on an infrequent basis, and a liquid market in buying and selling licenses does not exist.

Restricted Practices

In the case of a small number of licenses, there may not be a regular market of licenses being bought and sold.

In the case of airline terminals, for example, there may be a few dozen docking ports, leased on long-term leases by a small number of airlines.

This would effectively prevent a new business from commencing operations within this market.

In some situations, commercial law regulations include provisions that allow a business to lodge a claim for access to a facility that would be necessary in order to operate within a particular industry.

This generally occurs in cases involving infrastructure terminals that cannot be duplicated due to physical constraints, such as ports and airline terminals.

2.2.12. Commercial law

2.2.12.1. General law

Major areas of the law affecting commercial transactions include the following areas:

Contract law	An agreement between two parties, such as an agreement to provide a service for a regular fee. Contract law allows one party to recover losses due to the other party failing to complete their terms under the contract.
Trust law	Property held in the name of a trustee. Trust law enables the beneficiaries of the trust to recover funds from the trustee if the trustee acts outside the terms of the trust deed.
Employment law	Regulations relating to employment, including health and safety regulations, benefits such as leave and superannuation, regulations governing hiring and dismissal of employees, and other employment-related laws.

Environmental law	Regulations governing pollution, and the use of natural resources.
Negligence	The law of negligence allows shareholders to sue directors who fail to perform their duties adequately, and recover losses from director's personal assets.
Commercial law	Regulations governing the registration of companies, issuing prospectuses and fundraising, company mergers and takeovers, and trading through stock and futures exchanges.
Tax law	Regulations specifying the calculation and payment of tax.

In some cases failing to comply with legal requirements may lead to civil penalties such as fines, while in other cases, criminal law applies.

2.2.12.2. Regulatory issues

Registration

In some cases business activity can proceed without regulatory involvement.

However, in many cases a business must be registered with a government regulator and with tax authorities.

To create a company, an application form must be submitted to the relevant regulatory authority.

This involves a list of basic information such as the name and registered address of the company, the names and addresses of the proposed directors, and the names, number of shares, and addresses of the founding shareholders.

A registration fee also applies to cover administration costs.

Reporting

Depending on the size of the enterprise and the legal structure that is used, accounts and annual returns may have to be produced, and in some cases submitted to regulatory authorities and stock exchanges.

In the case of small enterprises, the requirements are generally minor.

This may include submitting annual business returns, tax returns, and other documents.

In some cases, nominal fees apply to cover administration costs.

Disclosure

In recent years, there has been a trend towards more detailed and frequent reporting of information.

For example, in past times annual accounts were common, with delays of several months meaning that information could be a year and a half out-of-date.

More recently, quarterly reporting has become common, with delays falling from months to weeks.

In Australia, and in many other countries with similar regulatory systems, significant information must now be released as soon as it becomes available.

This is in contrast to previous periods, when significant information was sometimes announced in an annual report.

Any information that could have a significant impact on the company, and so could affect the share price, must not be released as soon as it becomes available.

This would include information such as takeover offers, settlement of court cases, transaction of sufficient size to impact directly on net profit, and resignations or hiring of senior personnel.

This is generally done by sending a document in a format similar to a press release to the stock exchange, which distributes the announcement and associated documents to information service providers.

This information is generally available on-line through on-line brokers.

Information does not need to be released if it relates to negotiations that are in progress, or if it relates to a new process or formula that has value for the company, and may result in a lost benefit if competitors where to posses the information.

Insider trading

Insider trading occurs when a person has knowledge that is not publicly available and buys or sells shares in the company.

For example, the company may receive a favourable result in a major court case, and a person knowing this may buy the shares before the public announcement, to profit from the rise in the share price.

This practice is prohibited under the commercial law.

In order to avoid the possibility of insider trading becoming an issue, an employee, director or any other person should only buy or sell shares in the company when there are no major items of information outstanding that have not yet been announced.

A common internal requirement for senior staff, who may have knowledge of the company's year-to-date trading figures, is to allow trading only during the few weeks following a regular profit announcement, to avoid the risk of insider trading becoming a possible issue.

All purchases and sales of shares by directors in their own companies must also be reported to the stock exchange.

As in most situations, insider trading does occur, and scandals appear from time to time.

Market manipulation

Market manipulation occurs when an attempt is made to alter a share price artificially.

This practice is prohibited under the commercial law.

In general, a person is entitled to buy and sell any shares at any time that they wish.

In the case of large transactions involving the shares of small companies, the transaction itself may significantly move the share price.

This effect is known as “market impact”, and cases a loss for the person initiating the trade.

For example, in selling a large parcel of shares, the price may be pushed down as lower offers are made to attract enough buyers to sell the entire parcel.

This causes a reduction in the average price received by the seller of the parcel.

The same effect also occurs with large buy orders, with a higher average price being paid by the buyer.

However, although attempting to move a share price by placing a large buy or sell order may generate a loss for the party initiating the trade, this may still occur in some situations.

For example, an options contract may be based on a current share price, and in cases where the share price was close to the trigger price on the date of the option expiry, an attempt may be made to move the share price across the trigger price.

Market manipulation and insider trading may attract the standard commercial law penalties including fines, cancellations of licences, and imprisonment.

General regulations

The commercial law contains detailed provisions for the timing, documents, and information required in a number of different corporate activities.

These include:

- Floating a company on the stock exchange
- Raising additional equity from investors
- Raising debt from investors
- Launching & responding to a takeover offer
- Annual accounts and reporting

2.2.12.3. Commercial practices

Some commercial practices are prohibited, and may attract penalties when they are carried out.

This varies from time to time and place to place, however it generally includes the following issues.

2.2.12.3.1. Restrictive trade practices

In some cases is it illegal to take action that prevents another person from operating a business or carrying out a trade or profession.

This includes terms within employment contracts that would have the effect of preventing the person from operating within an area or timeframe after leaving the employment of the business.

In some cases non-competition clauses are allowed, such as cases involving the sale of a business, with an agreement that the seller will not set up another business in competition with the existing business within a certain area within a certain period of time.

2.2.12.3.2. Misuse of monopoly or market power

In cases were a business may have dominant share of a market, some practices may be forbidden.

For example, action taken to prevent a competitor from entering a market may be prohibited.

This could occur through exclusive dealing agreements.

In other cases, the existing business may lower prices below the cost of production for a period of time, with the new business being unable to survive in a loss-making operation for a sufficient period of time to establish a sustainable operation.

2.2.12.3.3. Collusion

In general, collusion between competitors is forbidden.

For example, a town may have petrol stations operated by three different businesses.

The business could meet, and agree to all raise prices at the same time.

This would not affect their sales, as petrol would be a necessity, and would not be available from any other source.

With all prices rising at the same time, customers would not benefit from transferring from one supplier to another.

This practice is known as price-fixing and is prohibited.

Each competitor must act independently, and agreements or co-ordinated actions are not allowed.

In the United States, for example, these laws are known as anti-trust laws (**check).

2.2.12.4. Liability for statements

In certain circumstances, false statements may attract a liability for damages.

In negotiations prior to contracts, such as the sale of a business, false statements may be made.

If the other party then suffers a loss, such as paying an excessive price for the business, they may then take legal action to recover the amount of the loss from the party that made the statement.

In another example, false statements made to regulatory authorities and stock exchanges may attract penalties ranging from fines, to delisting, deregistration and imprisonment in some cases.

In these situations, creating a false impression and allowing a false impression to continue uncorrected may also be considered false statements by the law.

For example, if a potential buyer of a property commented on the large amount of car parking space available, however the parking space was actually associated with a different building, then the seller may be considered to have made a misrepresentation by omission if they did not correct the mistaken impression.

However, situations such these may be difficult to prove.

In general, statements in writing that can clearly be shown to be false would be required.

Also, the extent of the damage that occurred must be established, and this may be difficult to determine.

2.2.12.5. Liability for injury

In some cases, a business may be liable to pay compensation to a customer who suffers injury as s result from a fault in a product that was purchased from the business.

Also, customers and members of the public may sue the business if they injure themselves while on the premises of the business.

Public liability insurance is available that will meet the cost of claims in some of these circumstances.

Various health and safety regulations apply to certain employment situations.

Also, a common-law duty of employment is to ensure that an unsafe work environment does not exist.

In cases where the business fails to adequately address these issues, an injured employee may sue the business to recover damages related to injury.

Workers compensation insurance is available to meet some of these claims.

In some cases, this insurance is compulsory before a business is permitted to operate.

These schemes may be operated as a government insurance scheme, or private insurance, depending on the individual situation.

Insurance to meet lost income and medical expenses, as opposed to a negligence situation, is also available.

This insurance is available in various forms, such as personal insurance policies taken out by the employee, and is often included within the structure of retirement and superannuation funds.

(** check details)

2.2.13. Employment

Employment may involve several separate legal arrangements.

The relationship between an employee and an employer is essentially a contractual relationship.

A contract exists between the employee and the employer, for performing services in exchange for payment.

In some cases, an employee is also a legal agent of the business.

For example, a bank grants authority to a banking officer, under the legal concept of agency, to sign contracts with customers on behalf of the bank.

In some cases a fiduciary relationship may also exist.

This generally applies to a legal duty to ensure that an unsafe work place does not exist.

2.2.14. The law in practice

The law was originally written by the King, who was generally the person, or a descendant of the person, who conquered the country by military force.

In tribal societies, the law may be determined by a council of elders, or by a dominant leader holding the ability to choose the course of actions.

In the modern context of Australia and most other developed Western nations, the law is determined in two ways.

This includes laws voted on and passed by members of parliament.

The law is also determined by decisions made by judges in court cases, which are based on laws passed by parliament, previous judgements, and the circumstances of the case.

A knowledge of the law is important in business for two reasons.

Although the law is of little use in many business situations, in other cases legal action may be successful in recovering losses due to defaults by other parties to contacts and agreements.

An example may be a large development project, where a client may refuse to pay for the completed project, on the grounds that the design did not match the design that they expected.

Disputes of this type can take a considerable period of time to resolve and may involve long court cases.

Also, a business may find that legal action has been taken against it, and large payments could be ordered against the business unless careful attention has been paid to documentation and the arrangements that have been put in place.

2.2.15. Mediation & Arbitration

A number of formal approaches are available for resolving disputes, in addition to the legal system.

These approaches generally involve less complexity and formality than the legal system.

Disputes may also be resolved in a significantly shorter period of time, and with less cost.

However, there may also be severe disadvantages for a business in becoming involved in an alternative dispute resolution approach.

Although the legal system can be slow and complex, it has evolved over several hundred years as a method of settling disputes.

Each of the rules and procedures within the court system exists for good reason, and an approach that does not include these formalities may expose the business to a higher level of risk, rather than a lower one.

Mediation

Mediation involves discussion between the two parties in a formal setting.

This may involve a mediator, who describes the purpose and scope of the discussion, and attempts to keep the discussion within the topic and on reasonable terms.

The mediator does not become involved with the discussion or produce a judgement of the case.

However, this situation may be unlikely to produce a new resolution, other than the business simply accepting the terms demanded by the other party.

Disputes do not generally proceed to a formal stage, such as mediation or legal action, until a long process of discussion has occurred.

Multiple letters, telephone calls and conversations would generally have occurred before a formal process began.

The fact that the formal process has begun, indicates that the initial discussions have failed to produce an agreement, and that the parties have chosen to proceed to the next stage.

If agreement was reached during previous discussions, mediation would not be occurring.

In this environment, the mediation continues the previous discussions within a closed and formal environment.

The other party is unlikely to agree to terms that they have previously rejected.

The business may also not wish to agree to terms demanded by the other party, when discussions have already covered the issues and failed to produce an agreement.

In these cases, a discussion is likely to repeat issues and views that have already been discussed many times previously, with little change.

Discussions may also involve emotional manipulation, personal intimidation, and repeated discussion of a wide range of issues.

Within a closed and formal environment, with discussions that may continue for a long period of time, a risk for the business operator is that they simply give in to sustained pressure from the other party, and accept the terms that are demanded.

This would not be a positive outcome for the business.

In some cases mediation may assist in resolving a dispute, however in many cases this may become a battle of wills, which continues until one party gives up and accepts the other's terms.

In general, a party that is in a weaker bargaining position may be exposed to greater risk within a mediation system, and a direct court action may be a safer alternative.

Independent Negotiators

Another approach could involve a similar process, using independent negotiators such as the lawyers for each party.

This approach has several benefits.

Under this approach, personal involvement and other issues are not involved in the discussion, with the two parties able to discuss the issues simply and clearly.

Also, in some situations, the legal or regulatory situation would be fairly clear, and a solicitor reviewing the case would be able to determine with reasonable accuracy the decision that a court would be likely to make.

If this was the case, then the negotiating parties may be able to come to a common position fairly quickly, if each is aware of the result that would occur if the case continued to a court hearing.

The business's representative would attempt to reach a proposed settlement with the other party.

This would then be brought back to the business, and a decision would be made in conjunction with the legal advisor to continue to a full court process, or accept the settlement as it stood.

Arbitration

Arbitration involves a process that is similar to a court case.

Statements and evidence are presented by each party, with an independent judgement being made by the arbitrator.

Arbitration is used in various situations such as industrial disputes.

This process may reduce the time delays involved in a full court hearing.

Arbitration is particularly suitable for disputes that do not require large amounts of evidence to be presented, but where the dispute is based on a number of other issues.

However, in approaching an arbitration, the business should exercise caution to ensure that the full range of issues would be properly addressed, rather than a decision being made in a short period of time that may be unfavourable for the business.

In the case of a binding arbitration, each party agrees to accept the decision before the case commences, and if the decision is unfavourable, there may be no way to reverse the decision afterwards.

2.2.16. Initiating legal action

Legal action is common in some of the following circumstances:

- Defaults on payments, where payments are due but are not made.
- Insolvency, where attempts are made to involve a wide range of parties in the insolvency process.
- Joint ventures, where two businesses conduct a venture such as creating a distribution business, and disputes arise over particular terms and issues.
- Large project development, where disputes arise over the design of the project, the timing of events, and questions of which items are and are not included within the project.

Legal issues form a major part of large commercial transactions.

In these circumstances, a large proportion of the time may involve conversations with commercial law firms, altering clauses in contracts and trust deeds and ensuring that a wide range of scenarios have been covered in the documentation.

However, the step to initiating court action is a serious step, and is not generally taken lightly.

Apart from the time and cost involved, this generally terminates the relationship between the parties in relation to the current project, and possibly for a significant time after that.

This is a particularly serious issue within industries that may only involve a few organisations.

Commercial law action generally proceeds on a civil basis, with letters outlining issues clearly, and documents being delivered or payments made as required by circumstances or court orders.

However, this step generally marks the end of discussions and negotiations between the parties.

When this step is taken, an arrangement such as a joint venture company or development project must often be considered to have ended, with the court action simply involving the liquidation and break-up of the project so as to minimise losses.

In the case of smaller transactions, legal action usually involves recovering specific payments, with court orders being issued according to the case.

2.2.17. The legal process

The legal process involves contacting a solicitor, who prepares a case regarding the claim.

In the case of a small transaction, a solicitor in private practice is often consulted, while in the case of larger transactions, commercial law firms are used.

For example, a contract may have been entered for the supply of a certain type of equipment, however the equipment that was supplied may have been significantly different from the specification.

The supplier may refuse to exchange the equipment, and may demand payment.

Evidence would need to be assembled in the form of copies of letters, contracts, specifications, and independent expert's reports and assessments.

A claim would then be filed with a court.

When the hearing commences, evidence is presented, witnesses are questioned and a decision is made by a judge or jury.

In commercial matters a jury is not usually involved.

The case would then be determined in favour of one of the parties.

The court may order action to be taken, such as equipment to be returned or delivered.

More commonly, an amount of damages is awarded as compensation for the loss that has occurred.

This involves a payment by the defendant to the party who filed the claim, being the other party to the contract, as compensation for the loss caused by the defendant's failure to fulfil the contract requirements.

This may or may not involve an award for costs, which requires the loosing party to pay the legal costs of the successful party, in addition to the compensation for the loss described in the claim.

Court orders may not be carried out initially, and a long delay involving repeated court appearances may occur before payment is finally received.

Defending a claim against the business involves a similar process.

2.2.18. Attitude of the law

Decisions and contracts

The attitude of the law is to generally not make judgements on the decisions made by a person, but simply to enforce the choices that have been made.

For example, in the case of a contract, a court will not examine the meaning or significance behind the terms of a contract, except in rare cases of duress

or oppression, and but may enforce that each party meet the conditions that they chose to agree to.

Technical terms in agreements

Interpretation of documents is generally very specific, and technical issues with wording and so forth may be interpreted quite literally.

Also, wording in other documents such as trust deeds is also generally interpreted quite literally.

Statements

However, in the case of general statements such as information provided about an item for sale, the law may take a wide interpretation of the impression that would be created by the person's actions.

For example, in some circumstances, simply remaining silent and failing to correct an obvious misunderstanding by a potential customer would be considered equivalent to making a false statement, while a statement that was technically correct but provided a misleading impression may also be classified as a false statement.

These issues may become relevant in relation to contracts, where a contract may not be binding in some circumstances if the other party made false statements in discussions prior to agreement to the contract.

Legal action is common in business, and a business operation of any significant size may find itself appearing in court on a regular basis, as an applicant or as a defendant.

2.2.19. Summary of commercial law

The law is a complex and vague thing.

Also, much of the law is not written in any one place, but is based on the principles that have emerged from many cases and legal judgements.

However, the major principles of the law as it applies to business situations can be summarised in the following three principles.

1. In general, any contract or agreement that is signed is legally binding.

   If a party fails to complete an action that is listed in the contract, the other party may sue them to recover the loss that has been incurred.

   Likewise, if the other party fails to complete an action, the business can take legal action against them. However, may be a slow and expensive process and is not always practical.

2. If an individual or company holds a position of legal responsibility, and the party to whom they owe the responsibility is injured by their conduct, then the other party may sue to recover the loss that has been incurred.

   In this context, injury includes financial loss as well as compensation in relation to physical injury.

   Positions of legal responsibility include:

   - A trustee of a trust.
   - A director of a company.
   - An agent under an appointment to act as an agent.
   - An employer (regarding health & safety regulations etc).

   In defence to this, a person may not be liable if the following circumstances apply:

   - They exercised reasonable attention and diligence to fulfilling the post (known as due care or due diligence).

   - And, they complied with the requirements specified in any associated instructions, such as the trust deed for a trustee, or the company articles of association for a director.

3. Various government regulations apply to business, including submitting a range of registration and procedural information, and abstaining from performing certain business practices, such as price fixing in collusion with competitors.

   Penalties apply for breaching these regulations

2.2.20. Legal terms

Acceptance	A clear statement that a party accepts an offer that is made by another party. A contract comes into existence when an offer is accepted.
Adversarial system	A trial system used in the United States that views a court case as a contest between two parties. The judge rules on technical issues and maintains order in the process, while the parties present their cases to the jury for judgement.
Agent	A person who acts on behalf of another person and has authority from the first person to perform legally binding acts on their behalf. This may involve signing contracts of performing other acts in place of the first person, and has the effect as if the first person performed the act. Any person can be an agent for any other person, if authority is given by the first person.
Beneficiary	A person who is entitled to the benefit of funds held within a trust. Funds held under a trust deed are held in the name of the trustee, and under the control of the trustee, however they are held for the benefit of the beneficiaries.
Black-letter law	Documented statutory law, as passed by parliament.
Breach of contract	Failing to perform an action specified in a contract.
Breach of trust	Failing to perform a fiduciary duty for the benefit of the fiduciary, but acting in the interests of another. For example, a trustee who used the assets of the trust for personal purposes would be guilty of a breach of trust.
Capacity	1. The ability to form a legally binding contract. This requires that the person be over the age of legal capacity, generally 18 years of age, and that they not be intoxicated or be mentally incapacitated. 2. A position that is held that carries associated legal powers and duties, such as a director, trustee or agent.
Chattels	Items attached to a building that are included with the sale of a property, such as light fittings and curtains.

Common law	The principles and laws derived from past court judgements. This common law is not documented in a single place, but certain principles have emerged from a large number of cases.
Company	A legally recognised entity that is separate from any individual, and can own assets, enter contracts, act as an agent or trustee, and enter legal action.
Consideration	The other item of value with a contract, such as the payment made in exchange for an item.
Contempt of court	Failure to carry out an action ordered by a court. (**check)
Contract	An agreement, generally an agreement to supply an item or service in return for payment.
Court order	An instruction from a court ordering that an action be performed, such as paying a sum of money as compensation, or ceasing to produce a certain product.
Damages	Money required to be paid as compensation for loss.
Deed	A document containing a declaration or set of statements that are intended to have legal effect, such as a trust deed regarding property held on trust.
Default	An event where an action that is required under a contract does not take place, such as failing to make a payment due on a debt repayment, or failing to deliver a product according to a contract schedule.
Duress	Using force, intimidation or other means to induce a person to enter a contract. A contract is not enforceable if it is entered under duress.
Equity	A separate court system from the common law system that operated in England for a period of time. In recent times a single court system has operated, drawing on principles and judgements from previous common law and equity judgements
Fiduciary duty	The relationship between a trustee and the beneficiary, a director and the shareholders, or other situation in which a person holds a post, with the duties of that post involving acting in the interests of another.
Inquisitional system	A trial system used in some Asian countries that views a court case as an examination of the accused, with the accused being questioned by a judge or jury. (** check details).
Instrument	A document that creates legal implications, such as a contract or trust deed.

Liability	A situation in which damages may be awarded against a party, and payment may be required as compensation for loss.
License	A right to perform certain actions without penalty, such as a license to use a radio frequency spectrum.
Litigation	Conducting legal action, through lodging a claim with a court, such as claiming that a breach of a contract has occurred, and requesting a court hearing.
Negligence	Failure to perform a service or duty carefully and safely, leading to a dangerous situation and injury.
Offer	1. A clear statement that a party is prepared to enter a transaction. For example an offer to sell an item at a specified price, or an offer to buy an item at a specified price. 2. An offer to sell. In financial markets trading and auctions, an offer to buy is known as a "bid", while an offer to sell is simply known as an "offer".
Party	An individual, company, trust deed arrangement, partnership, or other arrangement that acts as a single entity within a legal arrangement or other situation. For example, a contract of employment may be between two parties, a company and an individual, while a contract of sale may be between two companies.
Patent	A legal right to perform certain actions with an invention, such as manufacturing it exclusively for a fixed period of time. A patent must be awarded by the patents office before it becomes effective.
Precedent	Law is based on precedent, which states that the judgements of previous court cases form a set of laws that are binding on future judgements.
Premises	A building that is occupied by a business.
Property	Anything of value that is owned by the business, such as equipment, cash, patents, land and buildings.
Recision	A court order that cancels a contract (**check)
Recitals	A list of definitions at the beginning of a large contract or trust deed, defining the meaning of terms used within the document
Statutory law	The law passed by parliament.
Sue	To lodge a claim against another party with a court.
Term	A major element of a contract. The breach of a term could lead to termination of the contract and an award of damages.

Title	Ownership of an asset. Ownership of land is recorded by a title, and in general usage, to have title to an item of property is to own it.
Tort	A type of action this is recognised by the law and that caused damage. In situations involving torts, a party suffers damage due to the actions of another party, and may sue the first party to recover the extent of their loss. Examples of torts are negligence and defamation.
Trade mark	A registered business logo or symbol. Copying or impersonating a trade mark can result in an award of damages against the infringer.
Trust	A legal situation in which assets are held by one person on behalf of another.
Trustee	A person who holds assets in their own name, for specified purposes or for the benefit of another person. The rules setting out the management of the funds are included in a trust deed.
Warranty	A minor term of a contract. A breach of a warranty may not normally leading to the termination of the entire contract

2.3. Ownership

Business can be owned through a variety of structures.

Ownership of a business implies two things.

This includes the ownership of the business assets.

Ownership of a business also involves the ability to perform legal actions on behalf of the business, such as signing contracts.

Assets

Assets may include cash holdings, equipment, production facilities, and intangible assets such as patents.

In addition to owning the direct assets of the business, an operating business may have a value beyond its static assets.

For example, a cash flow based service business operated through a company structure may have few assets.

However, the company itself may have value in the case of a successfully operating business with positive cash flow.

Ownership of the business may involve the direct assets, and also the value of the business structure as an operating enterprise.

Legal capacity

Ownership also implies the legal capacity to perform actions on behalf of the business, such as making payments and signing contracts.

This legal capacity is often delegated to employees by granting authority, as an agent, to sign documents and make payments on behalf of the business.

2.3.1. Sole trader

A sole trader conducts a business activity personally. All funds and contracts are held in the trader's personal name.

A business name may be registered and used for trading purposes, however this is simply an alternative name used for business purposes.

A business name cannot be used to own property or enter contracts, and a business name is not recognised as a separate person by the law.

In some cases, the business and personal assets may be combined.

In other cases, separate accounts and assets are held for personal and business purposes.

2.3.2. Partnership

A partnership involves several individuals working in a common enterprise.

Partnerships are recognised by the law, however they are not a separate legal entity, and assets cannot be owned in the name of the partnership.

Assets in the case of a partnership may be owned jointly in the names of the partners. (** check details of asset titles & ownership for partnerships)

Partnerships do not have limited liability.

A partner may be personally liable for debts beyond the size of the investment in the partnership, and for debts incurred by other partners.

Also, transferring and selling the interest in a partnership may be difficult.

However, distributing income through a partnership, and adding and removing funds from the enterprise may be easier with a partnership than with a company.

Partnerships are commonly used in professional practices, such as firms of solicitors.

This often applies to situations where the partners perform services personally and share administrative and other expenses.

2.3.3. Private Trusts

Some businesses are operated through a trust, with the business assets being held under a trust deed in the name of a trustee.

This allows the income from the business to be distributed to beneficiaries of the trust in a variable way, in contrast to companies in which case a dividend payment is the fixed amount per share.

2.3.4. Unit trusts

In some case, particularly in the case of business structures that are used primarily to hold assets such as property or infrastructure assets, a unit trust is used rather than a company.

In this case, the assets are held in the name of a trustee.

The trust assets are then divided into a large number of units.

Units may be listed or unlisted.

In the case of unlisted units, an application is made to the business managing the investment to subscribe for new units.

Withdrawing from the investment involves submitting a request to withdraw the investment funds.

Applications and redemptions are made on the basis of the net asset value of each unit, possibly with a variation due to fees.

In the case of listed units, the units may be listed for trading on a stock exchange.

In practice this is a similar arrangement to listed shares.

Units may be bought and sold through the exchange, distributions may be paid in a similar way to dividends, and the units may rise or fall in value in line with the trust assets.

In the case of unlisted units, applications or redemptions of any practical size may usually be made, and the unit price does not diverge from the value of the trust assets.

However, a large number of redemption requests within a short period of time may lead to liquidity problems within the trust, as assets such as property cannot be sold within a short period of time.

Listed units may have benefits in simple buying and selling processes and short settlement periods compared to unlisted units.

Also, the trust assets do not need to be sold when a listed unit is sold to another investor.

However, listed units may lead to trading liquidity problems when a large number of units need to be bought or sold, and also the unit price may diverge from the underlying value of the net assets per unit.

2.3.5. Company

Companies are used for most large enterprises, and are also used by sole traders and other businesses.

A company has the benefits of limited liability, the ability to buy and sell the shares, and a clear separation between the business structure and personal assets.

Disadvantages with companies include a greater difficulty in transferring capital into and out of the company, an inflexible distribution of income to different shareholders, and requirements for annual returns, accounts, annual meetings and reports.

2.4. Control

Control of a business involves the ability determine the actions that the business conducts.

Except in the case of a sole trader or a single shareholder company, this involves two or more people.

Several arrangements exist for the control of business activities.

Directions and disputes

In some cases, bitter disputes and power struggles can arise within the operation of a business.

Businesses often involve family members, close associates, and other investors.

Differences in opinion and desires for the future direction can lead to serious problems.

In many cases an investor's entire personal assets may be tied up in the business.

Major differences of opinion may arise as to which courses of action would lead to growth and which would lead to failure and collapse of the business.

In some situations, one investor may believe passionately that one course of action would lead to certain diaster and the loss of the business assets, while another course of action may offer growth for the business.

However, another investor may also believe passionately that this situation exists, however that the first course of action is the correct one, and that the second alternative would lead to disaster.

These disputes may involve multiple court cases and may extend over many years.

2.4.1. Individual Enterprise

An individual enterprise is controlled by a single person.

This may range from a sole trader who operates on a business basis and performs services personally, to large companies developed and controlled by a single individual.

The individual enterprise has the advantage of clear and consistent control.

Disputes and struggles do not arise within the control of the business, which can drain time and energy from management and development of the business.

Individual actions are not in conflict, as they are determined within the framework of a single viewpoint.

A large proportion of successful business are, or originally were, developed as individual enterprises.

2.4.2. Partnerships

Professional partnerships, where each partner performs services personally, generally operate relatively smoothly.

Partners may meet several times a year and vote on issues.

Difference may arise with actions such as expanding or dissolving the partnership, however the partnership agreement generally sets out the decision-making process clearly.

2.4.3. Business partnerships

Partnerships involving a traditional business activity may operate smoothly in two particular situations.

The first is when both partners have almost identical attitudes and approaches.

In any situation one partner would most likely take exactly the same action as the other partner.

Disputes and disagreements rarely arise, as both partners think and operate in a similar way.

Another approach that is sometimes successful is when each partner is completely different.

For example, one partner may perform the sales and marketing, develop contracts, and make arrangements with customers and suppliers.

The other partner may handle the accounts and finances of the business, manage costs and arrange production.

In this case, each partner handles a completely separate part of the process.

This arrangement would require that each partner successfully handled their section of the business, had confidence in the other partner's ability and was willing to stay away from the other partner's field.

2.4.4. Co-operatives & group control

Some business enterprises are formed by groups of people.

These may begin with a strong enthusiasm and clear direction.

In some cases, co-operatives and enterprises operated by groups continue on a long term basis.

However, in many cases problems arise.

As time progresses, views about future directions may grow further apart, and management and control of the enterprise may loose direction as disagreement and disputes increase within the group.

After an initial successful period, disagreements may intensify, some members may leave the group, and eventually the enterprise may be dissolved.

Insurance companies are in industry in which co-operative societies continued to operate for long periods.

Many insurance companies began as co-operative societies, and eventually grew to be massive financial institutions.

2.4.5. Private companies

In private companies, the board of directors is generally composed of the major shareholders in the company.

In the case of private companies, this may range from two or three directors, up to around a dozen board members.

Individual directors may or may not take part in the day-to-day operation of the business.

Decisions are made by discussion, with majority agreement being necessary to carry a vote and result in an action being taken.

In some cases, a shareholder may be a passive investor and may have little interest in the operation of the business.

In other cases, several shareholders may have very strong views and an ongoing struggle may develop for control of the company.

In these cases, control may pass from one person to another over time, or in some cases the business may be split with one section of the business developing in a different direction to the remaining parts of the business.

2.4.6. Public companies

Public companies generally have their shares listed on a stock exchange, and the shares are generally spread among a large number of investors.

Directors are elected at an annual general meeting and may be members of senior management, senior managers from other companies, retired chief executive officers, representatives of major shareholders and non-executive directors.

In these cases, the directors generally have a supervisory role and are not involved in the day-to-day management of the company, although several senior members of management may also be members of the board.

Direction of the business is generally controlled by the chief executive officer, with board authorisation being required for major activities such as buying or selling a large part of the business.

The board generally makes decisions regarding major events affecting the structure of the company, rather than its operations.

For example, takeover offers received from other parties are received by the board, while buying other companies is usually initiated by senior management.

Control of public companies generally operates smoothly, although in some cases a major shareholder or special interest group may attempt to gain several seats on the board, and force a major action such as a merger, de-merger, or other corporate restructure.

2.5. Elements of a business

2.5.1. Cash flow

Cash flow is the payments that are made and received as part of the ongoing operation of a business.

Retailing and services businesses often operate in a high cash flow environment, with large volumes of cash flowing into and out of the business.

Other businesses operate on a transaction basis, with occasional large transactions.

The manufacture of capital equipment is an example of this.

Low cash flow can occur when assets are held within business structures but are not utilised, such as assets passed through inheritance, or when the original business owner has lost interest in operating the business.

Net cash flow can be strongly positive, strongly negative or break-even.

Strong positive cash flow can occur when a successful product or service has been launched that meets with a high demand from customers.

Positive cash flow also occurs during the production phase of a new product, following an initial development phase.

Negative cash flow can occur during the development phase of a product.

For example, the development of a new drug, or the construction of an oil drilling platform may both involve a large capital cost over a period of time.

During the development phase, cash flow is strongly negative, with large payments made but no income received.

After completion of the project, ongoing production costs may be low, and cash flow may be strongly positive.

Negative cash flow also occurs during times of slow sales, and in seasonal businesses where sales occur at particular times of the year.

2.5.2. Capital

Capital is a large block of money.

In a more general sense, capital is a block of value.

For example, a manufacturing plant may have a large capital value, and could be sold in order to raise funds for a different purpose.

Capital requirements

Industries vary widely in their capital requirements.

Service businesses generally have low capital requirements.

For example, a firm of architects may operate with leased equipment and office space, and the business may have virtually no assets.

Mining and large scale manufacturing are capital-intensive industries, and require large amounts of capital to establish facilities.

Sources of capital

In some cases, the business operator may use personal assets to fund the capital requirements of the business.

In other cases, capital is raised through debt and equity.

Debt involves borrowing funds.

This may involve bank loans, or issuing bonds and debentures to investors.

Debt does not alter the ownership or control of the business.

Equity is raised by issuing shares, or by raising additional funds from investors into a partnership or trust.

Equity capital

Equity investors add capital to the business, and become part owners of the business.

In the case of partnerships, trusts and private companies, the new investors and the previous business owners would each become part-owners of the expanded business, in proportion to their shareholdings or contributed assets.

In large public companies however, this has little effect on the control of the business.

In these situations, the share ownership is spread across a large number of investors.

A large public company is generally managed by the chief executive, senior management and board of directors.

Raising capital

Raising capital, either through debt or equity, results in the business becoming a larger enterprise.

This may be done to fund the purchase of another business, for example, or to fund the expansion of existing operations.

Also, raising equity funds is sometimes done when a business is facing financial distress.

Debt payments may be high, cash flow may be negative and cash resources may be low.

In this case, raising equity can be used to repay debt, restore the holdings of cash to manage timing problems with cash flow, and return the business to a firm footing.

Control

In the case of private companies and individual enterprises, raising equity can have significant implications for control of the business.

In this case, the new investors may own a significant part of the business, with the existing shareholders owning a significantly smaller part of the business.

In the case of passive investors who do not wish to participate in the operation of the business, this may not have a significant impact on the development of the business.

In other cases, the new investors may wish to exercise control, which may result in disputes regarding future directions, and change the balance of control within the management of the business.

2.5.3. Margins

A margin is the percentage difference between two numbers.

For example, a business may have income of $10 and expenses of $9, leaving a net income of $1.

This would represent 10% of the income of $10, and the gross operating margin would be 10%.

Some businesses operate with large cash inflows and outflows, with a small margin of difference.

Supermarkets and petrol retailing are examples of low-margin businesses.

These businesses operate with margins of a few percent.

They are high volume, high cash flow businesses with low operating margins.

In other cases, the opposite situation applies, and volumes are low but margins are high.

High fashion boutiques and luxury cars are examples of low volume, high margin businesses.

Volumes and margins generally move in opposite directions, with high volume businesses operating with low margins, and low volume businesses operating with high margins.

A low margin, low volume business would eventually collapse due insufficient income to meet costs.

High margin, high volume businesses generate a strong cash flow and profit.

Due to competitive forces, this situation rarely persists for an extended period of time.

2.6. The three elements of a product

A product may involve three distinct elements; design, manufacturing, and branding.

The design process involves creating the design of the product itself, together with details such as manufacturing methods, distribution paths, pricing and production volumes.

Manufacturing involves producing the actual items from raw materials.

In the case of services, this involves performing the services for the client.

Branding involves the brand name that the product is sold under.

This may be the name and logo of the business itself, or a completely independent brand that is not related to a particular company name or business structure.

A business may perform just one of the three functions, two functions, or the complete set of three functions for a particular product.

A business may also perform different functions for different products.

For example, a manufacturer may design and produce products under its own name, while also performing contract manufacturing for another business's products.

2.6.1. Design

The design process is a project-based activity.

In some cases, a product design may involve a small project or a continuous process over a period of time.

In other cases, a design may involve a large capital expense and involve several years' development work.

A product design is a form of intangible property.

A product design can be licensed to external manufactures, or used for internal production.

A design process involves a capital cost to complete the design.

This may then be followed by an income stream from product sales or from licence fees.

2.6.2. Manufacturing & Services

Manufacturing involves the production of items from raw materials.

Products are based on a design, which may be produced internally by the business, or it may be licensed from another business.

Manufacturing is a capital-intensive activity, requiring equipment, facilities, and stocks of raw materials.

Manufacturing is a continuous process, with net income based on the margin between costs and output prices, less the fixed costs of production which are spread across the production volume.

Services involve performing services for a client.

This is generally a labour-intensive activity.

Net income is based on the difference between fees charged to clients and staff costs, with the fixed costs of the business being spread across the volume of services performed.

2.6.3. Brands

A brand generally involves a name and graphical logos.

Brand names may refer to a business or other organisation, or they may be independent of any particular organisation.

Advertising and promotion is based on brands, together with specific products that carry the brand name.

Brands are often applied to products within a particular market.

For example, separate brands may be used for basic low-cost items, and for more expensive complex products within the same general market.

2.7. Types of business

2.7.1. Primary production

Primary production includes farming and mining.

These industries are capital intensive, requiring large investments in land and equipment.

The output products of these industries are commodities that trade in open markets, with prices that are highly volatile.

Production can also vary widely, due to weather changes in farming, and due to changes in ore composition in mining.

Farming

Farming includes broad-acre production of wheat and grains, raising beef, lamb and chickens, dairy products, wool, market gardens for vegetables, orchards for fruit, and wine production.

Although some farming companies do exist, in most cases farming is carried out by individuals or families.

The business and personal assets are generally combined and may extend back many generations.

Farming is heavily influenced by government regulation.

Many countries have strict limits for agricultural imports, or are completely closed markets.

Subsidies and production quotas exist in many countries, particularly in the United States and Europe.

In some cases, the use of forward sales and futures contracts for agricultural products can be used to reduce the risks of volatile prices.

In many cases, however, efficient production and management can be carried out, but the final result is at the mercy of the weather and the market prices for the products.

Mining

Mines have a limited life span.

Mining includes mining for bulk commodities such as coal and iron ore, precious metals such as gold, silver and platinum, diamonds, and mineral sands.

The non-bulk mining industry in Australia is composed of two major groups.

Several large mining organisations operate a large number of mines around the world, and can trace their operation back a significant period of time.

These organisations use treasuries to manage raising capital, and use financial markets instruments to reduce risks due to price volatility in commodity markets.

A number of small mining companies also exist.

In some cases these companies operate a single mine.

Small mining companies are often formed by raising capital, purchasing a number of mine leases, and conducting geological surveys.

This capital is often consumed quite quickly.

These companies often raise capital on a regular basis to continue operations, or may be dissolved within a period of years or even months.

However, the small explorers can also rise sharply in price if they find a promising geological formation.

Mine management is a specialised area.

This may involve developing a resource map that attempts to identify the structure of the ore within the ground, based on geological information.

The composition of the ore may vary dramatically from place to place, and a mining plan is developed from the ore map to extract the ore in the most effective way.

Managing mining involves scheduling production and maintenance, and altering the mining pattern and plan as the ore body is gradually exposed.

Prices for precious metals are highly volatile.

In some cases mines are closed for a period of time when prices are low, and are re-opened when prices are higher.

Bulk mining is quite different to mining for precious metals, diamonds and other rare minerals.

Bulk mining involves coal, iron ore, bauxite for aluminium and other bulk commodities.

Mining bulk commodities generally involves extracting a continuous body of the commodity.

Production can be varied at will, and the result of the production is a reasonably constant output of the commodity.

Bulk commodities are not traded in open markets, but are delivered into long-term contracts with customers.

For example, coal is used in power generation, and iron ore is delivered to steel mills.

Prices are set by negotiation with buyers, a process that can take months.

Due to the fact that there are a small number of global suppliers and customers, negotiations are complex and intense, and the negotiating power of the parties has a major impact on prices and profitability.

2.7.2. Service businesses

Service businesses charge fees for performing services, rather than for producing and supplying products.

Fees

Fees are charged in a variety of ways.

This can include some of the following arrangements:

- A time-based fee such as an hourly rate.
- A fee for a particular service.
- A regular fee for an on-going arrangement.
- A usage-based fee related to usage of the service.
- A percentage fee based on a transaction size.

For example, a contract administration service may charge a fee per transaction, while an auction service may charge a percentage of the sale price as a fee.

Capital

Service businesses generally have low capital requirements.

Equipment and office space is often leased.

Costs

Services business are generally labour-intensive.

Salaries and other payments to employees are often the major cost, with the difference between income and staff costs being the net income of the business.

Equipment and raw material requirements are generally low, with rental for office space, computer services and utilities being other major costs.

Financial & operating structure

Service businesses are cash flow based businesses, rather than asset-based businesses such as manufacturing.

A service business generally has flexibility to change operations to meet changes in demand for services from clients.

Service businesses generally have a high proportion of variable costs, rather than fixed costs such as equipment and facilities.

This results in net profit varying gradually as the size of the business rises or falls.

In contrast, businesses with a high proportion of fixed costs, such as manufacturing, may have losses when volumes are low, and profit rises as volumes increase.

Problems

A major problem that can develop with service businesses relates to hiring staff and creating a structure where a large proportion of the work that is performed does not relate to the services that receive income from clients.

For example, a large research and product development area may be established.

Although this may be necessary for the long term survival and growth of the company, this could also be a significant drain on the cash flow of the business.

This situation can also arise in more subtle ways.

For example, a contract administration business may employ staff for data entry, computer services, sales and marketing, supervision and management, human resources, corporate strategy and planning, risk assessment and disaster recovery planning and a wide range of other areas.

In these cases, a situation can arise where total staff numbers and costs cannot be supported by the income that is received from services supplied to clients.

This issue is part of the general management and operation of a business, however it may be a particular issue within service businesses.

Operation

Service businesses are relatively simple to establish and operate.

In most cases a service business can be established with a small initial size, which may grow with increasing demand for services from clients.

2.7.3. Project development

Project development businesses involve the construction or development of large items over an extended period of time.

This includes property development, medical drug development, film production, and computer software development.

These businesses require a large sum of capital to meet the costs of development before income is received.

In some cases the income from the project may be received as a sale price when the project is completed.

In other cases, the business retains ownership of the finished product, and then licenses or produces the product over an extended period of time.

Project management is a key element of these businesses.

In some cases the projects may extend over several years, with large sums of money and many complex tasks being involved in completing the project.

Poor project management can lead to large increases in costs over budget, long delays as some tasks cannot be performed until other tasks have been completed in sequence, and the project never being fully completed.

In some cases projects are abandoned after considerable time and cost has been incurred.

This can happen due to poor project management, due to the original concept and design of the project being impractical, or due to unexpected events occurring after the project has commenced.

Financing is another major element of project development.

Project development may involve a strong negative cash flow for an extended period of time, followed by various revenue payments.

Income may appear at different times in stages, it may occur as a lump sum on project completion, or it may be a long-term regular income to the business.

The revenues from the project may be a fixed value, or they may be unknown, due to an unknown demand for the final product.

Project development occurs on a smaller scale within many business operations.

The same stages may be involved, although the project itself may be a small part of the business operation, rather than the primary task performed by the business.

2.7.4. Distribution

Distribution as a business involves transferring goods from one place to another, or from one party to another for sale.

This includes retail operations, importers, and supplying the products of another business to existing customers.

Distribution is a cash flow business.

Distribution has relatively low capital requirements, although a certain amount of capital may be involved in carrying stock.

Distribution businesses are relatively simple to establish, and distribution is a highly competitive business.

Retail businesses generally operate with low margins, which are as low as a few percent in the case of supermarkets.

Within distribution businesses, cost control, stock management and the choice of stock to carry are significant factors.

2.7.5. Asset-based service businesses

Asset-based service businesses involve providing services based on a large capital asset.

This includes Infrastructure assets such as toll roads and airports.

This type of business also includes large capital equipment that is used to provide services, such as some medical equipment.

In these situations, a large capital investment is required to purchase the asset.

This would usually be sourced from funds raised from lenders and investors, rather than personal assets.

Following the large initial cost, a long series of regular and stable payments may follow.

This may involve tolls from a toll road, or payments for the use of the asset.

A solarium is another example of this type of businesses.

A solarium purchases the equipment, and then receives regular income from the clients for the use of the equipment.

Although some minor maintenance and other tasks may be involved, an infrastructure asset is largely a financial transaction.

Once the initial investment is made, there may be very few ongoing costs.

Valuing a business of this type may involve comparing the future income stream to the initial capital cost, using a calculation such as a net-present-value calculation

2.7.6. Small scale manufacturing

Manufacturing involves producing physical items from raw materials.

Small scale manufacturing includes a range of businesses that produce items for sale.

In many cases these may be labour-intensive industries, with much of the work being performed by hand.

Businesses of this type are relatively simple to establish.

Issues within these businesses include finding customers, and developing sustainable markets for the finished product.

Management of these businesses may also be more complex than service businesses.

Manufacturing involves sourcing raw materials from suppliers, managing levels of stock, producing the actual goods and purchasing equipment as necessary.

Small scale manufacturing businesses may continue to operate for long periods of time.

In other cases, they may cease to operate due to lack of interest in continuing the operation, or excessive difficult in finding new customers.

In other cases, a strong demand for the product may appear, and the business may expand in size.

This would generally involve purchasing equipment enable larger volumes of goods to be produced.

As this process continues, the cost per unit gradually falls.

However, the capital requirements of the business also increase. This may involve taking out loans to purchase equipment, or raising investment funds to enable the business to expand.

2.7.7. Large scale manufacturing

Large scale manufacturing is a capital-intensive business.

This includes the production of cars and other vehicles, chemical production, paper mills and so forth.

Major expenses in these cases include the raw materials of production, maintenance costs, and the depreciation of the capital equipment.

Manufacturing on a large scale generally involves producing commodity items.

Commodity items appear in large volumes, with prices set by market forces.

Prices fall to the lowest sustainable level in open markets with low barriers to entry.

Many manufactures operate with low margins, and with a low return on assets.

Managing manufacturing production is a specialised area.

Issues include capacity utilisation, age and efficiency of equipment, fault rates in production, scheduling production, inventory management and sourcing raw materials.

Capacity utilisation relates to the production from the facility.

The production generated during a period, as a percentage of the capacity of the facility, has a significant impact on the profit or loss of the operation.

Issues causing low production output may include:

- A lack of demand from customers.
- Poor production management and scheduling.
- Outdated equipment
- Inventory levels being too low, causing breaks in production.

Fault rates are a major production issue, and reducing fault rates through resigning equipment and changing production processes may have a significant impact on production efficiency.

Raw materials are a major cost of manufacturing.

A reduction in raw material costs through using alternative suppliers, larger volumes, alternative materials and so forth may increase margins.

2.7.8. Pooling Businesses

Banking and insurance are examples of pooling businesses that involve combining a large number of individual items.

In the context of banking, a large number of deposits of various sizes and terms are combined with a large number of loans of various sizes and terms.

This process has two major benefits.

A default on a loan from an individual customer does not have a significant impact on any individual customer.

In the case of a direct loan from one party to another, a default on the loan may result in the entire capital being lost.

A small percentage of bank loans are not fully recovered.

These amounts are an expense of the operation.

Shareholder's capital is retained within the balance sheet as a buffer against bad debts.

The second benefit of banking is that it breaks the link between the borrower and the lender.

This allows borrowers and lenders to transact in various sizes and terms.

For example, many residential mortgages have a term of 25 years, but very few deposits have a term of this length.

Also, funds can be deposited or withdrawn without the need to have another party who is prepared to meet the opposite side of the transaction.

In the case of insurance, the risks of a large number of policy holders are combined into a single pool.

Funds are then set aside to meet the average level of claims.

This provides a facility that allows a customer to make a small fixed payment, in exchange for eliminating the possibility of facing a large individual loss.

Transaction banking, which involves the daily process of cheques, deposits and transfers, is a quite separate business from the loan and major deposit operations of banking.

Transaction banking is a service business.

Pooling business require a minimum size in order to operate.

It is not generally possible to operate a very small pooling fund, such as an extremely small bank or insurance company, as an individual transaction could have too large an impact on the entire funds.

This minimum size issue results in the fact that new banks and insurance companies are created vary rarely, and are often established by existing associations or businesses, rather than as individual enterprises.

Although there have been many mergers, corporate changes and changes in name, many banks and insurance companies within Australia can trace their history back to the earliest days of settlement.

2.7.9. Marketing Organisations

Marketing organisations source products, hold brand names, and organise advertising and distribution.

Businesses using this model do not perform production internally, but use external services and contract manufacturing to produce the products or perform the services.

Some large businesses are effectively marketing organisations rather than manufacturers or service providers.

These businesses usually have low capital requirements, with a small number of staff involved in product design, managing external suppliers and promoting the brand names.

Organisations of this type have a small number of internal operations, however large cash flows may flow through the business, and large asset values may be involved.

Marketing organisations rely heavily on distribution and maintaining the profile of brand names.

This are important issues in all business operations, however there may be limits to the growth that can be achieved simply through brand promotion.

2.7.10. Design and artistic works businesses

Creating designs and artistic works involves a range of businesses including advertising, architectural designs, computer software, music, and film production.

Some of these businesses also fall into the category of project development businesses, or service businesses.

Output may be produced for a specific client or event.

In other cases, ownership of the property is retained, and use of the design or the work is licenced to customers.

In most cases these businesses are labour-intensive with few fixed capital requirements.

However, capital may be required to fund expenses during long projects.

Also, some engineering developments require significant capital for computer resources and testing facilities.

Issues with businesses of this type include the fact that income can be highly unstable and volatile, due to the success or failure of different designs or created items.

2.7.11. Summary of business types

Business Type	Activity	Funding basis	Process	Income
Manufacturing	Producing physical items	Asset based	Continuous	Sales
Services	Performing commercial services	Cash flow based	Continuous	Client fees
Designs & artistic works	Creating designs & abstract items	Capital based	Project based	Licence fees
Construction	Constructing physical items	Cash flow or capital based	Project based	Sales or contract fees

2.7.12. Some industries and businesses

The following table lists some common industries and businesses.

The categories are based on the nature of the business, and the list could also be broken up by other criteria, such as cash flow businesses vs. asset-based businesses.

Some industries cross over several categories, and in other cases, an individual business may be quite bizarre in structure and operation, and may defy categorisation completely.

Primary production		
	Farming	Broad-acre (wheat/grains), beef, lamb & chicken, fruit & vegetables, dairy, wool, wine
	Mining	Bulk mining (coal, iron ore), precious metals (gold, silver, platinum), diamonds, oil & gas
	Refining	Fuel, steel, aluminium, chemicals
Services		
	Professional	Legal, accounting, architectural, investment management, engineering
	Trade	Machinery maintenance, utilities, residential construction, painting, landscaping
	Domestic	Cleaning, home maintenance, childcare
	Personal	Hairdressing, beauty services
	Transport	Road, rail, shipping, travel agencies

	Healthcare	Medical, surgical, nursing, dental, vetenary, hospitals
	Financial	Transaction banking, investment management, financial advisory, valuing, stock broking, stock exchanges, futures exchanges, auction houses
	Industrial	Contract mining, commercial construction
	Business	Secretarial, contract administration, property services
	Hospitality	Restaurants, hotels, motels, function management
	Entertainment	Cinemas, stage productions, film production
	Education	Eduction delivery
Project development		Drug development, computer software, property development, construction
Designs & artistic works		Film production, music, architectural designs, computer software, physical product designs, contract engineering
Distribution		Retailing, importing, cinema, third-party distribution
Asset-based services		Infrastructure (roads, airports), large medical equipment, solariums, gymnasiums
Manufacturing		Crafts, hand-made products, cars & trucks, general manufacturing, equipment

	manufacturing, defence equipment, bakeries, food & beverages
Industrial commodities	Paper, steel, chemicals, wire, piping
Pooling businesses	Banking (loans/deposits), insurance, casinos

2.8. Risk

2.8.1. Risk in business

Operating a business enterprise is a risky activity.

Cash flows may rise and fall.

There may be periods of healthy profits, and other periods of losses.

Investing in projects is also risky, with the costs usually paid in advance, and an uncertain result when the project is finished.

Also, specific events may occur that could cause a negative impact on the business, ranging from a fire in a building, to a sharp rise in the price of raw materials.

Risk management is an important issue in the effective operation and development of a business.

2.8.2. Risk management

Risk management involves managing ongoing risks within business operations, such as volatile prices, and preparing for events that may have a detrimental effect on the business.

Risks that form part of the operation of a business may include volatile prices and irregular volumes of trade.

Specific events may range from fire within a building, to the cancellation of a major customer order, or being sued by another party.

Risk management involves some of the following issues:

- Managing on-going risks such as volatile prices.
- Considering the possible future events that could occur.
- Taking steps to reducing the chance that a negative event may occur.

- Taking steps to reduce the impact on the business if an event did occur.

- Structuring the business in a flexible way that would allow it to adapt to unexpected events.

Care should be taken with considering and preparing for future events, as a false sense of security can be created when this is done.

In reality, the events that actually occur are usually things that were not even thought of.

However, preparing for obvious possibilities, such as fire, and structuring the business in a generally flexible way may reduce the damage to the business under a range of different future conditions.

2.8.3. General risk issues

Prevention

Preventing a problem from occurring in the first place is greatly preferable to dealing with the problem after it has already occurred.

This may reduce costs, time delays, disrupting to the regular business operations, and a wide range of other problems.

Timing of payments

In some cases, financial losses can be recovered from either insurance or legal action.

However, long delays may be involved in both cases.

The financial amounts eventually recovered do not generally compensate for impact on the business of the event actually occurring.

Even when insurance and sound legal contracts are in place to refund any cash losses, steps should still be taken to prevent the events from occurring wherever possible.

Preparation

Most risk management techniques need to be put in place before the event occurs, rather than after it occurs.

This ranges from backup generators and insurance policies, through to the way that the business is structured and operated.

While consideration of risk management issues is important, action is particularly important in this area of business, as steps cannot usually be taken once the event has already occurred.

Creation & Destruction

Creation and destruction are not symmetrical.

Destruction can occur slowly over a long period of time, or it can be extremely rapid.

Creation, in contrast, may be a slow process and can only occur continuously over a period of time.

For example, a building could decay slowly over a period of time, or it could be destroyed in a moment by fire or explosion.

However, a building cannot be constructed in a moment.

It can only be constructed over a period of time.

In a similar way, a business operation is developed over a period of time.

However, a business can be destroyed in a single day, by a fire through a major facility, a court order from a legal action, or the cancellation of an arrangement where a single customer or supplier is involved.

This issue highlights the importance of risk management within business.

Developing a business over the long term involves two actions.

The first is the effective operation and development of the business, while the second is taking steps to prevent major damage to the business from a single event or situation occurring.

Excessive risk management

In some cases, excessive resources are devoted to the issue of risk management.

Expensive backup facilities may be built to cater for events that happen rarely, and where a practical solution to the problem could be determined at the time without a great deal of difficulty.

In larger organisations, complex procedures and detailed plans may be developed, and entire teams may generate large volumes of documentation relating to risk management issues.

Risk management does not need to involve a large amount of time, cost, or complexity.

However, a range of simple steps may prove at a later date to have saved the business from major damage.

Taking risks

Business itself involves taking considerable risk.

In general, there is no possibility of a significant positive return, without also accepting a possibility of a significant negative return.

Costs for equipment, facilities, and projects such as product development must generally be paid in advance, but the income from the activity will not be known until some time in the future.

This is the nature of business and investment.

However, there are also other issues that can be considered. These include:

- Avoiding taking unnecessary risks.
- Avoiding risks that are not central to the operation of the business activity, such as fire risk with buildings.
- Structuring the business to avoid unnecessary damage when changes or events occur.

2.8.4. Specific risks

2.8.4.1. Price Risk

Price risk involves the risk that a business faces due to changes in prices.

In some industries, this is not a major concern.

In service industries, for example, prices may be stable for both costs and the fees charged for services.

In terms of products, coal is an example of a commodity that is sold through long term fixed price contracts with customers, with regular scheduled monthly production.

In some industries, however, price volatility is a major issue.

Input costs can be either stable or volatile, while the prices for the finished products can also be stable or volatile.

The following table lists some combinations, examples of industries, and steps that can be taken to reduce the price risk.

Costs	**Prices**	**Examples**
Stable	Stable	Service businesses
Volatile	Stable	Airlines (fuel prices)
Stable	Volatile	Agriculture, Mining
Volatile	Volatile (set by market)	Petrol refining
Volatile	Volatile (set by business)	Knitted garments (wool & cotton prices)

Volatile output prices fall into two categories.

In the case of prices set by market forces, the business cannot control these prices.

In the petrol refining example, both the input and output prices are volatile prices set by market forces, and this leads to the business margin and profit also being highly volatile.

In other cases, the business can set the output price to pass the changes in inputs through to the customer.

In the knitted garments example, the price of wool is a volatile value, with the price of the wool being included in the final price of the garment.

Methods of controlling price risk include the following:

- Matching the term of long-term customer agreements at fixed prices with equivalent fixed-price supply agreements.
- Maintaining a buffer of working capital to smooth cash flows, with the average of the input prices determining the output price.
- Passing changes in input prices through to the price of the finished product.
- Using financial markets instruments such as futures contracts to set future prices and reduce volatility.
- Maintaining a large inventory, buying when prices are low and using existing stocks when prices are high.

2.8.4.2. Foreign exchange risk

Foreign exchange risk is a form of price risk.

The exchange rate between currencies can be highly volatile, with rises or falls of 10% within a few weeks being a common occurrence.

Raw materials that are imported may result in volatile costs, while the income received from export sales may also be volatile.

Methods of controlling foreign exchange risk include the following:

- Using financial market instruments such as futures contracts to hedge the risk of specific payments.
- Sourcing raw materials from a similar region, or in the same currency, as the location of export sales.
- Maintaining a buffer of capital to smooth the cash flows from expenses for imported materials, and income from exports.
- Altering the prices of finished goods when a sustained increase or decrease in an exchange rate occurs.
- Supplying exported goods at a fixed local currency price, with the rise or fall in exchange rates being borne by the customer. This is the usual practice when goods are ordered directly from an overseas supplier, rather than through a local distributor. This is the source of foreign exchange risk when the business itself orders goods from other suppliers.

Assets held in overseas countries, and debt raised in foreign currencies, both change value in local currency terms with changes in the exchange rate.

For example, a business may own a storage warehouse in a foreign country.

The value of assets that are held in overseas countries may be hedged by raising debt in the same currency.

The debt could be used to purchase the asset, or it could be converted to the local currency and placed on deposit.

2.8.4.3. Volume risk

Some businesses operate with a steady volume of sales, while others have seasonal, cyclical or random changes in sales.

Seasonal industries such as primary production and some retail operations have the majority of their sales at certain times of the year.

Cyclical industries such as residential construction pass through regular periods of high activity followed by periods of low activity.

Random sales occur in some industries, such as film and music production, where sales are highly volatile from period to period due to the success or failure of individual projects.

Some possibilities to reduce the impact of these changes include:

- Maintaining a buffer of capital, drawing down from the capital in slow periods and replenishing it during periods of high sales.
- Operating different activities to allow continued sales during slow periods. For example, a retail outlet may sell snow skiing equipment during winter, and waterskiing equipment during summer.
- Altering billing practices to smooth cash flow. For example, this could involve regular progress payments through a project, or billing expenses directly to a client.
- Where possible, using facilities and services that can be purchased as needed, rather than owning assets and establishing permanent facilities

2.8.4.4. Fraud & mismanagement risk

Fraud and mismanagement risk involves the risk that damage will occur to the business due to the actions of an employee.

This may involve a wide range of activities, such as some of the following:

- Directly withdrawing funds from accounts of the business.
- Purchasing goods or services from suppliers that are associated with the employee at high prices.
- Accepting payments from outside parties to perform actions that benefit the outside party at the expense of the business.

In practice, the greatest risk involves a situation where the employee generates a public appearance of a situation that differs from the actual reality.

This involves a separation occurring between the presented situation and the actual situation.

This may involve presenting false information such as financial results and current holdings.

This may be done by a chief executive operating an entire business, by a trader operating a trading portfolio, or by some other employee.

Over time, the reports and financial statements may become further and further from the actual situation, until a company that appeared to be operating normal suddenly becomes insolvent, with large debts and a collapse of the business.

This situation has occurred in a number of cases, leading to a collapse and liquidation of several large organisations.

This risk can be reduced in some of the following ways:

- Ensuring that regular reporting is detailed and up-to-date.

  Reports that are very late and contain limited details may be a sign of potential problems. This also applies to general management of the business, as well as deliberate falsification.

- Maintaining an internal audit department that reports directly to the board of directors or the business owners.

  This audit department should have authority to inspect all documents and records, and requests to inspect information by this area would override instructions from all other employees, including the chief executive.

- Ensuring that external audits of accounts proceed on the standard basis, that audit reports are received directly by the board, and that action is taken to address serious problems that are raised in audit reports.

- Maintaining an internal trading risk assessment area that is independent of the trading activities, and audits the risk exposure of trading portfolios on an arm's length basis.

- Auditing settlement areas to detect problems such as false accounts, and accounts used to hold loss-making positions that are not included in the standard reporting.

Small enterprises

Auditing is a function of all businesses, no matter how large or small.

In the case of large organisations, external auditors are required for auditing of accounts.

Auditors are generally firms of chartered accountants.

In the case of small enterprises, the business owner may perform the auditing functions.

This may involve checking the books and records, reviewing random transactions, and checking major items such as bank account balances against accounting records.

This process also has the advantage of providing a clearer understanding of the finances and operations of the business.

Auditing within large organisations occurs whenever formal accounts are prepared, generally quarterly of half-yearly. (** check auditing of quarterly/annual accounts).

2.8.4.5. Property & Equipment destruction

Property and equipment loss or destruction involves fires, excessive wear to equipment, and loss through theft.

Prevention

Installing fire alarms, security procedures and other steps may reduce the chance of loss or damage occurring to property and equipment.

This can range from simple security procedures, through to complex and expensive procedures involving on-site security monitoring, fire alarms linked to central monitoring centres, and other procedures.

This issue can rise in profile to a greater extent than the actual risk in some business operations, however all these events do occur, and the risk of these things occurring should generally be considered when operating a business.

Fire is a particularly significant risk.

Destruction of an entire plant, including equipment and fixed facilities, computer equipment, information records, and stores of materials may be difficult for a business to recover from in the short term.

Data backups

Data backups of computer databases and information should generally be maintained on a regular basis.

Data backups are usually stored off-site, to prevent loss in the event of a fire.

Various arrangements are used for backing up data.

As one example, the full data on a system could be copied to tapes each night, with the previous 30 days kept in full, and then monthly records kept prior to that date.

Also, backups should be regularly checked.

Tests should be done to restore information from backup facilities into a main facility, to ensure that the backup information is being stored correctly, contains all the information, and can be accessed.

Data backups frequently do not work when the first attempt is made to restore data from them.

In some cases, large volumes of detailed backups have been kept.

After a system failure, attempts to restore that data showed that all the tapes were blank, that data was missing, or that data was stored in a corrupted format and could not be accessed.

An effective data backup procedure involves many issues and is a significant part of effective systems operations.

In the case of smaller enterprises, data backups may involve a weekly backup of the full system on to tape, with the tapes kept in an off-site location.

Some backup arrangements simply keep a complete record of the current system data, without any backup history.

Although this would be sufficient to restore a system to working order, there are two limitations with this approach.

This system relies on a single copy of the data.

If any data tapes or other storage items are damaged or lost, it may not be possible to restore the data.

Also, backup data systems are also used to retrieve data that has been accidentally deleted.

In the case of a single backup copy of data, the data may be permanently lost if a new backup has been stored on the tape or other media since the data was deleted.

However, in the case of retaining previous backup storage on a long term basis, in some cases the recovery of the deleted data may be possible.

Larger computer facilities can include completely duplicated facilities, with the ability of the system to automatically swap from one facility to another to continue operation.

However, facilities of this type may be expensive, and the cost must generally be balanced against the practical steps that would be needed to restore a system to working order.

Maintenance

Maintenance of equipment and property may prevent an excessive reduction in value over a short period of time.

Although maintenance can be expensive and is a significant cost in some operations, lack of regular preventative maintenance may result in equipment deteriorating at a rapid rate.

Also, adjusting equipment regularly, in addition to scheduled maintenance, may reduce fault rates and production stoppages, and prevent excessive wear to equipment occurring.

Insurance

General insurance is available for most physical items used in business, including buildings, equipment, and manufacturing facilities.

Insurance of this type is usually cost-effective.

General insurance operates in a competitive and open market, and premiums are calculated directly from the probability of the item being lost or destroyed.

Business continuity insurance can also be arranged, to make payments for temporary facilities until equipment and facilities can be replaced.

2.8.4.6. Legal Issues

Clear legal documentation is important for several reasons.

This may avoid problems with misunderstanding and confusion, different perceptions, and memories when events occurred a significant period of time in the past.

Also, legal action is common in business, and in general a business of any significant size must expect that legal action will be taken against it at some time or another.

Although the legal system can be slow and expensive, in some cases this is also the only practical approach in attempting to recover losses due to defaults on payments and contracts.

Commercial disputes with customers, suppliers and other parties generally pass through an extended period of discussions, letters, and all other attempts to resolve the situation before legal action is initiated.

Documentation

The most important issue involving managing legal issues is to ensure that simple and clear documentation is produced for each arrangement involving the business.

This includes loans, contracts with customers and suppliers, funds invested in the business, and employment agreements.

Documentation does not need to use legal terms, or be particularly formal or detailed.

All that is generally required is a list of the key facts, with the two parties signing the agreement.

This is also good business practice in the management of a business operation, in addition to addressing legal issues.

In more complex cases, such as trust deeds and mortgages over property, a solicitor would normally be consulted to draw up documentation.

Insurance against legal action

Insurance can be arranged to meet the payments that may be required when being sued under several types of legal action.

(** check details of insurances/liabilities)

This includes:

Public liability	Legal action taken by customers or other members of the public against the business, such as a customer injuring themselves while on the business premises.
Professional indemnity	Legal action regarding negligence, as a director, trustee, professional service provider or other situation where the business or individual is sued for negligence.
Worker's compensation	Compensation payments for employees injured while working within the business operations. Separate issues arise

in relation to negligence of the business operator.

Prevention

Prevention of a legal situation arising is a far better result that dealing with the problem after it has already occurred.

This involves the general efficient and effective operation of the business, such as delivering products and services to customers according to specifications and within the time period specified, and meeting payments to suppliers as they become due.

Possession

Although the legal system supports and enforces binding contracts, in many practical cases, physical possession of items or funds has greater importance for the business.

For example, if a large item of equipment was delivered to a customer, and then payment was not made, legal action could be taken to recover the payment.

A court would generally consider that a contract was in place, and would generally issue a court order that payment be made.

If the payment was still not made following court orders, this could proceed to a bankruptcy or liquidation of the customer's assets and to repay the outstanding debts.

However, this process could take months or even years, with large costs involved until the case was determined.

During this time, the business would have neither the funds nor the equipment, which could cause major cash flow problems.

In some cases, a business becomes insolvent and is liquidated, before the court judgement is finally made in favour of the business some time later.

The potential risk of these problems arising can be reduced by using methods such as deposits, progress payments during project development, and other

approaches that consider the physical possession of the property as well as the legal status of the situation.

2.8.4.7. Project risk

Project risk relates to the risk that some of the following events may occur:

- The project is not completed on time.
- The project cannot be completed without additional funding above budget.
- The project fails to produce its goal, such as research to develop a new technique.
- The completed structure does not match the specification for the product.
- The project becomes a continuous process, without any clear progress or completed items being produced.

The end result of the project may be also be unsuccessful, however this is a separate issue from the risk of completing the project itself

Project management

Effective project management is the major issue in avoiding project risks.

This involves developing a schedule and project plan involving the tasks to be completed, the time frames, and the order of various tasks.

Managing the project then involves changing the order and timing of tasks as the project progresses, and ensuring that the project remains on schedule and within budget.

Commencing projects

It is important to not commence a project unless there is sufficient funding to see the project through to completion.

This relates to the business continuing to operate and develop on an effective basis.

More importantly, the moment that a project commenced, the project moves into significant negative territory.

If the project continues through to completion, the situation may return to the previous conditions before the project commenced.

However, if the project fails mid-way through, major losses may be incurred.

This occurs because of the fact that a partially completed project often has little or no value.

For example, an apartment building may be constructed for residential use.

The project may be partially completed, however there may be insufficient funding to finish the project.

In this case, the only option would be to sell the project to another business, which would complete the project and sell the finished building.

In many cases a buyer may not be available, while in other cases a low price would be paid, due to the costs and complexity involved in taking over the project.

A project that is 100% completed may have a value of 100% of completed value, however project that is 90% completed may have a value of only 20% of the final value, for example.

Commencing projects that are fundamentally too large for the business to fund is a common source of business operations ending and businesses being liquidated.

Project results

A problem that sometimes occurs with projects is that the finished project does not match the requirements that the client was expecting.

When the time and expenses have already been spent by the time the project is finished, it is then too late to alter the design.

This is a major source of legal action in business, with the client attempting to recover costs from the developer, and the developer attempting to recover full payment from the client.

These problems may be reduced by following several steps.

This includes:

- Ensuring that the original specifications are detailed and cover all areas, and are signed by the client before development commences.
- Demonstrating mock-ups, models and prototypes to the client, to ensure that the design matches the client's expectations.
- Ensuring that the client reviews progress at several stages through the project, so that the direction of the project can be changed at an early stage if necessary.
- Ensure that progress payments are received during development, to reduce cash flow problems if later court action results in long delays before final payment is received.

This issue arises with the business being either a client of an external service provider, or a developer of a project for an external client.

Staged development

Staged development may significantly reduce project risks.

In this arrangement, a large project is divided up into several independent stages.

The first stage may be completed, and in some cases sold, before later stages are commenced.

This approach also enables the business to make a decision on a future date, mid-way through the project, when conditions may have changed significantly.

Progress payments

In the case of internally funded projects, such as developing new products, income from the project is not possible until the project has been completed.

However, in the case of projects developed for clients, various payment methods can be used to reduce the risk of cash flow problems.

These include payments at regular periods, payments when project milestones are reached, and expenses billed directly to the client with a fee charged for organising and managing the project.

2.8.4.8. Risks due to financial structure

2.8.4.8.1. Debt

Excessive debt can be a major source of risk to a business.

Most businesses have some debt.

This may be debt that was raised to purchase equipment, to fund expansion into new areas and markets, or for working capital requirements when large payments must be made before income amounts are received.

One scenario may involve a business purchasing equipment to expand operations, while at a later date a period of slow sales occurs, asset values and cash flow decline, and the business is left with a large debt and serious financial problems.

Businesses with stable cash flows can generally sustain higher levels of debt than businesses with volatile cash flows.

This includes examples such as property and infrastructure investment, and general business operations in stable markets.

Business with unstable and irregular income can sustain only lower levels of debt.

Examples include project developments such as film production and biotechnology, and start-up operations with negative cash flow.

Two major measures of the debt level are a “gearing” ratio and an “interest cover” ratio.

Gearing can be calculated in several ways, with the ratio of debt to total assets being one approach.

Gearing values using this calculation are often within the 20% to 50% range.

A gearing ratio of 30%, for example, indicates that 30% of the business assets are funded with debt, while the remaining 70% of the asset value is equity of the business.

Gearing levels of significantly above 50% may suggest a risk exposure to high debt levels.

Of more direct relevance is the interest cover ratio, which measures the proportion of income that is required to meet debt payments.

This is calculated from the net income before interest and tax, divided by the interest expense.

Values below five may suggest a risk due to high debt levels, with an interest cover ratio under 5 suggesting that more than 20% of net income is used to meet interest payments.

In these cases, action could generally be taken to reduce debt levels before a serious problem developed.

This may involve raising additional equity funds from investors to repay debt, reducing or cancelling dividends until debt was reduced, and postponing major expenses such as development projects.

The general effectiveness of the business structure and operations may also impact heavily on the cash flow available to reduce debt levels.

2.8.4.8.2. Margins

A business that operates with narrow margins may be at risk of negative cash flow if costs rise slightly or sales fall.

For example, a business may have income of $100 for the year with expenses of $98, for a net income of $2.

This margin of 2% is a low figure, however some industries such as petrol retaining and supermarkets operate with margins of only a few percent.

In this case, if expenses were to rise from $98 to $99, or income was to fall from $100 to $99, then net income would fall by half.

Industries that operate with low margins generally also operate with large volumes.

Within other industries, the average margin may be high.

This applies to low volume sales of customised products, for example.

If the margin of the business is low, or is significantly below the industry average, then this may present a risk to the business.

This can be managed through careful cost control.

In cases where the margin is below the industry average, this may involve increasing prices, reinvestment in new facilities, or a range of other changes to restore the margin to a more sustainable level.

2.8.4.8.3. Fixed Costs

Fixed costs are expenses that do not change when the volume of production changes.

These include building rents, depreciation of equipment, and general administration costs.

Variable costs change with production volumes and include costs of raw materials, and possibly external services.

The ratio of fixed costs to total costs can be calculated over a period of time, to determine the proportion of costs that cannot be reduced if sales fall.

Figures such as these can also be compared to industry averages.

A business with a high proportion of fixed costs generally implies that a large and complex production facility has been created.

This may be a physical manufacturing plant, or it may be an organisation that processes a large volume of services.

This represents a risk to the business if sales should fall, as the fixed costs cannot easily be reduced to match the fall in income.

Overcapitalisation occurs when a facility is created that has a capacity that is greater than the underlying demand for the product.

In these cases, alternatives could include expanding sales into a wider geographic region, such as export sales, creating new products to use the capacity of the facility, and performing contract manufacturing or services for other businesses.

In other cases, new investment may be required to reduce fixed costs, or marketing efforts may need to be increased to ensure that the production facility is fully utilised.

2.8.5. General risk management

General business risks involve a wide range of circumstances that could have a detrimental effect on the business.

A number of approaches can be used to structure the business operation so that the potential impact of these events on the business may be reduced.

2.8.5.1. Backup facilities

Backup facilities can be used to allow businesses to continue operation when an existing source of supply ceases to operate.

This may be a supply of raw materials, the data storage within a computer facility, or the cash flow from sales.

Backup facilities include the following:

- Funding supplies, including credit facilities such as overdrafts, cash balances, and holdings of liquid assets such as shares.

  These can be used to handle cash flow problems due to expenses being due before income is received, a large payment being required such as an equipment replacement, or generally poor operating conditions.

- Back up of computer data files.
- Back up computer hardware facilities.
- Spare items of equipment, split facilities, and using several machines rather than one large one to allow production to continue when equipment is temporarily unavailable.
- Arrangements with alternative suppliers

Testing backup facilities is an important issue.

Backup facilities that are not operated regularly may not function if the primary source fails and the backup facility is required.

For example, data backup tapes should be restored to a main system on a regular basis, backup generators should be regularly started, and arrangements with suppliers should be regularly confirmed.

One alternative to reduce these problems involves operating the backup facility as part of regular operations.

For example, small quantities of goods could be regularly purchased from a backup supplier, to ensure that account details, shipping arrangements and product supplies where all operating correctly.

In the case of alternative facilities, some arrangements involve switching from a main facility to an alternative facility on a regular basis, to ensure that both facilities are fully operational.

Another hardware arrangement may reduce the risk of backups not be available when they are needed may involve the backup facility being permanently connected to the main facility, rather than being switched in when a problem occurs.

This approach may also reduce the need to detect error conditions and switch arrangements.

For example, the failure of the main system may lead to supply being automatically drawn from the alternative source that is connected within the supply system.

Battery backup systems that are permanently connected in the supply circuit may be an example of this approach.

Some financing arrangements, such as overdrafts on cheque accounts, could also be considered to be a structure of this type.

2.8.5.2. Offsetting risks

In some cases, a new risk can also be taken on that partially cancels an existing risk, by operating in the opposite direction.

For example, an agreement with a customer may be signed to supply a product at a fixed price for a fixed period of time.

This would create a risk if input prices rose or supplies became unavailable.

Signing a fixed supply agreement also creates a risk, as the business would receive supplies for a fixed period of time, regardless of whether or not there was a demand for the final product.

However, because the initial agreement to supply the product was in place, this second risk would offset the first risk and lead to a reduced total risk.

As a more direct example, an overseas property such as a storage warehouse may be purchased.

The business would then be exposed to changes in the value of this asset due to changes in the value of the currency exchange rate.

However, if a loan was taken out to purchase the building in the same currency, rather than the local currency, this would offset the risk of the building.

Both the loan value and the building value would rise of fall at the same time, leading to a reduced change in the net difference between the two.

Offsetting risks may create a false sense of security in some circumstances.

For example, risks rarely offset exactly, and two risks that appeared to offset each other may only partially offset at times.

Also, other parties may default on contracts, and situations may arise that lead to one of the risks disappearing, while the other remains in place.

In the warehouse example, if the warehouse was destroyed by fire, then the exposure to the debt would suddenly appear as a major risk exposure.

This problem is particularly significant when one risk disappears and the other moves significantly at the same time, before the second risk can be unwound.

This problem sometimes occurs in investment trading portfolios and hedge books used to manage risks such as foreign exchange, interest rate and commodity price exposures.

In the case of offsetting risks, the individual risks remain in place and should be borne in mind as well as the total net position.

However, offsetting risks can lead to a drastic reduction in the net risk to the business.

2.8.5.3. Single Vs Multiple arrangements

A major source of risk may occur when a business is reliant on a single customer or supplier.

This creates a dependency between each party that prevents either party from operating independently.

Also, this creates a major source of risk to the business in the event that the other party ceases to supply goods or order products, for one reason or another.

In some industries this is unavoidable, in cases where the industry is consolidated into several major operations.

This occurs within industries that benefit from economies of scale, where the industry consolidates into several suppliers, with large volumes and low per-unit costs.

Were it is possible, however, developing a wide customer base and sourcing supplies from several suppliers may have a significant impact on the business.

This would allow the business to act independently of the actions of any particular customer or supplier.

This may also smooth cash flow, and greatly reduce the impact on the business of a customer cancelling orders, of a supplier ceasing to supply.

This principle is the basis of the operation of markets of all kinds, insurance portfolios containing many individual risks, and investment portfolios using a range of investments to diversify the portfolio and reduce the volatility of returns.

2.8.5.4. Single-product risk

Many businesses operate successfully for long periods as a single-product company.

The product may be a computer program, a specialised item of equipment, or a particular service.

In these cases, the business itself may be built around the product.

Cash flow may be steady and sustainable, with a stable market of customers.

However, all products have a limited life, and gradually loose relevance as the world around them changes.

A product may be continually updated and changed, but as time goes by, the underlying structure of the original product becomes less and less suitable as a basis for the product.

This situation also presents a risk to the business if a competitor were to unexpectedly release a product that performed similar functions.

In the case of single-product businesses, using the available cash flow to develop new products or services may reduce the risk of a long-term decline, or sudden collapse, in the operations of the business.

However, developing a large number of products also has problems.

Product development may be a slow and expensive exercise.

Multiple products may require a wide range of raw materials, complex administration and production, high maintenance levels, and low volumes per product.

Operation may be simple and efficient when a large volume of a few products is made, rather than small volumes of many products.

Developing completely new products on a regular basis may allow the business to continue a sustainable operation over the long term, rather than gradually declining over time.

2.8.5.5. Flexibility

Flexibility is fundamental to survival.

Unexpected events occur from time to time, while the structure of industries and the economy is constantly changing.

Flexibility allows the business to adapt to changing conditions, and reduces the chance of insolvency when adverse events occur.

Some alternatives for maintaining flexibility include the following:

- Leasing premises rather than purchasing property.
- Maintaining short-term or medium-term leases.
- Avoiding long-term fixed-price contracts with customers or suppliers.
- Maintaining cash balances and credit facilities to allow transactions to be undertaken.
- Including options within contracts, such as a two year building lease with an option for a further two years.
- Using external services rather than internal services.
- Leasing equipment to allow capital to be kept in more liquid forms such as cash balances and tradeable securities.
- Avoiding long credit terms and long-term fixed rates, such as offering long credit terms to customers, or using fixed interest rates for long term loans.

2.8.5.6. Insurance

Insurance can be used to reduce the impact of certain events.

Insurance within the business context falls into several categories.

General insurance covers physical items such as equipment, buildings, production facilities and inventories of materials.

Legal liability insurance covers payments that may be required due to court action against the business.

Other insurances include business continuity insurance, which involves payments to arrange temporary facilities in the event of a major problem such as a fire.

In this case, the insurance policy makes payments to allow temporary facilities to be arranged, equipment to be hired, and raw materials to be purchased to allow the business to keep operating until the full facilities are restored.

Insurance premiums are calculated according to the probability of the event occurring, and the size of the payment that would be involved.

Insurance in the commercial context is generally a competitive industry, with insurance being cost-effective in many cases.

In some areas, certain types of insurance, such as legal liability insurance, can be expensive due to a large amount of litigation and large payments that may be involved.

Various steps can sometimes be taken to reduce the risk of an event occurring.

For example, a fire alarm may be installed in a building to reduce the risk of the building being destroyed by fire.

In some cases, the premiums of insurance policies may be lower when steps such as these are taken, due to the lower risks.

Examples of insurance include:

General insurance	Equipment, stock, buildings, vehicles, manufacturing facilities.
Legal Liability	Public liability (accidents, defective goods), Professional indemnity (negligence as a director etc) Worker's compensation
Other	Business continuity

2.8.5.7. Long-term agreements

Long term agreements can represent a benefit or a risk to the business.

This applies to customer supply contracts, supplier arrangements, property and equipment leases, and so on.

In one example, a steady stream of customer orders may be received from a range of different customers.

However, the business may have continual problems with supplies, with suppliers delivering goods in various quantities at different times, with frequent shortages.

In this circumstance, a medium term agreement with a supplier for stable supply volumes may have considerable benefit to the business.

Also, in cases where long-term agreements can be made with both suppliers and customers, this may provide a period of stable cash flow.

Stable cash flow would allow additional risks to be undertaken, such as a new project development or a higher level of debt.

In general, however, long term agreements may represent a risk to the business.

Industries, the economy, and individual businesses change continuously.

Expected events may also occur that may require a significant change in the direction of the business.

Long term agreements may prevent the business from adapting to changed circumstances.

All else being equal, a long term fixed arrangement carries more risk than a shorter-term fixed arrangement.

More changes may occur over the term of a long-term contract, and if the contract becomes unfavourable, a longer period of loss may occur until the contract expires.

In general, flexibility is improved when long-term agreements are avoided.

2.8.6. Summary of risk management

Some of the following methods can be used to reduce the impact that at an event may have on the operations of the business.

Risk Transfer	Insurance, financial markets options, setting output prices to input prices plus a margin.
Risk Impact	Flexible operations, backup facilities.
Risk Probability	Prevention, for example, fire alarms, equipment maintenance, accurate supplies to customers, project management.
Risk Offsets	Futures contracts, sourcing supplies in the same currency as exports, holding debt in the same currency as asset exposures.
Risk Splitting	Board customer bases, multiple suppliers, several products, staged developments.
Risk Defence	Legal documentation

2.9. The economy, industries and change

As time passes, some industries decline in size, while new industries appear.

This can be due to new technology and to changes in social conditions.

Many products have an underlying demand within the economy.

As new technology is developed and implemented, the products may be produced using fewer and fewer resources.

For example, agriculture was once a major part of the economy.

The number of people involved in agriculture, and the amount of resources needed to grow food and produce other agricultural products is now quite small.

New technology often results in reduced input materials for the same volume of production, and reduced manual input.

New waves of technology may lead to unemployment, as the existing demand is met with fewer resources.

However, new industries then spring up in place of the work that was performed before.

For example, when steam power was first widely used, knitting machines produced woollen garments in a short period of time for almost no cost aside from the wool.

Previously, a large industry had been involved with large numbers of people knitting garments by hand.

This change lead to widespread unemployment.

Factories were attacked, and armed guards were stationed beside the machines.

The word “sabotage” is derived from the word “sabot”, which is a type of wooden shoe.

The sabot were thrown into the machines to break the equipment and prevent production.

Over time new industries arose, although this did not occur immediately.

At the time of writing, banking is changing from a labour intensive industry to a technology intensive industry.

Mining is declining in size as a proportion of the economy, as improvements in technology enable the same materials to be mined with less cost and input than in the past.

Mining was originally a labour intensive industry, but is now a capital intensive industry, with few employees operating large and highly efficient mining equipment.

At one time, mining companies comprised around 80% of the capitalisation of the Australian stock market, however this has now declined to around 15%.

Labour-intensive industries tend involve a large number of small and mediums sized organisations.

Communication, administration and management within labour-intensive businesses becomes more difficult at the size of a business grows.

In contrast, capital intensive industries tend to consolidate into a small number of large organisations.

The is due to the fact that the fixed costs, such as manufacturing facilities and mining equipment, can be spread across a larger number of items when high volumes are involved, leading to lower costs per unit for high volume production.

Service businesses are the growth sector of the economy.

This is related to the fact that the underlying demand for physical products is now being met using a small number of employees, involving high volume facilities and advanced technology.

This effect also occurs within industries that previously employed a large number of staff to perform manual administration, and where computerised processing is now heavily used.

Banking and insurance are examples of this.

These changes may have allowed new industries to appear, due to production of physical products no longer requiring the activity of large numbers of employees.

The structure of the economy changes constantly, although this is a long term and gradual change.

The structure of an industry may impact the strategy and operation of a business.

A business operating in a declining industry may need to regularly buy other business, consolidate operations and expand volumes in order to remain profitable.

A business operating in an expanding industry may find that competition is intense, and that constant new product development is required in order to prevent falling behind the development of the industry.

2.10. Employment

Most businesses employ staff in one form or another.

Employees are hired to perform a wide range of tasks.

In manufacturing, employees are hired to operate machinery, schedule and manage production processes, and liaise with customers and suppliers.

In building construction, employees are hired for manual labouring, trade services, and general construction.

Services businesses employ staff to provide services to clients, maintain computer services, and produce marketing material.

General administration involves making payments, processing transactions, and recording information such as current arrangements with customers.

Operations are managed in various ways.

Supervisors oversee the work of employees who are not experienced in the task being performed.

This may prevent problems arising due to mistakes such as information being processed incorrectly.

The supervisor also acts as a reference point for technical issues and problems that arise.

Team leaders manage the operation of a team.

This includes building the team, and hiring and firing members of the team.

The team leader is generally experienced in the task being performed, and performs the work on a day to day basis along with the other members of the team.

The team leader ensures that projects remain on schedule, or that workloads are being met.

Teams may be composed of several employees performing the same task, such as a team of engineers working on a large project.

In other cases, several different skills may be involved.

For example, a team comprising a marketing person, the product manager, and a technical staff member may be assembled to create a proposal for a presentation to a potential client.

Operational management involves organising the activities of the business.

This may involve assigning teams to projects, hiring and firing employees, negotiating with suppliers, and handling problems that arise with the operation of the business.

Project management involves planning and managing specific projects.

A detailed project plan may be produced containing a list of tasks that are required to complete the project, together with the order and timing of each of the different parts of the project.

Multiple individuals or teams may be involved in working on an individual project.

Managing the project may involve re-scheduling tasks as events unfold, handling problems with supplies or information from external parties, and changing resources as the project progresses.

Strategic management involves planning the future direction and development of the business.

This may involve planning the major product areas and markets that the business will operate in, closing and forming business units, negotiating for the purchase of other businesses or forming joint ventures with other companies, and planning the financial structure of the business.

In some small enterprises, an office manager is employed to perform general administration, order supplies and maintenance, and keep basic accounts.

Types of employment

Permanent employees are hired as part of the day-to-day operation of the business.

Temporary staff are employed to fill in for other employees who are on leave, or during times of peak workload.

Contract staff are hired to complete a specific project, or during medium term periods of high activity.

Payment

Contract and temporary staff are generally paid according to an hourly rate for hours worked less breaks.

In some cases, a daily rate may apply.

Permanent staff are generally paid a fixed annual salary.

In some cases, particularly in some small-scale manufacturing operations, payment may be based on a fixed amount for each item produced or for each task performed.

Remuneration can include non-cash payments such as the use of a car.

In general the total remuneration is a fixed dollar amount.

In some cases, an employee may chose to take the full amount in cash, or a mix of cash and other benefits such as a car lease.

Bonuses are used in some remuneration arrangements.

These are lump sum amounts, rather than regular payments.

A bonus is usually optional, and is linked to a formula based on some measure of the results achieved by the employee, team or company.

Sales staff are sometimes paid on a commission basis, which may include a base salary, and a percentage commission of each item sold.

Organisation structures

Employing staff is expensive. Payments to employees are a major cost item in most businesses. In some service businesses, staff costs form the bulk of the expenses.

In addition to direct payments, costs of office space, computer equipment, and training may be required.

As a rough rule of thumb, the total cost of employing a member of staff may be approximately double the direct salary cost.

An intangible cost also applies to businesses that develop complex organisational structures.

In these cases, the business may loose direction and clarity.

Large numbers of departments may interact in a wide range of different ways, costs may become very high, and the actual products or services produced by the organisation may bear little resemblance to the resources that are involved in the enterprise.

2.11. Business models

In some cases a business enterprise is based on a single clear business model.

In other situations, a range of different activities may be carried out, and a range of different products or services may be offered.

In larger organisations, separate internal operations may exist.

For example, an organisation may have an internal manufacturing operation, and administration area that charges other business units on a contract service basis, and a development operation that produces designs for new products.

2.11.1. Fee for service

Fee-for-service involves charging fees for performing specific services.

This is a common business model in service industries, among sole traders and in partnerships.

In some cases fees are based on an hourly rate for work performed, while in other cases a fixed fee applies for specific services.

Services may be directly performed by a single individual.

In other cases, the task may involve a range of different people within an organisation.

Fee for service generates a regular cash flow.

Although the cash flow may vary significantly from time to time, due to changing demand for services, large inflows and outflows are not part of the financial structure of the business.

Businesses operating on a fee for service basis can generally adapt to changing conditions.

Fee for service at an hourly rate is not a scalable business model.

Supplying an increased volume of services generally involves hiring a larger number of employees.

Fee for service is scalable in cases where the fee is based on a percentage of the transaction size, rather than a time-based charge.

2.11.2. Production and sale

Manufacturing operates on the basis of producing goods for sale.

This involves purchasing raw materials, production of goods, and sale to customers.

A wide range of different enterprises operate according to this business model, ranging from handmade crafts to heavy engineering.

Production and sale requires capital to support the purchase of equipment, production facilities, and raw materials.

These operations cannot adapt easily to periods of low sales.

Fixed costs such as building leases and equipment depreciation continue regardless of the level of production and sale.

Production and sale is a partially scalable business model.

The fixed costs of product development and facilities may not vary with the level of production.

In cases where a product meets with a high demand from customers, production may be increased by expanding production facilities, while retaining the original product design and production methods.

2.11.3. Project development

Project development as a business model involves managing projects and developing large customised items.

This includes the development of computer software, commercial construction, and film production.

The project may be retained by the business, and licensed to customers on an ongoing basis.

In other cases, the project is developed for an external client.

In the case of projects developed for clients, payments may include progress payments at various stages of the project, or a single payment at the completion of the project.

In some cases a project may be developed internally for sale, and a customer located after the project is completed.

The work itself may be performed by employees of the business, or by external contractors.

Funding for the project may be based on progress payments from a client, cash flow from other business operations, of a sum of capital raised at the beginning of the project.

Project development requires specialist project management skills.

This business model may also involve reasonably complex financial management, as a project may involve large negative cash flows at certain stages and positive cash flows at other stages.

In cases where a project is developed internally for later licensing or sale, significant levels of capital may be required to fund the costs of the development.

2.11.4. Contract services

Contract services involve performing a regular service, rather than performing individual services.

This differs from fee-for-service, which involves separate individual transactions.

Contract computer support and contract administration are examples of businesses that operate on this business model.

Payment may be based on a fixed monthly fee, or a fee based on the number of tasks performed.

For example, a contract administration service may charge fees based on the number of transactions processed during a period.

Contract services generate a regular cash flow that may be more predictable that an ad-hoc fee-for-service basis.

Costs and processing efficiency may be significant issues within contract services, as alternative suppliers are generally available, and fees rates may be low due to competition with other service providers.

Also, in many cases an organisation has the option of setting up internal services if this would be more cost-effective that using the contract service provider.

Large volumes are a significant factor in the success of contract service businesses, as this allows the fixed costs of the business to be spread across a larger number of transactions, which enables fee rates to be lowered.

This would also allow higher capacity equipment to be used, which would generally result in a lower cost per item.

2.11.5. Development and licensing

Development and licensing involves creating designs and artistic works.

This includes fashion design, architectural plans, music, and computer chip design.

In some cases these designs are sold, however in most cases they are retained by the developer and licensed.

The design may be used for internal manufacturing of products, or it may be licensed to outside manufacturers.

A business built on this business model may have a highly unstable income.

In many cases the final demand for the product cannot be known, and designs and creations that would be expected to be successful are met with a total lack of interest from manufacturers or the general public, while in other cases designs may be unexpectedly successful.

Businesses of this type require funding to support the ongoing costs of development, with revenue being unpredictable and unstable, and revenue from projects not being available until the project is completed.

Funding may come from licence fees received from previous developments, cash flow from traditional business operations, or a capital fund that rises and falls with changes in income.

In some cases, a design or work may be created by a single individual in a short period of time.

In other cases, a large project may be involved extending over several years.

Large project developments can be extremely expensive.

Creating the design of a new car, for example, may cost over a billion dollars. (** check details)

This simply relates to the engineering and design work involved in creating the finished technical design, and does not involve manufacturing or production.

The development of new drugs is also an extremely expensive task, and may take a decade from the initial investigations through to actual production.

The costs of development such as these are recovered through the income from the sale of the product itself.

This may be manufactured by the business itself, or come from license fees charged to outside manufacturers.

The costs of manufacturing a single medical tablet or music media, for example, is very low, with the majority of the price being used to recover the costs of creating the design, rather than the costs of raw materials or production.

Financial analysis of projects such as these can be based on a net-present-value approach.

This method compares the capital cost of the development with the present value of the future income stream from sales or licence fees.

2.11.6. Franchising

Franchising is a business model that involves the franchise business developing a range of product or services, and a business name and profile, and licensing independent operators to use the business name and products.

Income for the franchise business is based on fees from the independent operators.

The operators run an independent business, and pay a license fee in exchange for the right to use the business name, and purchase the products or perform the services according to the model developed by the franchise business.

Franchising as a business is a scalable business model, and is similar to licensing music or computer software.

Franchising is most applicable to businesses that operate in a limited area, with the same operation being performed in a wide range of locations.

Examples include home maintenance services and retail stores.

2.11.7. Diversified businesses

Diversified businesses are large business enterprises that include a wide range of different business operations within their structure.

This business model was popular during the 1980's.

At the time, the view was that this approach would reduce the risk of the business operation.

Investing in a range of different operations would allow the business to avoid serious problems if a major business unit was affected by external events.

However, this approach was not particularly successful.

Some of these companies became very large by the end of the 1980's.

By the end of the 1990s, however, most had either collapsed, or had gradually sold business units over the decade until there was little left of the original company.

There are two major problems with diversified businesses.

The first relates to a general principle of diversification.

As the number of individual elements grow, a number of successful, unsuccessful, and average results appear.

With an increase in the number of individual components, the total result simply becomes the average across all industries, without any scope for the business to be above, or below, the average return of the economy.

Also, the attention and skills of the management team become spread across a large number of different activities, and there is little scope for any value to be added to the business operation by the senior management of the enterprise.

Single-purpose companies have been the successful business model over the 1990's, as these companies can focus all their attention on a single type of business activity.

However, the principle of diversification remains one of the foundation principles of finance.

This approach is used in a wide range of areas within business and investment, from the structure of investment portfolios, to the development of multiple products and wide client bases.

2.11.8. Sub-leasing

Sub-leasing is used when a business operates a facility and leases parts of the facility to other business operators.

An example of this would be some fruit and vegetable markets.

The market operator would own or lease the premises, organise promotion and co-ordinate market sessions, and then charge a fee to individual stallholders for operating within the market.

This model is also used in some retail operations.

For example, in department stores the employees in most areas of the building are employees of the department store operator.

However, the employees within the cosmetics areas are employed by the cosmetics houses, not the department store, with the cosmetics house paying fees for the use of the floor space within the building.

2.12. Structural Value

An operational business may have a value that is higher than the value of its physical assets.

In fact, this is usually the case.

This additional value of the business could be termed the business's structural value.

This is the value that has been created from the way that the business activity has been arranged, and from the way that it is managed.

For example, a service business may lease office space and equipment, and could operate, in theory, with zero assets.

Expenses would be paid for rent, materials and salaries, while income would be received from clients.

If the business was operated successfully, it may have a positive net income, and a positive value as a business.

However, there may be few physical assets owned by the business.

Net operational value

The term "net operating value" could be used to describe the value of a business when it is operational.

This is the value that would be received from selling the business, or paid by the buyer to purchase the business.

This includes the value of the business's net accounting assets, and also the structural value.

For example

Assets	$100	
Liabilities	$30	
Net Assets	$70	- balance sheet assets
Structural Value	$15	- value as a "going concern"
Net Operational Value	$85	- value of the business

Attributes of structural and operational value

The structural and operational value of a business are not included within the standard accounting financial statements.

However, the net operational value could be estimated from a valuation of the business, or the "market capitalisation" of a listed company.

The structural value would then be the operational value, less the net assets from the balance sheet.

Structural value disappears in the case of a liquidation.

When a business ceases to operate, the structural value falls to zero, and the value of the business becomes the liquidation value of the net assets.

The structural value can be negative.

This occurs in some situations, and appears in listed companies as a share price that is below the net assets per share.

This can occur when the business is currently operating with on-going losses, or assets are not being used at all, and investor's views of the business are that the assets will decline in value in the short or medium term.

The structural value cannot be sold directly, however this value is included in the sale price of the business if the business is sold on an operational basis.

Elements of structural value

The structural value is based on a number of issues.

This includes the collection of assets that have been assembled to create the business enterprise, and the dynamic processes that are currently operating.

This could include some of the following items

Static elements

Physical assets	Equipment, cash balances
Intangible assets	Patents, licences
Liabilities	Debt, other liabilities
Organisation structure	

Current arrangements	Customer supply contracts, supplier agreements
Dynamic elements	
Inflows	Average new customers per month.
Management Processes	Operation and management activities

Valuation

In the case of companies listed on a stock exchange, the net operational value would be equivalent to the "market capitalisation" of the company, which is the price of each share multiplied by the number of shares.

This is the value that the current share price implies for the total value of the business.

Takeovers of the company are based on this figure, although in most cases a higher value is offered in order to induce the majority of the shareholders to agree to sell their shares.

In the case of an unlisted company, a valuation of the business could be used to determine the net operational value.

A rule of thumb approach could also be used.

For example, a multiple could be applied to the current net profit, such as a multiple of ten times the net profit that may be used to estimate a value for a reasonably stable business.

The structural value could then be calculated by determining the difference between the net balance sheet assets and the total business value.

Analysis

Analysis of the returns of a business may use the net operating value as a capital value, rather than the balance sheet net asset value.

The net operating value is the effective capital value of the business, as this is the value that the business could be sold for.

This is similar to including intangible assets such as patents within the value of the business.

In cases where the operational value is based on a listed share price or an independent valuation, this value may be used to calculate a rate of return from the business.

However, in cases where the operational value itself was calculated from the net profit, this approach would not be relevant to calculating a rate of return, as in this case the rate of return is an input to the calculation.

Balance sheet structure

The structural value is dependant on the way in which the business assets are held.

For example, a business that leased most assets would have a higher structural value than a business that carried its assets on the balance sheet, although the effective value of the business structure may be the same.

For this reason, although structural values may be an important issue within business analysis and development, comparing structural value ratios of different companies may not identify the actual value of the business structures, due to different balance sheet structures being used.

Acquisitions

When a business is purchased, the structural value is recorded on the balance sheet of the purchasing company as an intangible asset, using the accounting term “goodwill”.

This term originally referred to the regular customers of an established business, which gave the business a value above the value of its physical assets.

Goodwill is included as an asset on the balance sheet, and is amortised over a period of time down to zero.

Under current Australian accounting standards, goodwill must be amortised over a period of not more than twenty years (** check).

However, accounting standards do not allow the structural value created within the business itself to be recorded within the financial statements.

Negative structural value

A negative structural value occurs when a business is operating at a loss, with net assets declining as time goes by.

This can also occur when assets that are locked within a corporate structure, but where no operations are currently being conducted.

Other cases include situations where the market view may be that the management of the company may manage the assets poorly, and produce a negative return.

This can occur, for example, when there is an excess of cash within the company, and there is a chance that the management may invest the cash poorly in a new project simply to move the business forward.

In these cases, ceasing operations would lead to an increase in value, as the negative structural value was eliminated.

In some cases, a business owner may withdraw from operations, and liquidate the assets of the business.

This occurs in declining industries, for example, where the sales of the entire industry decline over time as other industries become more popular.

Negative structural value also attracts takeovers from other companies, due to the price being low and being below the asset value.

This may involve an “asset stripping” exercise, when operations are closed and the assets are sold, or the assets could be integrated into existing operations.

2.13. Intangible property

Intangible property includes any items that the business owns that are not physical items.

This includes patents, licences, brand names, and designs.

Intangible property can have significant value.

In the media industry, for example, a large proportion of the assets are the value of television broadcasting licences and newspaper mastheads.

A newspaper masthead is simply the name and logo of a newspaper.

The publisher owns the rights to use the masthead, employs staff such as journalists and editors, buys stories from news services, and prints the newspaper itself.

The value of the newspaper masthead itself can be very high.

For example, if the same process was followed for a new newspaper that was not well known, sales may be low, even through the contents of the newspaper may be the same.

New newspaper titles and other media titles appear rarely, due to issues such as the large capital cost of high capacity printing presses, costs involved in producing the content, and distribution arrangements with distributors.

2.13.1. Types of intangible property

Intangible property falls into several categories.

These include the following.

2.13.1.1. Abstract items

Abstract items are designs and items that exist separately from their recorded form.

This includes music, film, and computer software.

Abstract items may be covered by patents, in the case of invented processes, or copyright, in the case of artistic and creative works.

These items would generally be included in the financial statements under headings such as patents, or copyrighted works.

Patents & copyright

Patents apply to ownership of an invention, such as a new manufacturing technique, or a medical drug.

Artistic and creative works are governed by copyright, while invented processes are governed by patents.

Copyright exists as soon as a work is created, while patents over inventions must be granted by the patents office before they take effect.

The result is similar in each case, with the owner of the item having the right to produce the item or licence other parties to produce it, without the design being copied without their consent.

Trade marks & brand names

Trade marks and brand names are graphical logos and descriptions that identify a product.

In the case of well-known brand names, these may have significant value.

Trade marks and brand names must be registered before legal action could be taken to prevent other manufacturers from copying the brand name or trade mark.

2.13.1.2. Licences to operate

Licences involve licences to perform certain activities, such as television broadcasting licences.

This differs from licences to use abstract property, such as a licence to use a patented process within a manufacturing process.

In the case of licenses to manufacture products and perform services using designs owned by other parties, licences of this type are not usually recorded in the balance sheet.

2.13.1.3. Goodwill

Goodwill is recorded as an intangible asset when a business is purchased for a price that is above its net asset value.

This is amortised over a period of time.

Amortisation is similar to depreciation of physical items.

An expense is recorded in each period to reflect the reduction in value, and the value of the asset in the balance sheet is reduced.

2.13.2. Valuations

Valuing intangible property can be difficult.

In many cases there is no similar property that can be compared to the item to determine a market value.

In some cases, an intangible asset cannot be sold, and so does not have a market value.

For example, the brand name of the business operation itself, rather than a separately maintained brand name, cannot be sold independently of the business.

The value of the property to the business is based on the income that could be generated from owning the property.

In cases such as patents and brand names, this may be difficult to estimate, and may vary widely depending on different circumstances.

Valuation of intangible property can be performed by valuation firms.

For example, a large market research agency may perform a valuation of a brand name, for the purpose of listing the brand name as an asset in the balance sheet.

Operational vs. Market Value

Physical assets are generally listed in the balance sheet at their book value, which is their cost price less depreciation.

Other assets are listed at their value to the business as an operating enterprise.

This may be quite different from their market value or liquidation value, particularly in the case of intangible assets.

A patent of a specialised production process, for example, may have significant value to the business, but may have little or no value if offered for sale.

In the case of liquidation, these assets should often be ignored for the purposes of estimating the funds that can be raised from asset sales.

For example, goodwill on acquisitions cannot be sold and has no value in a liquidation.

Goodwill also has questionable value to the future business operations, and in some cases a more reliable analysis would involve writing off the goodwill price in the current year as a cost of purchasing the other business.

Liquidation value may arise in managing a financial distress situation, or in assessing the financial position of a company from the perspective of an investor or lender.

Conservative valuations

The value of an intangible asset can vary widely depending on the opinion of the valuer, the use to which the asset is put, and trading conditions within the business.

Large write-downs of intangible asset valuations can occur when the asset is re-valued.

This can be a cause of major problems for the company, as the asset values fall significantly, and raising or rolling over debt may become difficult.

Also, a business may proceed with an overly ambitious expansion program, if the value that is placed on intangible assets is unrealistically high.

These problems may be reduced if intangible assets are valued conservatively, with balance sheet valuations using a base figure, rather than an optimistic figure.

2.13.3. Abstract items

Abstract items are items of property that have a separate existence from their physical form.

For example, a piece of music may be written as a page of notes or broadcast through a live performance.

In each case, the physical form is different.

However the music itself is the same composition in both cases.

This example illustrates that the music has a separate existence from the physical form, such as the sheet music or a sound recording.

This is also known as intellectual property.

The following items are abstract items:

- Music
- Films
- Books
- Computer software
- Medical drugs (chemical formula)
- Product designs
- Manufacturing processes
- Designs such as architectural drawings

In the case of a book, as another example, a book could be printed on paper or spoken as a recorded message, and the text would be the same in each case.

In the case of items such as product designs, these may not have a large value unless they can be patented.

Successful new features of products would generally be added to competitors products as time went by.

Abstract property does not include brand names, licences to operate activities, and other intangible property that does not involve a created design that is separate from its physical form.

Some items of abstract property are used of their own accord, such as artistic works, while other items are used as a basis for other activities, such as manufacturing processes and architectural drawings.

2.13.3.1. Sale vs. Licensing

As with other types of property, abstract property can be bought and sold.

The copyright to a creative work could be sold to another party, while a patent over a particular process could also be bought or sold.

However, abstract property has an additional feature that is unique in comparison to physical items.

A physical item can only be held by a single person at any given time.

Selling an item involves giving up the item in return for a payment.

The item is lost, and the payment is received.

However, while abstract property can also be sold or loaned, it can also be licensed.

This allows other parties to use the design or item, in return for a licence fee.

The purchase of a music disk, for example, involves the purchase of the physical disk, and also the purchase of a licence for the right to play the music.

Licences can be granted to multiple parties at the same time.

When a new licence is granted, the original item is not lost.

2.13.3.2. Production

Normal manufacturing and production issues are involved in the production of the physical media, such as a computer disk used to store a software program.

Other examples include the production of medical tablets.

In most cases the cost of the media itself and the production process is very low.

The majority of the cost applies to the licence fee, rather than raw materials or production costs.

The licence fee is then used to recover the costs of developing the design or item.

2.13.3.3. Continuous vs. Project-based production

Manufacturing and service businesses operate on a continuous basis.

Income is accumulated continuously, with the total value of the business's assets rising or falling with changing operating conditions.

Abstract property development involves individual transactions.

This is fundamentally a project-based exercise, rather than a continuous production exercise.

A project may be developed, sold, and then another project commences.

Large organisations may operate several projects at the same time.

In the case of smaller enterprises, a single project may be developed at a time.

Computer software is developed in this way, for example.

In contrast to continuous production, project development involves large differences in cash flows at different points in time.

The development phase may involve negative cash flow, with expenses being paid and no income being received.

The production or licensing phase may then involve positive cash flow, with income being received and expenses being low.

The development phase generally involves a period of time ranging from several months to several years in length.

The production phase may last as little as a few weeks, in the case of music and film, through to decades in the case of medical developments.

The following set of cash flows illustrates this difference between continuous activities and project-based activities.

Continuous		Project Based	
Expenses	**Income**	**Expenses**	**Income**
100	120	0	0
100	120	0	0
100	120	0	0
100	120	100	0
100	120	100	0
100	120	100	0
100	120	100	0
100	120	100	0
100	120	100	0
100	120	100	0
100	120	0	100
100	120	0	200
100	120	0	300
100	120	0	300
100	120	0	200
100	120	0	200
100	120	0	100
100	120	0	50
100	120	0	50
100	120	0	50
100	120	0	0
100	120	0	0
100	120	0	0

2.13.3.4. Profitability

Developing and licensing abstract property involves several issues.

Significant capital may be required to fund the initial expenses.

Also, the profitability of the total process may be based on a total set of events that have occurred over many years.

In contrast, the profitability of a manufacturing or service business can be determined on a month-to-month basis, ignoring past and future events.

2.13.3.5. Leverage

Abstract production is a highly leveraged exercise.

A poorly performing product may result in a large loss, while a successful product may generate a large inflow of funds.

Film studios, for example, have highly unstable income and profit, due to the fact that individual films may be highly successful or generate large losses.

2.13.3.6. Valuations

Valuing a continuous process can be done using multiples of the current income, the assets of the enterprise, and comparisons with other sales.

Valuing a project based activity is more complex.

This involves reviewing the full set of cash flows, from the commencement of the project, to the final income that is received before the value of the item falls to zero.

In situations where the entire life cycle occurs within a period of a few years, cash flows can be added and subtracted.

For example, valuing a film production may involve calculating the total expenses, and adding an estimate of the average income that the project may produce.

When the future sales may extend over a period of more than two or three years, a full net-present-value calculation would be required to determine the effective value of the business or the project.

This approach is used in valuing life insurance companies, for example, where policies may involve cash flows long into the future.

This process involves calculating a present value of a future cash flow.

For example, an income amount of $100 to be received from a project in three year's time may only be worth an equivalent of $82 at the current date.

This occurs because the $82 could be invested over the three year period, and may grow with interest to be equivalent to the $100 amount in three year's time.

The present values of each income and expense payment may be calculated, and added together to determine a total value for a project.

The calculations that may be involved in this process are described in the section on finance, beginning on page 734.

The following example lists a set of estimated cash flows from a project, the present value of each cash flow, and the total estimated project value.

Year	Cash Flow	Present Value
1	-100	-100
2	-100	-89
3	-100	-80
4	80	57
5	80	51
6	80	45
7	80	41
8	80	36
9	80	32
10	80	29
11	80	26
12	80	23
13	80	21
14	80	18
15	80	16
16	80	15
Total Project Value		141

The project value is the sum of the present value of each of the individual cash flows, including expenses and income.

In this example, the present value of the cash flows sums to a net value of $141 at the current date.

Future income amounts are often not known, and an estimate must be made of average likely income.

A present value is calculated using a discount rate.

A discount rate is similar to the interest rate that could be received from investing early cash flows in the project.

A discount rate may be determined from current interest rates, and adding an additional amount to the discount rate, known as a risk premium.

The risk premium reduces the present value of a cash flow to reflect the risk or volatility involved in the cash flow.

In cases where the cash flows could be estimated with reasonable accuracy, such as a property investment, toll roads, or a development for a client, a low risk premium may be added to current interest rates.

In cases of highly uncertain income, such as film and music production, a higher risk premium may be added.

Risk premiums would commonly vary from 2% to 15%, so that the total discount rate may vary from 10% to 23% if base interest rates were currently around 8%.

The net present value is the value of the project, and this is the amount that would be paid by another party to take over the expenses and income of the project.

The same approach can be used to value a business itself, in addition to valuing individual projects.

2.13.3.7. Disconnection between price & cost

In the case of continuous production, such as manufacturing and services, each item produced has a cost and a sale price.

For example, producing an item may involve cost of $10.

With a sale price of $12, this would result in a net profit of $2 per item.

In the case of licensing, however, this relationship between costs and sale prices breaks down.

In a licensing development, the costs are a single fixed dollar amount, and are not related to the number of items produced.

Also, in the pure sense of licensing, the income from each item flows directly into the business.

In theory, any sale price at all would result in a profit from the individual transaction.

In practice, some manufacturing and distribution costs are involved.

An overall profit would be recorded if the number of sales was high enough to recover the development costs.

This situation can be summarised in the following formulas:

Production (profit per period)

$$\text{profit} = (\text{price per unit} - \text{cost per unit}) \times \text{number of units} - \text{fixed cost per period}$$

Licensing (profit since project commencement)

$$\text{profit} = \text{sale price per unit} \times \text{number of units} - \text{total development cost}$$

This disconnection between costs and sale prices has a number of implications.

Setting prices

In the case of production, the sale price is set within a narrow range by the cost of production.

If the sale price is below the cost of production, sales will generate a loss rather than a profit, and the business must either cease production, alter the current situation, or net assets will eventually decline to zero and the business will close.

If the sale price is significantly above the cost of production, strong cash inflows per item will be recorded.

However, in this situation, the number of sales may be low, or competitors may be attracted to the market and offer lower prices.

In the case of licensing, there is no reference point in determining the sale price.

By definition, licensed items are generally different from the items available from competitors.

In practice a broad price range is usually determined by market interest in the product.

However, alternative products that have similar features may vary widely in price.

Multiple versions

This situation also allows for the same underlying product to be sold in different ways.

For example, a computer chip could be designed and manufactured for use within hand-held calculators.

Two versions of the calculator could be produced using the same chip, one with basic features at a low price, and another with advanced features at a higher price.

At first thought, it may seem strange to sell the calculator hardware at a low price, when the same item could also be sold at a higher price.

However, there is an underlying market demand for low-cost basic calculators, and also a market demand for higher priced calculators with advanced features.

Assuming that the major cost involved was the design process for the chip itself, rather than production, the cost of producing individual items may be low.

This arrangement may have lower costs than organising two separate design projects.

By offering two versions of the product, the total number of sales of the chip may be increased.

A similar arrangement is sometimes used with different versions of computer programs.

This marketing approach was tried in the personal computer software market during the early 1990's, although it was not particularly successful, with sales of the reduced versions being low.

3. Developing a business

3.1. Developing a business

Developing a business requires three fundamental steps

1. Creating a product or service that is attractive to customers.

2. Delivering the product at a price that is competitive with other products, and is low enough that customers would choose to purchase the product.

3. Overcoming barriers caused by closed markets, existing long-term agreements, and difficulty with marketing and communicating with potential customers

The first stage involves the concept and ideas behind the business venture.

This would lead to the design and development of actual products or services.

In a start-up enterprise, an initial stage of discussion with potential customers, development of ideas and producing sample products or designs may be involved in the early stages of the enterprise.

The second stage involves the effective operation of the business.

Initially this may involve hiring employees, sourcing raw materials from suppliers, purchasing equipment and creating processes and operational plans.

Ongoing management may involve reviewing and managing costs, updating equipment and processes, and managing the cash flow and capital operations of the business.

Products have a limited life cycle and the design and development of new products may be required from time to time to continue the long term operation of the business.

The third stage involves generating sales of products.

Although a product may be produced and offered at an attractive price, sales may not occur for many reasons.

In many wholesale markets, existing long-term arrangements between customers and suppliers may be a significant barrier to the generation of sales by a new business.

This is a long-term issue and is not overcome by a single approach.

However, various steps can be taken.

Free samples and demonstrations can be given to familiarise potential customers with the product.

In many cases, the issues that are behind a customer's purchasing decisions may be quite different from the issues that would be initially imagined.

For example, price and quality are usually major issues.

However, the reliability of supply is also of critical importance.

Especially in the case of new businesses, establishing the case that a product can be supplied in the required volumes on a reliable basis may be highly important.

In the retail market involving sales to the general public, promotion may be based on advertising, arrangements with distributors to carry the product, and an initial period of low-cost services to establish a presence within the market.

Development of the business over the long term may involve growth and change in the nature of the business.

In some cases a business is established with a clear and direct operation, fills a specific function within a market, and operates for a long period of time with little change.

A wholesale distributor of fruit and vegetables from growers to retailers may be an example of this situation.

In other cases, a business may continually evolve over time.

It may change from a manufacturing business to a service business, or from a service business to a manufacturing business.

New areas of the business may develop, while others may close.

The business may grow in size, or it may decline.

A business that commenced in one industry may eventually move to a separate industry, either in a single jump or gradually over time.

The economy changes continuously, with some industries declining and new growth industries appearing.

3.2. Avoiding disaster

Businesses can collapse surprisingly rapidly.

In some cases, a business that appeared to be operating smoothly can strike several difficulties and its financial position can deteriorate within a matter of months, leading to liquidation or a break-up of the business.

Some steps can be taken to reduce the changes of serious problems occurring when they are least expected.

Cash flow

Cash flow problems can occur when sales are slow, or when several large inflows are delayed for one reason or another.

Cash flow problems can also occur during periods of high sales.

In these cases, a large number of raw materials may need to be purchased, or additional work performed to meet a high level of customer orders, although the income from the sales may not come through for an extended period of time.

Cash flow problems can be reduced by ensuring that an adequate level of working capital is available.

This includes cash balances held in bank accounts, and unused available credit through overdrafts and other credit facilities.

Debt & negative cash flow

High debt levels may place a business in a vulnerable position.

When interest costs are a large part of net income, a small decrease in revenue or a small increase in expenses may change the net cash flow from a positive to a negative value.

Negative cash flow occurs when the cash that is flowing out of the business in expenses occurs at a greater rate than the cash that is flowing into the business from income.

Negative cash flow is an unsustainable situation, as the net assets will eventually fall to zero, leading to the closure of the business.

High debt levels may be used for a period of time in cases where revenue and expenses are very stable, however as a general rule a business is placed in a more secure position by reducing the level of debt.

The level of appropriate debt varies considerably with the industry and type of operation.

However, a level of 50% debt and 50% equity is a common benchmark.

For example, a business may have total assets of $100, debts of $50, with the net assets being $50.

Debt levels above 50% of assets may represent a risk to the business if operating conditions deteriorate.

Debt levels can also be reviewed by calculating the percentage of net cash flow that is used to meet interest payments.

When interest costs exceed around 20% of net cash flow, this may signal that the interest burden represents a possible danger to the survival of the business.

Debt levels can be reduced by raising additional equity funds from investors, directing cash flow to repaying debt rather that paying dividends, and selling unused assets to repay debt.

Reducing debt levels generally needs to be done as soon as the problem becomes apparent.

If operation continues and problems later occur, it is generally too late at that time to implement the debt-reduction processes.

High growth rates

High growth rates may present a danger to business survival.

Although this is generally a positive development, when a high growth rate occurs it must be carefully managed.

A company can exhaust its capital resources very quickly during a high growth phase, as new equipment is purchased, raw material supplies are increased and payments to employees and contractors rise dramatically to meet customer orders.

In these cases the business may become insolvent and be liquidated due to having insufficient capital to meet expenses and continue operation.

Assets

Assets that comprise a significant proportion of the business assets, or that are essential to business operation, can be insured in many cases.

This includes buildings and equipment.

Asset should generally be valued at conservative levels.

This particularly applies to intangible assets such as brand names.

Valuing assets at reasonable levels may be important in maintaining the credit rating of the company, if any, and the ability of the company to raise funds through debt or equity.

A corporate review that results in a severe downward valuation in a large asset can shatter the balance of the financial structure of the organisation, and in some cases may lead to collapse of a business.

3.3. Plans vs. Directions

Long term plans can do more harm than good.

Long term plans may lock the business into a fixed way of thinking that prevents it from adjusted to changes in circumstances as time passes.

Plans rely on making assumptions about events that will occur in the future.

In these events do not occur, the business may suffer considerable loss.

Also, actions that are taken early in a planning period may mean that the actions in the later part of the planning period have to be followed through, even if changed conditions would make this unfavourable for the business.

Plans involve intentions to take specific actions on specific future dates.

Plans also involve assumptions about actions that will be taken by other individuals in the future, that the business has no control over.

For example, budgets and targets often include references to a fixed number of sales in a future period.

However, the decision to purchase an item is made by the customer, not the business.

A business could plan to purchase an item of equipment, for example, but it cannot plan to sell a specified number of items if customers simply decline to purchase the business's products.

This illustrates a general issue that plans can only be made for actions that the business performs, a plan cannot be made about actions that independent parties will perform.

An alternative approach to making long term plans is to set future directions.

However, some business also operate without and plans or a consistent direction.

Transactions may occur at random, with transactions being conducted as the opportunity arises, and without any consistent approach or practical direction for the businesses.

Businesses operated on this basis rarely grow over the long term, and many business failures are characterised by an approach that involved random transactions rather than a clear future direction.

Setting future directions involves performing the current actions of the business in a consistent way, so that the business may develop in a particular direction.

This involves a flexible approach that can adapt to changing conditions.

However, a direction-based approach still involves considering the possible ways that events may unfold, and considering future actions that may be available as this happens.

A direction based approach does not involve planning specific actions on specific future dates, and it does not involve making assumptions about future actions by other parties.

This following example compares a plan-based approach and a direction-based approach to considering the future development of a business.

Plan

- Sell 100 items next year.
- Sell 200 items in the second year.
- Reach break-even cash flow in the third year.
- Develop product X in the third year.
- Sell 100 units of product X in the fourth year.
- Open branch office in the fourth year.
- Open a second branch office in the fifth year.

Direction

- Focus current efforts on increasing sales.
- Reach cash flow break-even in the medium term, possibly the third year.
- Develop product X after cash flow break-even is reached.
- Open branch office after developing product X, possibly in the fourth year.
- If the first branch office is successful, open a second branch office in the following year.

A direction-based approach is not less rigorous or detailed than a plan-based approach.

This may involve the same or more thought and consideration than an approach based on setting specific plans.

A direction based approach avoids making assumptions about future events.

This is due to the fact that many possible events could occur, while plans generally assume that a single course of events will unfold.

Also, the direction-based approach allows for variable time frames, and considers taking future actions after an earlier condition has been reached, rather than at a certain fixed date.

The direction-based approach also allows for the possibility that some evens may or may not occur, such as a product being successful or unsuccessful, in contrast to a plan-based approach that generally assumes that a fixed set of events will occur on future dates.

In the case of projects, however, the opposite situation occurs.

A project must generally be planned carefully, with a fixed set of tasks, timeframes and events, in order to be completed successfully.

Project management involves co-ordinating the activities of the project according to the schedule, and making changes to the project activities as events unfold to ensure that the project is followed through to completion.

Projects that operate on the basis of developing general directions, rather than completing a specific development by a future date, can become a permanent drain on the cash flow of the business and may never produce any substantial completed results.

3.4. Records and information

Accurate and up-to-date information is essential to managing a business operation.

This applies to all commercial activity, from selling handmade crafts at a craft market, to global multinational enterprises.

Many business failures are associated with poor record keeping and access to information, including large corporate collapses.

In some cases, particularly corporate enterprises and manufacturing, large volumes of complex reports and information may be produced.

However, only a few key items may be necessary to check the major issues involved in an operation.

This may include the trend in sales, the trend in expenses, and the availability of cash balances to meet major short-term cash flow problems.

Small Enterprises

The essential financial records for a small or medium sized enterprise can be summed up in the following list:

- Cash balances in bank accounts.
- Income for the period.
- Expenses for the period.
- Amounts currently due for payment, or due within a short period.

Income and expenses may be recorded on a weekly or monthly basis, and a trend over the previous months may also be recorded.

A daily cash book is generally kept by businesses that operate with physical cash.

Accounting records may be reconciled against bank statements on a monthly basis.

Other records that may be needed include lists of stock on hand, which can be checked through manual stock counts on a periodic basis.

Larger enterprises

Financial records for larger enterprises are generally compiled on a monthly basis.

This may include a range of information, such as some of the following items

- Income, allocated by category such as product type.
- Expenses, allocated by category.
- Capital items such as asset purchases and sales.

Actual figures may be reported, along with figures for budgeted targets, year-to-date totals, and comparisons with the same period last year.

Non-financial records apply to many businesses and may include some of the following information:

- The number of items sold for each type of product.
- The number of customers opening accounts for services.
- The number of customers closing accounts.
- The total number of current customers with service agreements.
- Volume figures, such as numbers of products produced, raw materials used, or hours of services billed.

Inventory and stock lists would record the number of items on hand for each type of item that was held.

In most cases these records are computerised, and producing reports is not difficult if the initial information is entered as it occurs.

Some small enterprises operate with manual paper records in situations were the number of transactions is not large.

Manufacturing production involves a much larger volume of information, such as schedules of production runs, numbers of items produced, work in progress, stock on hand, hours of production and so on..

Financial Statements

A full set of financial statements includes a balance sheet, profit & loss statement, and possibly a cash flow statement.

Large organisations generally produce a full set of financial statements on a quarterly or half-yearly basis.

In smaller enterprises, a complete set of financial statements may or may not be produced.

In many cases, a cash-based accounting system is used based on income and expenses, with capital transactions such as debt raising and asset purchases occurring as required.

Financial statements can be useful in managing and developing a business, however a complete set of audited accounts is generally only necessary for formal reporting to external investors, and for lodgement to stock exchanges or government regulators as required.

3.5. Analysis

The analysis of business results and conditions can be broken down into two separate areas.

The operating conditions of the business related to the income, expenses and operations of the business.

The financial structure relates to the way that the business is financed.

A property investment is an example of this separation.

An investment property may generate income, it may have maintenance expenses, and it may have a value that rises or falls with changes in property values.

An investor who purchased the property may do so in many different ways.

They may buy the property with cash, they may borrow and use debt to purchase the property, or they may use a mixture of both.

The property issues are independent of the financing approach that was used to purchase the property.

In some respects, the business itself is an operating enterprise, while the financing structure is a framework and a shell that holds the business in place.

Reviewing the financial statements is the basis of reviewing both the operations and the financing structure of the business.

Although the management of a business involves more detailed knowledge and control of the operations of the business that the figures that appear in the

financial statements, these figures may still highlight major issues and structural problems with the business

3.5.1. Accounts & financial statements

Analysis of the business operations and structure involves the financial statements of the business.

In the case of a large organisation, financial statements are prepared on a regular basis.

In the case of smaller enterprises, financial statements can be prepared from the raw figures for the business operation, such as the total income received during the period, interest payments and so on.

3.5.1.1. Per-share figures

In the case of companies listed on stock exchanges, some figures may be quoted as an amount per share, rather than a total dollar figure.

For example, a dividend payment is usually quoted as a number of cents per share, although the total amount is listed in the financial statements.

Total dollar figures and per-share figures can be converted back and forth by multiplying or dividing by the number of shares.

In the case of a listed company, this figure is generally included with the financial statements, or alternatively it can be calculated using information such as the dividend-per-share, and the total dividend amount from the cash flow statement.

The following formulas list some calculations that can be used to determine earnings yields and dividend yields.

The earnings yield is the return on the investment at the current share price.

The dividend yield reflects the return that the dividend payment would represent, compared to the current share price.

The dividend yield is generally less than or equal to the earnings yield, as the dividend represents a part of the earnings.

When the full earnings are paid as dividends, the dividend yield and earnings yield would be the same.

The part of the earnings that was not paid out as dividends may be reflected in an increase in the share price, all else being equal.

Per-share figures

$$\text{number of shares} = \frac{\text{total dividend payments}}{\text{total dividends per share}}$$

$$\text{amount per share} = \frac{\text{total amount}}{\text{number of shares}}$$

$$\text{total amount} = \text{amount per share} \times \text{number of shares}$$

$$\text{operational value} = \text{share price} \times \text{number of shares}$$

Earnings yield

$$\text{earnings yield} = \frac{\text{net profit}}{\text{operational value}}$$

$$\text{earnings yield} = \frac{\text{earnings per share}}{\text{share price}}$$

$$\text{earnings yield} = \frac{1}{\text{price earnings ratio}}$$

$$\text{price earnings ratio} = \frac{1}{\text{earnings yield}}$$

Dividend yield

$$\text{dividend yield} = \frac{\text{dividend per share}}{\text{share price}}$$

The operational value is generally termed the “market capitalisation” in the case of a listed company.

3.5.1.2. Business Value

Some financial analysis involves calculations based on the value of the business.

In the case of a company listed on a stock exchange, this can be determined from the "market capitalisation" of the company.

This figure is equal to the current share price, multiplied by the number of shares.

In the case of businesses that are not listed, a business value can be determined by an independent business valuation.

For the purposes of review, an approximate value could be determined from comparisons with sales and offers for similar businesses.

Businesses are offered for sale in various publications.

A rule of thumb valuation could also be determined by applying a multiple to a figure such as a multiple of the current net profit.

A business with a reasonably stable income may trade for a value of around ten times net profit, for example.

However, when this approach is used, ratios cannot be determined from the business value, as the business value itself has been calculated by applying a fixed multiple.

3.5.1.3. Small Enterprises

Analysis of small enterprises may require some changes to the figures to create a set of accounts that reflects the operation as a pure business enterprise, separate from the personal holdings of the business owners.

These figures may not represent actual cash payments or cash holdings, however they would be used to create a set of accounts that could be analysed using the standard approaches.

This could include the following steps:

- Allocating salaries for the business owners.
- Removing personal expenses from the expense total.
- Separating property used for business purposes from property used for personal purposes.
- Allocating rent or lease payments from the business owners to the business where assets where used for personal purposes.

As the business owners own the same property whether it is part of the business or whether it is held personally, this makes no difference to the business owner's total assets, however it enables an analysis to be performed.

For example, some retail stores include a personal residence attached to the store itself.

In preparing business accounts, the whole property would be considered to be owned by the business, with the business owners receiving salaries, and paying rent to the business for the private residence that was part of the property.

The rent amount could be determined from the rent charged for leasing similar buildings to private tenants.

Alternatively, the whole property could be considered to be owned personally, with the business paying rent to the business owners for occupancy of the retail section of the property.

The profits of the business also flow to the business owners, so there is no practical difference involved in whether this is done by salaries, or by dividends and profit distributions.

These approaches may enable the finances of the business to be reviewed using the standard calculations and approaches.

For example, these steps would have to be taken before a value could be estimated for the business using a multiple, such as a multiple of the current profit.

3.5.2. Production analysis

3.5.2.1. Production review

Production review and analysis involves reviewing the number of items produced, the mix of different products processed, and related information.

This involves reviewing physical items produced and services billed, in contrast to the financial analysis which reviews cash flows and profitability.

Production analysis is heavily used in manufacturing, however it could also be applied to some service businesses.

Production may typically be reviewed and managed based on monthly figures.

Information that could be included in production reports includes items such as the following:

- The number of items produced for each type of product.
- The amount of raw materials used, and the volume of supplies such as electricity and fuel that were used.
- The number of hours of services billed to clients.
- The number of new customer accounts, or the number of sales.
- The number of customers closing accounts.
- The percentage of time that facilities were available for production.
- The percentage of plant capacity that was used in production.
- Margins for the period, including production margins of product sales to product costs, and total margins including allocation of fixed costs across production.

Figures can include the value for the latest period, targets and budgets, figures for previous periods, comparisons with the same period last year, trends and percentage changes.

Comparisons with previous periods, such as the same period last year, or a series of monthly results, can be a useful benchmark and may highlight rising or falling trends.

However, specific targets and budgets may not always be beneficial.

Specific figures may set a framework which alters the way that things are done with the purpose of reaching a target, rather than the purpose of developing the business based on future possibilities.

In some cases this can limit the possibilities for change and growth in the operations of the business.

3.5.2.2. Availability

Availability can be a significant issue in some production processes.

This refers to the percentage of time that the facilities were available for use.

This includes time where the facilities were not unavailable due to scheduled maintenance, production problems stopping production, and lack of supplies.

Low availability can be due to issues such as equipment that is faulty or worn out, poor scheduling, lack of maintenance, insufficient inventory, or poor management of inventory levels.

Also, in some processes, the act of stopping and starting a production process can be highly expensive, even when the length of time itself may be quite short.

3.5.2.3. Capacity utilisation

Capacity utilisation refers to the volume of items produced, compared to the total volume that the facility can produce.

Fixed costs such as the depreciation of equipment, marketing costs, administration and so forth are spread across the number of units that are produced.

The capacity utilisation figure may have a large impact of profitability, due to the fact that a low volume of production results in a higher fixed cost being borne by each item that is produced.

Issues affecting capacity utilisation include customer demand for the products, availability of facilities, scheduling production, and the proportion of time that the facility is actually used.

3.5.2.4. Fixed vs. variable costs

Fixed costs are costs that are the same for each period of time, regardless of the number of items produced.

Building rents and depreciation are examples of fixed costs.

Variable costs relate to raw materials, fuel, and other costs that are direct inputs to the production of an individual item.

Salary costs can vary between being fixed costs to the business and variable costs of production, depending on issues such as permanent, temporary and contract employees, overtime, administration versus production personnel and so forth.

A similar issue may arise in some service businesses.

For example, a firm of accountants may have fixed costs for general administration, and variable costs for salaries paid to employees who perform billable services for clients.

In the case of a business with a high proportion of fixed costs, the volume of production may have a larger impact on net profit than a similar business in which a high proportion of the costs are variable costs.

A high proportion of variable costs may reduce the risk to the business of losses occurring during periods of slow sales, while a high proportion of fixed costs may result in strong cash flow when production and sales volumes are high.

3.5.2.5. Cost structures

In some businesses the costs may be divided into a few major items, while in other processes a large number of raw materials and inputs may be used.

A cost structure review can be done to list all the individual costs that are involved in producing a single item of a particular product.

This could be used to consider alternative raw materials, highlight major costs that could be addressed, and also highlight individual items that could be changed or altered by changing the manufacturing processes.

3.5.2.6. Product mix

Each product may involve a different set of raw materials, a different balance of fixed and variable costs, and different profit margins.

Although customer demand is the main issue determining production, in some cases the mix of products could be altered to improve the overall efficiency of the plant production.

For example, a large batch of a particular product could be made and sold at a discount price, with the high volume offsetting the reduced margin on the individual sales.

3.5.3. Operating conditions

Operating conditions can be reviewed based in figures from the profit-and-loss statement.

The cash flow statement may also highlight relevant issues.

3.5.3.1. Financial statements

For the purposes of this issue, a basic profit-and-loss statement may have the following form

Revenue	105
Operating Expenses	65
EBITDA – earnings before interest, tax, depreciation and amortisation	40
Depreciation	15
Total Expenses	80
EBIT - Earnings before interest and tax	25
Interest	2
Tax	7
Net Profit	16

In this statement, the figures are calculated in the following way

Revenue	Income received from sales
Operating expenses	Expenses paid during the period
EBITDA	Revenue minus operating expenses
Depreciation	The depreciation accounting entry
Total Expenses	EBITDA minus depreciation
EBIT	Revenue minus total expenses
Interest	Interest paid

Tax	Tax paid
Net Profit	EBIT minus interest minus tax

The figures have the following meaning

Revenue	The payments that the business received from customers.
Operating expenses	The payments made for raw materials, rent, payments to employees etc.
EBITDA	This is the gross cash flow of the business, before paying interest and tax.
Depreciation	The decline in the value of the assets due to the decline in the value of equipment and other physical assets.
EBIT	The earnings of the business from gross cash flow, minus the value lost from depreciation.
Interest	Interest payments on debt.
Tax	Tax payments.
Net profit	The increase or decrease in the value of the assets due to operations.

The balance sheet for this example is listed below

Assets		
	Property, plant & equipment	380
	Cash	20
	Total Assets	400
Liabilties		
	Debt	150
Net Assets		250
Structural Value		75
Operational Value		325

The last two items, “structural value” and “operational value” are not part of the standard financial statements.

The “operational value” is the value of the business, and can be determined from the market capitalisation of a listed company, or an estimate of the sale price for other businesses.

The term “business value” may also be used for the operational value of the business.

The “structural value” is the difference between the operational value and the net assets from the balance sheet.

This amount reflects the additional value of the business, compared to the physical assets, as an operating enterprise.

In reviewing the results, ratios or percentages are often used, rather than dollar amounts.

The ratios that would be expected for a business vary greatly depending on the industry and the development stage for the business.

Comparisons may be done against the ratios of similar businesses in the same industry, and against the average figures from the industry.

These figures are available in publications issued by stock exchanges and government departments.

Appendix D contains some broad ranges for a basic range of business operations.

However, these figures may vary greatly over time and in specific circumstances.

3.5.3.2. Gross profit margin

The gross profit margin can be calculated using the following formula

$$\text{gross profit margin} = \frac{\text{EBITDA}}{\text{revenue}}$$

$$= \frac{35}{105}$$

$$= 0.33$$

$$= 33\ \%$$

In this case, the gross profit margin is 33%.

This indicates that 33% of the income was passed on to the next stage in the accounts.

This figure varies widely between different industries.

In some cases, the gross profit margin may be as low as a few percent.

This occurs in situations that involve trading or distributing large volumes of goods, where cash inflows and outflows are high with a small difference between input and output prices

In general business operations, figures of 20% or 30% would be more common. (** check)

This stage is the first issue involved in assessing operating performance.

If the gross margin is very low, then all other figures become irrelevant.

The gross profit is the amount that is passed on to the next stage of the accounts, which is then allocated to depreciation, interest, tax, and net profit.

If the gross profit is small, a healthy net profit figure is not possible.

In these cases, the gross profit can be increased through raising revenue, reducing expenses, or both.

This may prompt a more detailed review of the entire business direction.

However, revenue problems may suggest that new product development is required, prices could be increased, marketing efforts could be improved, or that some markets should be abandoned and other areas of business explored.

Expense problems could be due to excessive staff numbers, a poorly organised or unproductive operating environment, lack of attention to general costs such as property rents, or outdated equipment.

3.5.3.3. EBIT margin

The EBIT margin can be calculated using the following formula

$$\text{EBIT margin} = \frac{\text{EBIT}}{\text{revenue}}$$

$$= \frac{25}{105}$$

$$= 24\ \%$$

This indicates that, allowing for all costs, the business retained 24% of revenue.

The range of typical figures for this ratio varies widely from industry to industry.

A figure that was significantly below the industry average may suggest that serious changes were needed within the business operation.

A high figure would generally suggest a business that was operating efficiently.

High margins can also occur as a result of technology or other propriety assets that allow the business to deliver the products or services at lower costs than competitors.

Alternatively, the business may have a product or service that is unique and meets a high demand from customers.

3.5.3.4. Return on assets

The return on assets figure can be calculated using the following formula:

$$\text{return on assets} = \frac{\text{EBIT}}{\text{assets}}$$

$$= \frac{25}{400}$$

$$= 6.3\%$$

The return on assets figure represents the return that the business has generated from the assets that are being used within the business.

The assets used by a business may vary widely from one business to another.

Cash flow based service businesses, and other businesses that lease most of their buildings and equipment, may have very few assets.

In these cases, the return on assets figure may be a very high number, and may not be a relevant figure.

The return on assets figure may be relevant in the case of capital-intensive businesses such as manufacturing.

The return on assets figure may also become relevant when it is low.

This indicates that assets are contained within the business that are being poorly utilised.

For example, in this situation the return on assets figure is 6.3 %.

In theory, if interest rates were around 7% for example, a higher return could be achieved by ceasing business operations, selling the assets, and placing the funds in a bank deposit.

Low return-on-assets figures are common within manufacturing and capital intensive industries.

Manufacturing is a highly competitive business, and is a declining section of the economy.

However, many efficient and well managed manufacturing operations exist and there is wide scope for successful operation in these field.

A low return on assets figure may be due to a range of causes. These include:

1. Low capacity utilisation, with low production due to lack of customer demand, excessive down-time, or poor scheduling.

2. Overcapacity, where a production facility has been built that has higher capacity than the underlying demand for the product.

   This is a common situation in large property developments. A project may be carefully planned and designed, and then the design is extended as the project progresses, with additional stages and extensions to the design being added.

   The finished project may be much larger than the original design.

   This may result in large sections being unused, and the project developers finally selling the project at a large loss, with the final value being close to the value of the initial project design.

3. Outdated and inefficient equipment or facilities.

4. Unused assets. Assets are sometimes transferred through trusts and inheritance, where the original business operator has lost interest in the business or has died, and the assets remain in existence but are not utilised.

This can also occur when sections of a business operation are closed but the assets remain in the business, such as vacant office space.

3.5.3.5. Trends in margins

The following figures could be reviewed to highlight positive trends and areas that may suggest developing problems.

- Trend changes in sales revenue.
- Trend changes in expenses.
- Trend changes in gross profit margin.
- Trend changes in EBITDA margin.
- Trend changes in EBIT margin.

An upward trend in revenue would generally be an encouraging situation.

However, if expenses rose at a faster rate than sales, margins would shrink and profitability would decrease.

This situation can occur when a business is expanding and sales are rising, however expenses rise at a faster rate than sales.

This leads to net profit declining, even though sales are rising.

This is a common situation in high growth industries with new companies rapidly expanding.

Conversely, sales may be flat in a declining industry, however expenses may fall steadily due to improved technology and more efficient operations, and profitability may actually increase.

Individual situations vary widely, particularly when personal assets and expenses are combined with a business operation, and these figures need to be interpreted in the light of each particular situation.

3.5.3.6. Depreciation

The depreciation figure must be interpreted in light of the structure of the asset base, and ratios using the depreciation figure are not usually calculated.

In a service business or a business that leases most of its equipment, the deprecation figure may be very low and may not be relevant.

In cases where there is a significant amount of equipment that is owned, however, the depreciation figure may be significant.

A high depreciation figure would generally suggest a large quantity of new equipment, which would generally be a positive situation.

However, due to the heavy depreciation costs, the equipment would have to be fully utilised to offset the costs and produce a net profit.

The return-on-assets figure could be relevant in this case.

A low depreciation figure in a manufacturing business that owns its equipment may indicate that the equipment is old and out-of-date.

This may boost the accounting profit, as the depreciation figure would be low.

However, this is also likely to lead to less efficient production, and may result in higher production costs.

3.5.3.7. Capital Expenditure

Capital expenditure is the funds that were spent on purchasing new equipment during the period.

In a small enterprise, this item may vary greatly from one period to another, as major purchases of equipment only occur occasionally.

In a large business enterprise with a wide range of separate operations, the total capital expenditure may not change significantly due to individual transactions.

Comparing the capital expenditure figure with the depreciation figure can be used to identify the approach to future changes that is currently being used by the business.

One approach to this issue could be to calculate a “capital expansion ratio”.

A figure of one would indicate that the current base of physical assets was being maintained at a steady level, a figure above one would indicate an expansion in the base of physical assets, while a figure below one would indicate a declining base of equipment and facilities.

The could be calculated using the following formula

$$\text{capital expansion ratio} = \frac{\text{capital expenditure}}{\text{depreciation}}$$

If the capital expenditure is significantly lower than the depreciation figure for a number of years, this indicate that the business may be operating with a declining outlook.

This situation may involve the capital stock being run down.

Sales, cash flow and profits could all be strong, however this may have represented an unsustainable long-term situation, as the property, plant and equipment was being run down but was not being replaced.

This may be deliberate in some cases, due to an excess of capital stock or an indention to exit the business operations at a future time.

However, in general this may indicate that adequate investment in new equipment was not being made.

A business operating under these conditions may have several strong years and the suddenly develop serious problems.

Capital expenditure that is similar in size to depreciation over a number of years indicates a stable ongoing operation.

A capital expenditure figure that is significantly above the depreciation figure for a number of years indicates an expansion phase.

Businesses often have a major capital expenditure program for a period of time, before returning to stable operations.

For example, a cinema operator may implement a major program of refurbishing cinemas and building new facilities over an eighteen month period, before returning to stable operations for the following years.

In cases where a major capital expenditure program is implemented, this may be a positive sign for the future of the business.

However, the individual entries within the accounts need to be interpreted carefully during this time, as large variations in figures can occur as major changes in the capital structure of the business are made.

3.5.4. Financial structure

3.5.4.1. Structure

The EBIT margin examines how efficiently a business manages costs, while the return on assets measured how efficiently the business utilised its assets.

However, these assets must be funded, and the financial structure analysis examines the way in which the assets are funded.

Funding through debt and equity can be considered a separate issue from the assets and operation of the business.

The return on assets figure specifies the return from the business operations, based on the assets that are used in the business activity.

This approach is particularly relevant to capital-intensive businesses such as manufacturing, and is less relevant to cash flow based activities such as service businesses.

3.5.4.1.1. Gearing

The assets of a business can be funded using a combination of debt and equity.

Debt involves borrowed funds and bears in ongoing interest cost

Equity is the excess funds within the business and is the net value of the business assets.

The gearing ratio is a measure of the proportion of debt and equity that are used to fund the assets.

The ratio of debt to equity is sometimes used, however an alternative measure is the ratio of debt to total assets.

This gives the percentage of the assets that have been funded with debt.

This gearing ratio can be calculated using the following formula

$$\text{gearing} = \frac{\text{debt}}{\text{assets}}$$

$$= \frac{150}{400}$$

$$= 38\ \%$$

This indicates that 38% of the assets have been funded with debt, and the remaining 62% with equity.

Gearing magnifies the returns of the business, for both a positive return and a negative return.

Debt also carries a fixed regular interest cost, and this can cause cash flow problems and eventually liquidation if the debt levels are too high.

High debt levels are used when the income and expenses are stable and predictable.

This includes situations such as property investment and infrastructure investment such as toll roads.

Low debt levels are used when income is highly volatile or unstable.

Examples of this may include seasonal industries, companies in the early stages of development and companies that operate on a project development basis such as biotechnology companies.

Gearing levels in general business operations are commonly in the 20% to 50% range.

Gearing levels significantly above 50% may indicate a risk of problems developing due to excessive debt.

In other circumstances, a low gearing ratio may indicate the excessive equity capital is tied up within the business, and the business would be better structured by reducing the equity capital and increasing debt levels.

3.5.4.1.2. Interest cover

Interest cover is a ratio that is used to measure the risk of the business facing financial distress if operating conditions deteriorate.

This can be calculated using the following formula

$$\text{Interest cover} = \frac{\text{EBIT}}{\text{interest}}$$

$$= \frac{25}{2}$$

$$= 12.5$$

An interest cover figure over five would generally indicate that the business was not at serious risk of financial problems due to debt payments if conditions deteriorated.

Interest cover figures of significantly less than five may indicate that problems could develop if conditions deteriorated.

Although the gearing ratio is often used in this context, financial survival in the short and medium term is a cash flow issue, not an asset issue.

The interest cover ratio is the measure that best highlights the buffer that exists within the current cash flow to cover the fixed cost of servicing the debt.

3.5.4.2. Profitability

3.5.4.2.1. Return on equity

The “return on equity” ratio measures the net profit of the business compared to the shareholder’s equity.

This figure can compared to alternative investment returns that may be available if the assets were sold, the debts were repaid, and the equity funds were invested in an alternative investment.

The return on equity figure can be calculated using the following formula

$$\text{return on equity} = \frac{\text{net profit}}{\text{equity}}$$

$$= \frac{16}{250}$$

$$= 6.4\%$$

The ROE is a business-based ratio rather than a market-based ratio.

The ROE only depends on the financial results, and is not affected by the value of market price of a business.

In contrast, the earnings yield is based value of the business.

The return on equity specifies the return on the capital funds that are held within the business, while the earnings yield specifies net profit as a percentage return of the business value.

3.5.4.2.2. Earnings yield

Earnings yield is a market ratio, and is dependant on the market value of the business.

This is the return that would be achieved from purchasing the business at its current value.

The earnings yield is calculated using the following formula

$$\text{earnings yield} = \frac{\text{net profit}}{\text{operational value}}$$

$$= \frac{16}{325}$$

$$= 4.9\%$$

In the case of companies listed on a stock exchange, this figure is usually quoted in the form of a "price earnings ratio", which is the inverse of the earnings yield.

$$\text{price earnings ratio} = \frac{\text{operational value}}{\text{net profit}}$$

$$\text{price earnings ratio} = \frac{\text{share price}}{\text{earnings per share}}$$

$$\text{price earnings ratio} = \frac{1}{\text{earnings yield}}$$

And also, the earnings yield may be calculated from the price-earnings ratio using the following formula.

$$\text{earnings yield} = \frac{1}{\text{price earnings ratio}}$$

For example, a company may have earnings per share of 15c, and a current share price of $1.25.

In this case, the price-earnings ratio may be calculated using the following example.

$$\text{price earnings ratio} = \frac{125}{15}$$

$$= 8.3$$

The earnings yield may then be calculated using the following example

$$\text{earnings yield} = \frac{1}{8.3}$$

$$= 12\ \%$$

Based on this figure, at the current share price and net profit level, the investment return from dividends and capital growth involved in purchasing the shares may be 12%.

The actual change in the share price may reflect changes in the company's net profit and growth outlook, changes in economic conditions, and changes in investor's interest in the company or in the stock market in general.

3.5.4.2.3. ROE vs. Earnings Yield

In cases where the market value is the same as net asset value, the earnings yield and ROE will be the same figure.

Changes to the business may affect the return on equity, however they may not affect the earnings yield greatly.

This is because a change in the business operations will be reflected in a change in the business value, with the earnings yield remaining fairly constant.

In the case of a business being purchased, the earnings yield determines the return to the investor, rather than the return on equity.

Although the ROE may be relevant in assessing the structure and general efficiency of a business, it does not correspond to the investment return from purchasing a business in cases where the purchase price is different from the net asset figure.

3.5.4.2.4. Returns on assets and equity

The ROA and ROE figures become relevant when they are low values, as this indicates that capital is tied up within the business, and is not being used.

In these situations, increases in volumes through marketing activities and product developments, reinvesting capital in new facilities, and distributing excess equity capital to shareholders may be used to increase the returns from the invested capital.

The return on assets figure is based on the operations that are conducted using the assets, while the return on equity figure is based on the operational result, and the funding mix of debt and equity that is used.

In the case of asset-based businesses such as manufacturing, the assets form the basis of the business operation.

The relationship between the operational return on assets, and the pre-tax return on equity funds, can be summarised in the following formula.

$$ROE = ROA + \frac{g}{1-g}(ROA - \text{debt interest rate})$$

In this formula, the variables have the following meanings

ROA	Return on assets
ROE	Return on equity
g	Gearing ratio

In the case of no debt and equity-funded assets, the return on equity is equal to the return on assets.

At a gearing level of 50%, as an example, the following formula would apply.

$$ROE = ROA + (ROA - \text{debt interest rate})$$

This illustrates that the effect of gearing depends on whether the return on assets is higher than the interest rate on the debt, or lower.

For a return on assets that is higher than the debt interest rate, funds are affectively being borrowed and invested at a higher rate of return, and the return on equity would increase.

When the return on assets is lower than the debt interest rate, funds are effectively being borrowed and invested at a lower rate of return, and the return on equity would decrease.

This effect is illustrated in the following graph, which shows the effect of gearing on the return on equity for a range of different return on asset figures.

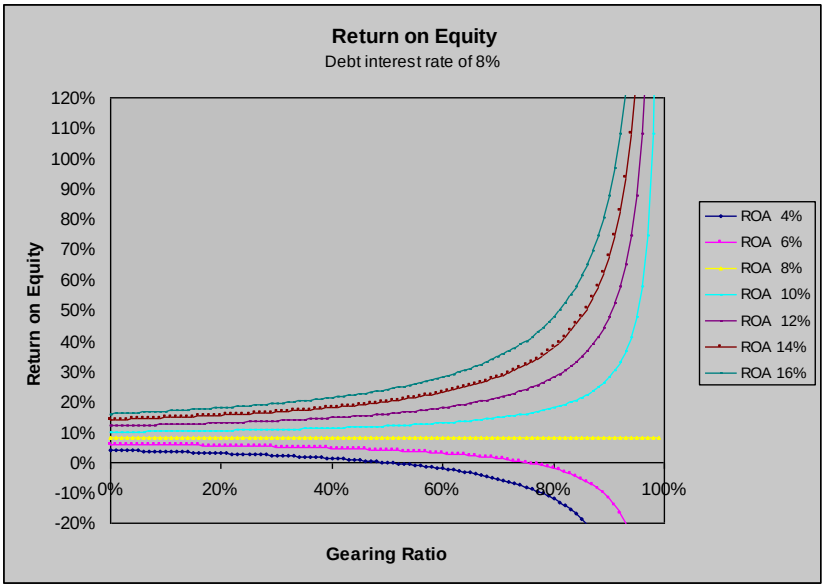


Figure 1

3.5.4.3. Improving returns

The returns on assets and equity are based on three fundamental values.

These are the following three items.

Efficiency	The cost of facilities, and the costs of production or services, in comparison to the goods or services produced.
Volume	Sales levels in comparison to the capacity of the facilities or the organisation, and in comparison to the level of capital invested.
Capital	The equity and assets invested in the enterprise.

3.5.4.3.1. Efficiency

Efficiency involves the amount of resources that are needed to produce a certain volume or a product or service.

Increased efficiency allows a particular volume to be delivered using less resources.

Efficiency may be improved through investing in new facilities and equipment and through implementing more effective procedures and processes.

3.5.4.3.2. Volumes

The volume of goods sold affects the income of the business, and possibly also the efficiency of the operation.

Costs per unit may be lower at high production volumes than at low volumes, due to the ability to spread the fixed costs of the business across a large number of items.

Volumes may be increased through developing new products, through increasing efficiency to allow prices to be lowered, and through increases marketing activities.

3.5.4.3.3. Volume & Efficiency links

Volume and efficiency are not independent effects.

An increase in efficiency may lead to an increase in sales, through the ability to offer lower prices.

Also, an increase in sales may lead to an increase in efficiency, which may occur when a greater percentage of production capacity is actually used within a period of time.

This link may create both positive and negative cycles.

In the case of increasing sales or efficiency, this may feed into an increase in the other value, and a repeating cycle of expansion may occur.

Conversely, a fall in efficiency or sales could lead to a fall in the other value, which could lead to a negative spiral of falling sales and efficiency levels.

This affect illustrates the importance of effective operation and development of the business for the long term survival and growth of the business.

3.5.4.3.4. Excess capital

Reducing the equity capital within a business, while maintain existing operations, may increase the percentage returns on the equity funds that are held within the business.

While this process may not affect the dollar return from the business, it may allow the excess equity capital to be invested elsewhere.

The return from the business is determined by the net profit and the minimum level of equity that is needed to support the business operation.

Any additional equity funds effectively earn a zero return, with the total return across all equity capital reflecting the average of the return on the necessary funds, and the zero return on the excess funds.

Where equity funds have accumulated within a business following a period of successful operation or the sale of a major asset, a capital distribution to the business owners may be conducted, to reduce the equity base to the level that is required to support the business operations.

A similar issue may arise in the case of asset values.

In situations where the existing business activities could be performed using fewer assets, then the returns on assets and equity may be improved.

3.5.4.3.5. Calculated figures vs. actual returns

Care should generally be taken in comparing return figures between different businesses, and through periods of time.

For example, one possible business structure may involve owning facilities.

These facilities would be reflected as assets on the balance sheet.

An alternative approach may involve leasing equipment or hiring facilities.

In this second approach, the value of the assets of the business may be much lower than in the case of the first business.

However, the operations of the business may be identical, and the net profit may be the same in each case.

In this situation, the return on assets figure in the second case may be much higher than in the first structure, even through the value that is created through the business activity is effectively the same in each case.

Also, in the case of service businesses that operate on a cash flow basis, the value of both the assets and the equity figures may be very low.

This may lead to high percentage figures for the returns on assets and equity.

However, these percentage returns would reflect the small value of the capital, rather than the large value of the profit.

In circumstances such as these, the earnings yield may be a more suitable measure of the returns from the business, based on the business's current value.

3.5.4.4. Capital returns issues

3.5.4.4.1. Input Vs. Output figures

The value of a business is determined by the net profit, not the other way around.

In determining a rate of return, the following sequence may be followed

Step	Variable	Type	Process
1	Business value	Independent	Determine the business value from a share price or valuation.
2	Net profit	Independent	Determine the net profit.
3	Earnings yield	Dependant	Calculate the rate of return.

This approach may be relevant in calculating a rate of return based on a current buying or selling price.

However, these steps do not reflect the fundamental nature of the interaction that occurs between net profit, rates of return, and the business value.

Effectively, the following sequence determines the relationship between the three values

Step	Variable	Type	Effect
1	Net profit	Independent	The net profit is determined by the business activity.
2	Earnings yield	Independent	A rate of return applies based on the type of business and the growth outlook.
3	Business value	Dependant	The business value is determined by the net profit and the rate of return.

3.5.5. The cost of equity

Interest payments must generally be made on debt.

The difference between the income from operations and the payments for interest determines the net profit or loss that is achieved by borrowing funds and investing the capital in business activities.

A similar expense does not occur with equity.

In the following example, a business has $100 of assets, which are entirely funded with equity.

The net profit from operations, allowing for income and expenses, including depreciation, is $3 in this example.

The figures are presented in the following list.

Assets (Equipment)	100
Debt	20
Equity	80
Income	20
Expenses	17
Net Profit	3
Return on Equity	3.8 %

3.5.5.1. Opportunity cost

This may appear to be a profitable enterprise.

However, the business includes net assets with a value of $80.

The assets could be sold, and the funds could potentially be invested elsewhere.

For example, the interest rate on bank deposits may be 5% at the time of the analysis.

If the assets were sold and the capital was placed on deposit, the return that would be earned would be $4 per year.

By retaining the funds in the form of the existing assets, the business is loosing the opportunity to receive the $4 that would be received if the assets were sold and the money was deposited.

This is known as “opportunity cost”.

Although a cash flow is not directly involved, the $80 of equity effectively has a cost of $4 per year, as this is the amount that is being lost by not investing the capital elsewhere.

This amount is also known as the “cost of equity”.

This is the same concept as the cost of interest payments on debt, although in the case of equity, cash transactions do not occur.

3.5.5.2. Excess returns

A more accurate analysis of the structure and profitability of a business may be achieved by including the cost of equity as an expense, in a similar way to the interest cost of debt.

This could be calculated using the following formula

$$\text{dollar cost of equity} = \text{equity} \times \text{equity return rate}$$

The return on equity, after adjusting for the cost of equity, could be termed the “excess return on equity”.

This figure may be positive or negative, and may indicate the difference between the return on equity of the business operation, and the returns available from alternative comparable investments.

All return figures may be negative in the case of loss-making operations, however the standard returns on equity and assets would be positive in the case of profitable business operations.

This figure would be relative to alternative investments, rather than an absolute return figure.

Adding this cost of equity as an expense, the excess return on equity could then be calculated using the following formula.

$$\text{excess return on equity} = \frac{\text{net profit} - \text{equity} \times \text{equity return rate}}{\text{equity}}$$

Assuming a cost of equity rate of 5%, the figures from the previous example could be re-stated in the following way.

Assets (Equipment)	100
Debt	20
Equity	80
Income	20
Expenses	
General expenses	17
Cost of equity	5
Total Expense	22
Net Profit (adjusted)	- 2
Excess Return on Equity	- 2.5 %

This analysis indicates that the business is achieving a negative return, in comparison the alternative investments that are available.

3.5.5.3. Asset base returns

Including a cost of equity may also enable the excess return on the asset base to be calculated, after allowing for funding costs.

This could be termed an “excess return on assets”.

A positive figure may indicate that the return from the asset base was larger than the return that would be available from investing the debt and equity funds in alternative investments.

A standard return on assets figure determines the return on the asset base, before funding costs.

Foe example, the following formula could be used to calculate the excess return on the asset base, allowing for funding costs including the cost of equity.

$$\text{excess return on assets} = \frac{\text{net profit} - \text{equity} \times \text{equity return rate}}{\text{assets}}$$

For following example presents a set of figures for the excess return on assets, after funding costs.

Assets (Equipment)	100
Debt	30
Equity	70
Income	20
Expenses	
General expenses	17
Interest	1.5
Total Expenses	18.5
Cost of equity	3.5
Net Profit (incl. cost of equity)	-2
Excess Return on assets	-2 %

3.5.5.4. The cost of equity rate

Various approaches could be taken to determining the rate to apply to the cost of equity.

One approach may involve using the same rate as the debt interest rate.

This method has an advantage in that it is simple to implement, and in that it removes any variation in the capital return figures that would be caused by changing the proportions of debt and equity.

An argument for this approach may be that the debt interest rate may approximately reflect the general level of interest rates in the economy, and that this may represent the opportunity cost that is lost be holding the capital in the form of physical assets.

Another approach may be to select a rate based on alternative investments that were currently available.

This could include other businesses of a similar description, or alternatives such as cash deposits or a rate based on broad investment returns.

Formal analysis of the cost of capital is generally based on a financial model known as the "capital asset pricing model".

This model is discussed in the section beginning on page 779.

The model estimates a cost of equity from a parameter that is related to the volatility of the business value, and the relationship between this volatility and the returns on other investments.

A simpler approach that incorporates the volatility issue may involve selecting a base interest rate, and adding a risk premium to reflect the volatility of the business income and the business value.

This is based on the affect that there is sometimes a link between the volatility of an investment return, and the average investment return itself.

The risk premium is chosen to reflect the volatility of income and asset values, with high risk premiums being added for highly volatile incomes.

The issue of risk premiums is discussed in more detail in the section beginning on page 775.

For example, a risk premium of 5% may be added for a medium-risk business.

Assuming that base rates for lending and deposits were around 8%, the cost of equity could be calculated using the following example

$$\text{cost of equity} = \text{base rate} + \text{risk premium}$$

$$= 8\% + 5\%$$

$$= 13\%$$

Risk-adjusted returns

A benefit of using a risk premium approach in the excess return on capital calculations is that this approach includes an adjustment based on the volatility of the income and the business value.

All else being equal, a stable income stream may generally be preferable to a volatile income stream.

Stable income may allow easier planning, may reduce the capital required to act as a buffer against changes in cash flow, and may provide additional options to the business, such as being able to sustain high debt levels without excessive risk.

The values placed on buying and selling businesses and other investments are generally directly related to the volatility of the income and asset values.

3.5.6. Standardising Analysis

A number of issues can affect the analysis of a set of business results.

These include mixing personal expenses with business expenses, funding arrangements such as leasing, and so on.

The following approach specifies one alternative for preparing a set of accounts for analysis that could be compared with other business and with industry averages.

This approach would also produce a set of figures that would record the pure business operation, and could be used to estimate a value for the business, or to compare ratios with alternative investments.

These changes may involve the following steps:

1. Prepare a standard balance sheet and profit & loss statement.

2. Exclude any assets used for personal purposes only, and exclude any personal expenses.

3. Add salaries for the business owners, at the equivalent level that would be required to hire staff to operate the business so that it

could be sold as an operational business, independent of the business owners.

4. Remove any property relating to general office or retail space. Also remove an equivalent amount of debt, if present. Reduce the interest paid, or increase interest earned, by an amount equal to the property value multiplied by the debt interest rate.

5. Add a rent expense for the equivalent general retail or office space.

6. Retain any specialised facilities such as manufacturing facilities.

7. In the case of leased assets, add an asset and a debt to the balance sheet. Add an interest expense at the current debt interest rate, and add a depreciation expense that is equal to the difference between the interest payment and the lease payment.

8. When calculating excess capital returns, add a "cost of equity" expense, equal to the value of the equity multiplied by the interest rate on the debt.

These steps would translate a variety of funding structures into a standardised structure that used balance-sheet assets for equipment and specialised facilities, and rent payments for general retail and office space.

The level of debt may still vary from one case to another, although debt with an equivalent value to any general property holdings could be removed.

The following example presents a sample set of figures.

A standardised adjusted set of figures is also shown, together with ratios calculated from the adjusted figures.

Initial Accounts

Assets	
Residential Building	40
Retail Space	60
Cash	30
Total Assets	130
Liabilities	
Debt	100
Net Assets	30
Sales	25
Operating Expenses	10
Personal Expenses	4
Lease Payments	4
Net Profit	7

Adjusted Accounts

Assets	
Equipment	20
Cash	30
Total Assets	50
Liabilities	
Debt	20
Net Assets	30
Sales	25
General Expenses	10
Salaries	3
Rent	2
Depreciation	2
Interest	2
Net Profit	6
Cost of Equity	4
Net Profit after equity cost	2

Gearing	40 %
Interest Cover	4
Return on Assets	12 %
Return on Equity	20 %
Excess return on equity	6.7 %
Excess return on assets	4 %

3.5.7. Interpreting analysis results

Reports, calculations and analysis can provide valuable understanding and information about the business operation.

A business cannot be managed effectively unless the key financial and operating results are calculated and reviewed.

3.5.7.1. Decision making vs. mechanical targets

Margins and ratios may be used as inputs to the decision making process, rather than being applied mechanically as targets, benchmarks and so on.

This is illustrated by the fact that two alternative structures may produce widely different ratios, even though the effective value of the business enterprise may be the same in each case.

Margin and ratio analysis may highlight issues and problems that need to be addressed.

At each stage in the operation or development of a business, different issues may arise, and current efforts may need to be focused on a range of different problems.

Reviewing and analysing the results may highlight the future directions available to the business, and the activities that should be undertaken to move the business forward.

A separate issue applies with service level agreements, where standards such as minimum availability levels are set in advance, and action may be needed if the service that is provided falls below the agreed standard.

For example, a computer support service agreement may be based on an availability level of 99.5% up-time.

While random events always occur, different issues arise if the service that is supplied is fundamentally different from the service standard that was initially set.

Requirements such as availability levels, response times to problems and so forth are commonly specified when tenders are invited for service supply contracts.

3.5.7.2. Business & Investment analysis

The financial results and statistics of a business are the results of the business operation, not the cause.

In this sense, business analysis and investment analysis have the opposite approach.

Financial investment may involve investment activities such as shares, property and bank deposits.

In these situations, the percentage return may be analysed and estimated in advance.

The percentage return is usually fixed, while the dollar amounts can vary.

For example, the same percentage return is earned whether one share is purchased or one hundred, and the same percentage return is earned on bank deposits of varying sizes.

The opposite affect may occur in business.

Business involves organising activities, managing production and so forth.

These activities produce a return after the event, not a return planned in advance.

In these situations, the dollar return is often fixed, while the percentage return changes.

An investment approach is sometimes taken to analysing businesses, rather than a business analysis approach.

In some cases an investment analysis approach is relevant.

For example, this may apply in purchasing a business as an investment, where the business will be continued as an independent operation.

This approach may also apply to projects, where the costs and sale of the project can be analysed using a financial approach.

However, in the context of continuous business activity, the investment analysis approach can lead to decisions that reduce the effectiveness of the business operation.

For example, it is sometimes assumed that the return on a business is a fixed percentage, rather than a fixed dollar amount.

This is often not the case.

Markets for products have a limited size, and equipment and facilities must generally be purchased in separate large blocks.

Under the investment assumption, it is sometimes assumed that more money can be invested in a business, and the additional funds will earn the same return as the existing operation.

The opposite often occurs, with the dollar amount staying fixed and the percentage return decreasing, rather than the percentage return staying constant and the dollar return increasing.

This happens because an investment model is used for reviewing the business figures, rather than a view based on a range of activities and operations that produce a particular outcome.

An example of this situation would be a business that developed a small successful operation.

The business may then raise funds to expand.

However, rather than the operation increasing, the existing dollar returns may continue as before.

These returns would now be spread across a wider capital base, leading to a reduction in percentage returns.

Expansion of business operations can be done successfully in a number of ways, however simply depositing additional money into a business does not generate an additional return, in the way that purchasing more shares or depositing more funds does.

3.5.8. Equity Funding vs. Business Ownership

There are two alternative views of equity funds.

3.5.8.1. Separation of ownership & control

In the case of a private business operation, the owners of the business also operate the business.

This may involve employing a range of staff members including possibly management staff, however fundamentally the business owners remain in control of the business itself.

In this scenario, the business operation could be viewed as the following steps:

- Income is received from customers.
- Expenses are paid.
- The net difference accumulates as equity funds within the business.

However, in some situations, a different view of equity can be applied.

This is sometimes known as a separation between ownership and control.

In this view, the "business" is separated from the shareholders or business owners.

Under this view, raising equity funds is simply another source of funds for the business, as an alternative to raising debt funds.

This view is particularly relevant to large public companies, where the equity capital is spread across a large number of individual shareholders, and the shareholders are not personally involved in managing the business.

This view can also be applied to private business structures, when a passive investor contributes funds to an enterprise but does not wish to become personally involved in operating the business.

Under this view, the business operations could be viewed as the following steps.

- Debt is raised from lenders and equity is raised from investors.
- Assets are purchased.
- Income is received from customers.
- Expenses are paid.
- Interest is paid on debt, and dividends are paid to shareholders.

The view of equity as a source of capital may also be applied in the case of private business structures, when equity funds are allocated for a specific purpose.

For example, equity may be kept within the business as a base for operating a portfolio of trading risks, as a capital buffer to manage cash flow, or as a capital base for banking or insurance activities.

3.5.8.2. The cost of capital

The view of equity and debt as simply two methods of funding is the view that is traditionally taken in performing financial analysis of corporate structures.

This leads to the calculation of a figure known as the "cost of capital", or more accurately the "weighted average cost of capital".

The section beginning on page 781 discusses this issue in more detail.

Essentially, this figure uses the interest rate on the debt, and an expected return on equity, to calculate an average effective cost of raising both debt and equity funds.

For example, a company may have the following figures

Debt	100
Equity	200
Debt interest rate	8%
Equity expected return	12%

The weighted average cost of capital, or WACC value, may be calculated using the following formula.

$$\text{WACC} = \frac{\text{debt} \times \text{interest rate} + \text{equity} \times \text{expected return}}{\text{debt} + \text{equity}}$$

$$= \frac{100 \times 8 + 200 \times 12}{100 + 200}$$

$$= 10.7\%$$

The business would then be viewed as a financial structure that raised funds at the rate of 10.7 %, and generated a return equal to the "return on assets" figure.

The cost of capital figure is also often used as a discount rate in a net-present-value analysis, and as a hurdle rate for the minimum rate of return required from a project before the project will be approved.

A few points can be made about this approach however.

The estimate of the "expected return" is usually based on a model of capital markets known as the "capital asset pricing model".

This is discussed in section beginning on page 779.

However, some views may hold that an expected return may be different in each situation, particularly in the case of projects rather than traded securities, and cannot be determined from the capital asset pricing model.

Also, the cost of equity approach may not be relevant in situations where the business owners directly controlled the business.

In this case, the view of equity funds as an accumulation of assets may be more relevant.

However, the cost of capital approach is widely used in corporate analysis and is an alternative view of business operations.

3.5.9. Summary of margins & ratios

Gross margin	(sales – operating expenses) / sales The proportion of sales income retained after paying cash expenses.
EBIT margin	EBIT / sales The proportion of sales income that is retained after paying all operating costs, including depreciation.
Net profit margin	(sales – net profit) / sales The net profit as a proportion of sales income.
Interest cover	EBIT / interest The number of times that gross cash flow is able to cover interest payments.
Return on equity (ROE)	net profit / equity The profit return on the net assets of the business. Low values indicate that capital is stored within the business but is not being productively used.
Return on assets (ROA)	EBIT / assets The operational return from the assets of the business.

	Low values indicate that assets such as physical equipment are being used to producing a return.
Earnings yield	net profit / operational value The return of the business at the current business value.
Gearing	debt / assets The proportion of total assets that funded from debt, rather than equity investment.

3.5.10. Financial analysis terms

Availability	The percentage of time that a facility was available for use, whether or not it was actually used during that time.
Capacity utilisation	The volume of production during a period, as a percentage of the volume that would have been produced with the facility operating at maximum capacity. This figure is also used as an economic indicator, and is calculated across the whole economy based on total production facilities.
Dividend yield	The dividend payment as a percentage of a share price. This is similar to the interest rate on a bank deposit, with the earnings yield also including any capital growth component in the share price.
Earnings	Net profit. Often expressed as earnings-per-shares, and used in valuations, such as a valuation based on twelve times earnings.
Earnings yield	The net profit divided by the business value. This would be the investment return if the business was purchased at the current value.
EBIT	Earnings before Interest and Tax. This is the earnings from the operations of the business, before payments for interest and tax.
EBITDA	Earnings before Interest, Tax, Depreciation and Amortisation. This is the gross cash flow of the business. This is the cash earnings from operations, before deducting depreciation.
Fixed cost	A cost that does not vary with the volume of production, such as building rents, depreciation, marketing and administration expenses.
Gearing	The proportion of assets funded by debt, rather than equity. High gearing levels multiply profits or losses.
Gross margin	The percentage of sales income retained after paying cash expenses.
Interest cover	The number of times that gross cash flow covers the interest payments.
NPAT	Net Profit After Tax. Also called “earnings” within investment analysis, or “net income”.
PE	Price Earnings ratio. This is the inverse of the

	earnings yield, and is widely quoted for listed companies.
ROA	Return on Assets. The return on assets as a percentage of the asset base. This figure is relevant to capital-intensive industries such as manufacturing.
ROE	Return on Equity. The net profit as a percentage return on shareholder's funds.
Variable cost	A cost that applies to each unit that is produced, including raw materials, fuel, and so on.

4. Operating a business

4.1. Services in the business environment

A wide range of services are used with the business environment in the course of operating a business.

The following list describes some of the major services and parties that are involved in business activity.

Lawyers

Lawyers advise on legal issues, prepare documentation such as contracts and trust deeds, and arrange legal action through court hearings.

In the case of small transactions and enterprises, a solicitor operating in private practice or within a partnership is often used.

In the case of larger enterprises, commercial law firms are consulted.

Large businesses generally have in-house legal staff, however commercial law firms are consulted for major transactions, and for conducting legal action.

Chartered accountants

In the case of small enterprises, accountants may prepare financial statements, tax returns and associated information.

This information is generally prepared in-house by larger organisations.

In the case of larger businesses, external accounting firms often perform the auditing functions.

This involves an independent review of the methods used to prepare the accounts, and a signed declaration that the accounts have been reviewed, and that in the auditor's opinion, they have been prepared in accordance with the accounting standards.

Some accounting firms also perform business analysis of financial results.

Contract services

Contract services involve an on-going set of services, performed by an external organisation.

Contract administration may involve processing payments from customers, raising invoices and statements, and managing credit collection.

Contract computer support may involve support of hardware and software problems.

This can range from directly addressing individual problems, to the complete hardware, software and information technology infrastructure being supplied by the service provider.

Contract maintenance services are available for maintaining equipment in some circumstances.

Individual services

Individual services apply to specific transactions, rather than an on-going service agreement.

This includes areas such as construction of new facilities, advertising campaigns, computer software development, design of brand logos, function management and so on.

Business brokers

Business brokers arrange the buying and selling of small and medium sized businesses.

A business broker may also maintain lists of individuals seeking to make private equity investments in a business, and businesses seeking passive equity investors.

Valuers

Valuers perform valuations of assets.

Valuations are used for preparing balance sheets, for assessing an asset as security for a loan, and when deciding whether to buy or sell an asset.

Valuations are performed for properties and businesses.

Smaller firms may value a specific type of asset, such as businesses, while larger firms may perform a wider range of valuations.

Other assets that can be valued include brand names and trade marks.

Banking

Banking provides facilities for holding balances of cash within bank accounts.

Banks also provide loans, arrange leasing of equipment, provide cheque and electronic transfer of payments, and provide foreign exchange services.

Stock brokers

Stock brokers arrange the trading of shares through a stock exchange.

An individual cannot buy shares directly from another individual through a stock exchange.

In order to buy or sell shares, an account is opened with a broker.

The client then places an order with the broker to buy or sell a certain number of shares of a particular company, and the broker places the order in the market.

When this is matched with a buy or sell from the opposite side of the transaction, a trade is executed.

This is settled between the two brokers several days later, with the cash and share scrip being exchanged on the settlement day.

If the selling client fails to deliver the share scrip, or the buying client fails to provide the funds, then the broker steps in and fills the other side of the order directly.

This mechanism effectively provides a guaranteed settlement of each trade, regardless of the actions of any particular person buying or selling shares.

The settlement mechanism is a major reason for the large volume of trading that takes place through stock exchanges.

Stock brokers also provide investment advice on share investment, organise the public float of companies on to the exchange, and manage funds directly for clients.

Investment bankers

Investment bankers perform services related to raising capital, and company takeovers.

This is in contrast to commercial or retail banks, which maintain a balance sheet of loans and deposits.

Investment banks arrange the public float and listing of companies, provide advice to companies during transactions such as corporate takeovers, and may provide underwriting services.

The investment bank may also assist in the preparation of a prospectus for a float, equity or debt issue.

Underwriting by an investment bank or stock broker involves providing a back-up facility during a public float.

If the full set of available shares is not purchased by the public, the bank may step in a purchase the remaining shares directly.

This parcel of shares is then generally transferred to major institutional investors under a sub-underwriting arrangement.

Fees are charged for the underwriting and sub-underwriting services.

Advertising agencies

Basic advertising such as mail-outs to existing clients and leaflets can be organised directly by the business.

However, more complex activities such as magazine advertisements, television commercials, and major advertising campaigns are created by advertising agencies.

These agencies develop a marketing campaign, create the presentation material, and organise the appearance of the material according to the type of activity and the budget that has been specified by the client.

Promotion agencies

Promotions agencies organise and conduct promotions of the business's products.

This may involve distributing sample products at major events, and organising activities ranging from concerts to end-of-year functions.

Some larger organisations also organise promotions internally, with the staff involved in operating a function provided by the promotions agency.

4.2. Financial Management

4.2.1. Cash flow management

Cash transactions are generally recorded as they occur, with internal records balanced against bank records on a regular basis.

Reports of income, expenses and net cash flow may be produced on a weekly or monthly basis.

Working capital involves cash balances held at banks and unused available overdraft limits.

4.2.1.1. Cash balances

Adequate levels of working capital need to be maintained to meet unexpected changes in cash flow.

When major expenses will be due for payment on future dates, these should be included in operational plans so that sufficient funds can be maintained to meet the payment when it becomes due.

Under an accrual accounting system, sales may be booked as income when they occur, rather than when payment is received.

This can lead to highly misleading financial statements from a cash flow perspective.

In these cases, records of physical cash levels also need to be kept, in addition to the accounting records of income invoiced to clients, and expenses incurred.

4.2.1.2. Credit terms

Credit is often extended to customers, particularly in dealings with other businesses.

Terms may include 14 days, 30, 60, 90 or 180 days in some cases.

The purpose of a long credit term is to allow a customer to purchase the supplies, manufacture a product, sell the finished product, and use the proceeds from the sale to pay for the initial supplies.

Without this credit, customers with low available cash balances would not be able to purchase the business's products.

This arrangement is particularly relevant to seasonal businesses that may have one large sale period during the year.

A long credit term may also apply in cases where a large order was processed for a specific production run, rather than regular monthly orders as part of continuous production.

However, long credit terms can become a permanent feature of a supply arrangement with a customer.

Long credit terms create many problems for a business, and in general, short credit terms should be used wherever possible.

For example, expenses must be funded from working capital, and a large increase in orders may lead to insufficient funds if income is not received for an extended period of time.

Also, conditions may change significantly over the period of the credit, with sales rising or falling, and the delay between the cause-and-effect of the invoicing and payment may reduce the flexibility of the business to adapt to changed conditions.

Customers may build up a large value of outstanding accounts, which could damage the business if the customer defaulted on payment.

With short credit terms, a customer default would be recognised quickly and may result in a smaller loss.

Also, a long credit period leaves a greater scope for problems developing within the customer, ranging from a deteriorating financial position to lost records, and these problems may be less likely with short credit terms.

Paying accounts that are due on short notice as standard practice allows for the possibility of temporarily extending payment in unexpected situations, while waiting until the end of credit terms as standard practice does not leave any room for flexibility when expected problems arise.

4.2.1.3. Credit collection

During general business operations, a percentage of customer payments will not be received by the due date.

An initial process may involve reminder letters and possibly telephone calls.

An additional fee is sometimes added to overdue accounts to cover administration costs.

If payment is still not received after these steps are taken, a debt collection agency can be used.

These agencies operate a business based on collecting overdue accounts.

In cases where the debt is not recovered after initial attempts are made, the business can file an application with a court to have the debtor's affairs wound up through a bankruptcy process.

In some cases, disputes involving small amounts can be heard in a small claims tribunal or other setting that involves a judgement of the claim, without the cost and complexity of a full court hearing.

In the case of small amounts, failure to collect the debt after various steps are taken may involve writing off the debt.

This involves accepting the debt as lost.

An expense is raised to recognise the loss, and the value of the "accounts receivable" asset on the balance sheet is reduced by the same amount.

A provision is generally included in the balance sheet to allow for bad debts.

4.2.1.3.1. Reducing bad debts

Losses due to bad debts may be limited in a number of ways.

Payment in advance

In the case of sales of products to the general public, most businesses require payment in advance before goods are delivered.

However, in the case of services, and products supplied to businesses, an invoice is often raised after the service has been performed or the item has been delivered.

In the case of variable usage of a product, charging in advance may not be practical.

For example, telephone services and utilities such as electricity are charged at the end of a period of usage.

In these cases, defaults of payment may lead to discontinuing the service.

Risks with future dealings with the same customer may be reduced by requiring a deposit in advance, or pre-payment of fixed amounts of supply.

Deposits, partial payment and progress payments

In the case of delivery of large items, such as capital equipment, deposits or partial payment in advance can be used to reduce the size of the loss if the complete payment is not received.

In the case of long projects, payments at regular intervals, when project milestones are reached, or when project stages are completed may reduce the chance of losses occurring due to defaults on payments by clients.

Short credit terms

Short credit terms may prevent a single customer from accumulating a large outstanding balance, which may result in a large loss if the customer defaults on the payment.

Also, this approach may reduce the chance of problems arising within the customer's financial situation between the time that the product is ordered, and the time that the payment becomes due.

Escrow accounts

In the case of large project developments, funds may be deposited by the client in an escrow account held by a commercial trustee, and released when the project has been completed or the equipment has been delivered.

This process involves the client depositing the funds in the name of a commercial trustee, before the business commences the project.

When the project is completed, the trustee then releases the funds to the business in payment for the project development.

4.2.1.3.2. Factoring

In cases where there is a large value of accounts receivable, a factoring service can be used.

Factoring involves the factor service purchasing the accounts receivable at a discount from the business.

In effect, the factor service pays the business the value of the accounts receivable immediately, less an amount for bad debts and the factor's fees, and takes over collection of the debts themselves.

This method can be used by the business to receive the income from accounts in a shorter time, when there may be a large value of accounts due with long credit terms.

Also, factoring removes some of the administrative burden from the business, which is then handled by a specialised agency.

4.2.1.3.3. Securitising debts

Money that is owed to the business is an asset, as this represents a payment that may be received in the future.

In the case of large business enterprises, receivable amounts may sometimes be "securitised".

This involves converting the debt to a tradable security, which a similar in nature to a share or a bond, and that can be sold to receive the funds before the debt is due for repayment.

In the case of short-term accounts receivable, this process generally involves "bank bills".

Where the customer is a large corporation that has a strong credit position, a bank may guarantee payment of the debt in return for a fee.

The debt then becomes known as a bank bill, and can be readily sold in the capital markets.

The credit risk of a bank bill is based on the credit risk of the bank, and has a similar credit risk to a direct bank deposit.

Bank bills do not involve interest payments, but are sold at a discount to their face value, to reflect an interest value over the period.

For example, a bank bill may have a face value of $100 and may involve a payment of $100 in 90 days time.

The bank bill may be sold for $98, for example, with the $2 difference between the current cost and the face value representing the interest return on the investment.

There is a large and liquid market in bank bills in Australia, with the majority of bank bills involving terms of 90 days.

(** check details of issuing/customers etc)

4.2.1.4. Reducing cash flow volatility

Volatile cash flows may cause a number of problems for a business.

A large buffer of capital may have to be maintained to smooth rises and falls in funds due to the timing of cash flows.

Raising debt may be difficult, and the debt capacity of the business may be reduced, with lower levels of debt being able to be supported than equivalent businesses with more stable cash flows.

Also, planning specific events, or determining likely time frames for business development may be more difficult, as timeframes may be less certain than with a business having stable cash flows.

A number of steps may be possible to reduce the volatility of cash flows.

These could include some of the following:

- Changing lump-sum payment arrangements to payments based on instalments, such as progress payments through a project development.
- Reducing credit terms offered to customers.
- Including deposits from customers in addition to payment on delivery.
- Performing several small projects rather than a single large project.
- Using hedging methods to reduce volatility due to foreign exchange rates with imports or exports.
- Altering the business to perform several different activities.

4.2.1.4.1. Diversification

Performing several activities may have smoothing effect on cash flows, and reduce problems with situations where a period of high income occurs, followed by long periods of low income.

The effect of performing several independent activities is illustrated in the following table.

This table shows the volatility of the total business income, compared with the volatility of an individual activity.

Reduction in risk or volatility with diversification

Number of Activities	Volatility
1	100%
2	71%
3	58%
4	50%
5	45%
10	32%
100	10%
1000	3%

Table 1

This table illustrates that splitting the business into two independent activities would reduce the volatility by almost one-third, to 71%.

Operating four separate activities would reduce the volatility to one-half of the original volatility.

This effect may also apply to other situations where a single event in split into several separate events.

For example, this table may illustrate the reduction in risk that may occur when a business operates with a wide client base, rather than with one or two large clients.

This analysis is based on a statistical formula.

This approach assumes the following three points:

- The activities all have the same volatility of income.
- The activities are independent, with each one changing randomly, independently of the other activities.
- The business income is split evenly across all the activities.

When these conditions are met, the volatility reduces to the following formula.

$$\text{total volatility} = \frac{\text{individual volatility}}{\sqrt{\text{number of items}}}$$

For example, the volatility of each individual risk may be 15%.

In the case of 10 risks, the total volatility could be calculated using the following example.

$$\text{total volatility} = \frac{15}{\sqrt{10}}$$

$$= \frac{10}{3.2}$$

$$3.1\%$$

This principle is known as “diversification”, and is one of the main principles used in business and finance.

This approach is used to reduce the risk or portfolios of insurance policies, bank loans, and investment portfolios.

In the case of general business activities, specific figures could not be applied.

However, the effect could still be dramatic in some cases.

For example, in a seasonal business that operated mainly in summer, expanding into another summer activity would have little impact on volatility.

However, expanding into a winter activity, as well as the existing summer activity, could have a large impact on the stability of the business income through the year.

Simply expanding a business into another area that was independent of the existing operations could have a stabilising impact on cash flow.

Focus, efficiency and excessive diversification

The diversification concept was the principle behind the large diversified conglomerates that were created in the 1980's.

However, in that case, the model was not particularly successful.

The operations included dozens, and in some cases hundreds, of separate business operations.

When this happened, there was little scope to properly manage and develop each individual business.

In many cases, the most successful business approach is to focus the full resources of the business on a single activity or operation, and simply accept the volatility that may be associated with that approach.

Production is generally most efficient when a large volume of a simple process is performed, rather than a wide range of individual activities.

Positive and negative risk

Diversification reduces volatility.

In the context of business and investment, this is generally a positive development.

However, while this reduces the chance of major negative returns, it also reduces the chance of major positive returns.

In a statistical sense, this is purely symmetrical.

In other terms, the chance of a positive return is reduced by exactly the same amount as the chance of a negative return.

Average returns

A separate effect relates to the average returns.

When a range of separate items are combined, some will have a positive return, some will have a negative return, and some will have average returns.

Combining these together tends to lead to the total amount having an average return.

This is no accident.

This effect occurs because, when all items are included, the total must equal the average.

In fact, this is the definition of the average.

The implication of this for business and investment is that adding a large number of activities, business units, products or other items into a mix will tend to produce return that falls towards the average, unless careful selection and management of the combination is carried out.

Although there are disadvantages to diversifying into separate products of activities, this approach may be relevant to seasonal industries, and cyclical industries that involve unstable patterns of sales.

4.2.1.4.2. Calculating volatility

In the case of business finances, a small number of individual figures are generally involved.

This may limit the use of statistical analysis methods.

However, when a series of figures are available, such as the monthly cash flow figures over a two year period, the volatility of the cash flow could be assessed using mathematical approaches.

This would enable a trend in volatility to be determined.

This approach may be relevant to business operations that have reasonably stable operations over a long period of time, with volatility gradually increasing or reducing.

The most common measure of volatility is the statistical measure known as the “standard deviation”.

The standard deviation is a measure of how widely dispersed a set of number are.

In the case of a data series of similar values, the standard deviation may be a low figure.

In the case of numbers that vary widely, the standard deviation may be large.

The standard deviation can be considered to be similar to the average deviation for each data point from the average value.

Strictly speaking, it is calculated as the square root of the average squared deviation from the average.

A standard deviation calculation function is available on most pocket calculators that include statistical functions, and in computer software such as spreadsheet programs.

For example, the following table contains a list of cash flows.

The average monthly cash flow for the previous twelve months is listed, along with the standard deviation over the year.

The average monthly cash flow remains constant at around 1,000.

For first twelve months, with average was 998, with a standard deviation of 12.

This is roughly equivalent to suggesting that the cash flows, on average, were about 12 more or 12 less than the central point of 998.

However, the table also shows that the volatility is steadily increasing.

By the end of the third year, the standard deviation had risen from 12 to about 18.

This increase in volatility may not be obvious simply from viewing the list of raw figures.

A change in volatility such as this may require an increase in working capital levels to avoid the risk of having insufficient funds to meet payments, or some other review of current operations and processes.

	Cash Flow	Average	Standard Deviation
Jan 1	1,003		
Feb 1	987		
Mar 1	984		
Apr 1	998		
May 1	1,011		
June 1	1,007		
July 1	1,010		
Aug 1	986		
Sep 1	1,011		
Oct 1	1,009		
Nov 1	988		
Dec 1	980	998	12
Jan 2	1,004	998	12
Feb 2	995	999	12
Mar 2	1,020	1,002	13
Apr 2	1,018	1,003	12
May 2	1,001	1,003	12
June 2	1,013	1,003	13
July 2	996	1,002	13
Aug 2	1,015	1,004	13
Sep 2	1,015	1,005	12
Oct 2	1,018	1,005	13
Nov 2	1,014	1,007	13
Dec 2	991	1,008	13
Jan 3	997	1,008	10
Feb 3	975	1,006	14
Mar 3	1,010	1,005	13
Apr 3	1,014	1,005	13
May 3	983	1,003	14
June 3	971	1,000	17
July 3	980	999	17
Aug 3	988	996	17
Sep 3	1,022	997	18
Oct 3	975	993	18
Nov 3	989	991	17
Dec 3	982	991	16

4.2.2. Funding and capital management

Capital is a large block of money.

In a more general sense, capital is a large block of value, and may be stored in the form of cash, a physical asset such as a building, or an intangible asset such as a patent.

Capital is used within businesses for various purposes.

This includes purchasing assets such as equipment, funding project developments, and funding loss-making situations such as the start-up phase of a new business.

Working capital is the buffer of funds that is maintained to meet timing problems with general operating cash flow, where payments and income may arrive at random times, and payments may have to be made before income is received.

4.2.2.1. Sourcing capital

Capital is sourced in two ways.

Debt involves borrowing funds.

Interest costs must be paid, and the debts must generally be repaid according to a schedule.

Raising debt does not affect the ownership or control of the business.

Equity is the net assets of the business.

The net assets are the total assets of the business, less any debts or other liabilities.

Equity capital refers to funds sourced from the business owners, or held within the business and indirectly owned by the business owners.

Rasing equity involves transferring assets into the business, which may come from the existing business owners or from new investors.

Raising capital, from either debt or equity, results in the total assets of the business increasing.

This involves transforming the business into a larger enterprise.

The net assets of the business are only affected by raising or distributing equity, not by raising or repaying debt.

In the case of public companies, raising equity does not generally affect the control of the business.

In these cases, the shares are generally spread across a large number of investors, both before and after the capital raising.

In the case of raising equity in a private business structure, this may involve the existing business owners transferring additional assets into the business, or it may involve bringing new parties into the ownership and control of the business.

4.2.2.2. Equity ownership vs equity capital

Equity can be viewed in two different ways.

One perspective views equity as the ownership of the business assets.

An alternative perspective views equity funds as a source of capital, that is raised as an alternative to raising debt.

Both views are simply different perspectives on the same situation, and equity is both a source of capital, and the ownership of the business assets.

However, each view may be relevant in different circumstances.

The ownership view may be particularly applicable in the case of small enterprises, when private and business assets are combined, and when a business structure is owned and operated by a small number of individuals.

The capital view may be applicable in the case of large public companies, where the shares may be spread across a large number of individuals, when capital is raised to fund activities such as banking and insurance, and when capital is allocated for purposes such as working capital or to provide a base for a risk portfolio.

4.2.2.3. Debt vs. Equity

There are a number of issues that may affect the decision as to whether debt or equity should be raised when capital is needed for a purpose such as purchasing an asset.

These include the following points.

Availability

In some situations, debt may be easy to raise and equity may be impossible, while at other times, equity may be easy to raise and debt may be impossible.

In some circumstances, modest amounts of either debt or equity could be raised at will.

At other times, neither debt nor equity could be raised, and the business would have to survive using the resources that it currently had, or become insolvent and be liquidated.

The availability of debt or equity may effectively make the decision as to which one is used, regardless of other issues.

In the case of smaller enterprises, raising equity would involve sourcing additional funds from the existing business owners, or locating another investor who would wish to invest funds in the business.

Bringing additional parties into the control of the business is a major step, and would usually only be done when a decision was made to make a major change in the structure and operations of the business.

Alternatively, the existing business owners could transfer additional personal assets into the business.

However, in many cases the majority of a business owner's assets may already be held within the business.

In the case of debt for small enterprises, this would depend on the trading history and stability of the business, the capital strength of the equity within the business, and any collateral or guarantees that could be offered to lenders.

In the case of larger businesses, raising additional equity would usually be straightforward unless the company was in extremely serious financial trouble.

Raising equity to stabilise a company that had deteriorated into a generally poor operating condition is not uncommon in the case of large enterprises.

In the case of debt, the availability of debt would depend on the stability of the business.

If the business was operating successfully, raising bank debt would usually not be difficult, unless the company already had a high level of debt.

A business operating at a loss, or in poor financial condition, may have trouble raising additional bank debt or rolling over existing arrangements.

Raising debt from the general public by issuing bonds is usually only practical for very large companies in a strong financial position.

Cash flow

Debt generally involves regular interest payments.

These interest payments may be a drain on cash flow.

Also, interest payments are a fixed cost, and do not vary with the level of production, or the level of sales.

This increases the chance that negative cash flow and financial distress may occur during times when sales are slow.

The risk to a business due to high debt levels can be significant.

Insolvency and liquidations are usually associated with high debt levels.

This is due to the high fixed cash outflow required to meet interest payments.

If operating conditions deteriorate, there may be insufficient net cash flow to meet interest payments.

Dividends are often paid during regular operation.

However dividends are optional, and can be cancelled during times of cash flow problems of low equity resources.

Control

The choice between debt and equity is not generally a significant issue for the control of a public company.

In the case of a private business structure, this may have major implications.

Debt allows the existing business owners to retain ownership and control of the business.

Raising equity from other investors in this case would involve reducing the ownership to only part of the business, and difficulties with decision-making and control may arise between the existing investors and the new investors.

Returns

In cases where the return from the assets is greater than the interest rate on debt, raising debt would increase the returns from the business.

However, there are two limitations to this.

First, if the return on assets is lower than the debt interest rate, then borrowing funds would lead to a reduction in net profit.

Also, the gearing affect magnifies losses, as well as profits.

If a business with a high debt level entered a period of slow sales, the equity capital could be quickly erased, and the business could become insolvent.

Risk

Raising debt instead of equity increases the risk to the business.

This is due to the cash flow problems that could be caused by the interest payments, and also due to the gearing effect, which increases the rate of losses during a period of low activity.

Debt & Equity mix

Considering the advantages and disadvantages of debt and equity, most general business operations use a mix of both.

Common gearing ranges are debt levels of 20% to 50% of total assets, with the remaining 50% to 80% being equity funds.

This allows the benefits of debt to be realised, without placing the business at excessive risk.

4.2.2.4. Capital ratios

Gearing

The split between debt and equity within the business is generally measured using a "gearing" ratio.

The ratio of debt to equity is sometimes used.

Another common approach is a gearing ratio based on the level of debt as a percentage of total assets.

This value can be calculated using the following formula.

$$\text{gearing} = \frac{\text{debt}}{\text{assets}}$$

For example, a gearing ratio of 20% in this case would indicate that 20% of the assets were funded with debt, and 80% where funded with equity.

In this example, the equity value would be equal to four times the debt value.

In the case of a business with $30 of debt and $100 of assets, the gearing ratio would be 30%.

Gearing ratios in the range of 20% to 50% are common for general business operations.

Start-up operations and businesses with highly unstable income may not have any debt at all.

At the other extreme, assets with highly stable cash flows, such as toll roads, are often held within structures having very high gearing levels.

For example, a gearing rate of 90% would imply that nine dollars of debt was borrowed for each dollar of equity held.

Interest cover

Survival in the short and medium term is mainly a cash flow issue, not a profit issue.

Profit includes the rise or fall in the value of assets, as well as the effects of cash flow.

Debt payments, however, can only be met from cash holdings.

The "interest cover" ratio is a ratio that measures the proportion of cash flow that is used to meet debt payments.

A low interest cover ratio indicates that a large proportion of net cash flow is being used to cover interest payments.

This may suggest that debt levels are too high, and that the business is at risk of negative cash flow and insolvency if operating conditions deteriorate.

The interest cover ratio may be calculated using the following formula.

$$\text{Interest cover} = \frac{\text{Earnings before interest \& tax}}{\text{net interest paid}}$$

An interest cover ratio of 5 would suggest that 20% of cash flow was required to meet debt payments.

Although the interest cover ratio varies greatly depending on the type of business and the industry, figures of less than 5 may indicate that the business is at risk of cash flow problems if operating conditions deteriorate.

Gearing ratios are often used to asses whether the debt level of a business is too high in a structural sense.

However, cash flow ratios such as interest cover are a more accurate guide as to whether the business is at risk of financial distress.

4.2.2.5. Debt

4.2.2.5.1. Uses of debt

Debt involves borrowing money.

Debt is widely used in business.

Most businesses have some debt, and many business activities cannot be conducted effectively without the use of debt.

Large sums of money may be required for the purchase of equipment, building facilities, funding projects and general expansion of the business.

This capital can be sourced in two ways.

Money can be raised as debt.

Alternatively, equity funds can be sourced from the existing business owners or from other investors.

Raising equity is not always possible, as in many cases investors who have an interest or willingness to invest money in the business cannot be found.

Also, sourcing equity funds involves giving up partial ownership and control of the business to other parties.

In the extreme case, this may lead to the original business owners loosing control of the business, and eventually withdrawing from the business operation.

The use of debt is also important from a capital management perspective.

The returns from a business are generally optimised when a particular mix of debt and equity funds is used.

In general business operations, debt is often in the range of 20% to 50% of total assets, with the remaining funds being equity funds.

The effective use of debt is an important issue in the operation and development of a business.

4.2.2.5.2. Sources of debt

4.2.2.5.2.1. Associated parties

Debt is sometimes raised directly from parties associated with the business.

This may include loans from relatives, and loans from the existing business owners to the business itself.

This particularly occurs during the start-up phase of small enterprises.

4.2.2.5.2.2. Personal lending

Personal lending involves borrowing from banks and other organisations as a personal borrowing arrangement.

This may involve personal loans, mortgages against property, and other forms of personal lending.

This approach is often used for funding part-time business activities, and for raising funds for the start-up phase of a small enterprise.

Personal lending is generally only available to individuals who have a stable income.

This may be a salary from a full-time or part-time occupation, or some other source of regular income.

Unsecured lending is available for small amounts, while large loans generally require security, such as a mortgage against a property.

The amounts that are loaned are generally calculated as a multiple of the available income.

For example, a mortgage loan may be approved up to a size that results in the repayments being less than 25% of the gross salary.

Longer term loans have smaller regular repayments than short term loans, and residential mortgages often have terms of longer than 20 years.

4.2.2.5.2.3. Banks

Banks are the source of most business lending, apart from the very largest organisations, who access the capital markets directly.

Major bank facilities include the following:

Overdrafts	A floating loan balance, general attached to a cheque account, that allows payments to be made in advance of receiving income to manage timing differences in cash flow.
Leasing	A loan attached to the purchase of an item of equipment. The equipment is used as security for the loan.
Loans	Standard bank loans. For example, a five year loan with interest payable monthly and the principal repaid on the maturity date. A loan may be secured against an asset such as a property, or may be unsecured.

Business overdrafts are common, and once a regular pattern of income and expense payments had been established, overdrafts may normally be extended without great difficultly.

Loans may require collateral such as a mortgage on a property, or personal guarantees, unless the business has equity capital and a stable positive cash flow.

In the case of general business lending, banks would normally extend debt facilities up to a level that was equal to the amount of equity capital, as long as the business cash flow was positive and reasonably stable.

In these circumstances, the value of the business assets could fall by one-half before losses occurred on the loan balance.

A lease may be easier to arrange than a standard bank loan, as a lease is a secured form of lending.

Also, a lease is effectively an amortising loan, which is a lower risk form of lending than the separate interest-only and principal repayment structure that is common in business debt.

4.2.2.5.2.4. Leasing and Finance companies

Finance companies perform lending services, however they are not licensed to accept deposits from the general public in the way that banks are able to.

The funds used by finance and leasing companies are sourced from investors and wholesale capital markets.

Finance companies specialise in leasing arrangements with equipment, and in retail credit involving items such as goods being purchased by a customer by instalments.

Interest rates may be higher on these loans than bank loans, as finance companies tend to operate in a higher-risk part of the loan market, and they do not have access to the low-interest funds that banks hold in cheque accounts and other facilities.

In other cases, interest rates may be the same or lower than banks, however there may be a wide variation between different arrangements, particularly in the case of small transactions.

Also, the total cost of the item involves both the purchase price and the interest rate.

A high interest rate may represent a low total price if the sale price itself is low, while a low interest rate may apply to a high total price if the sale price itself was high.

However, when the credit term extends over a period of more than one or two years, the interest rate may have a significant impact on the total cost of the purchase.

In the case of large transactions, such as the leasing of large items of equipment, interest rates are generally highly competitive across a broad range of lenders, and the interest rate may be a small margin above wholesale interest rates.

4.2.2.5.2.5. Customer payments by instalments

A finance company can be used to offer an alternative payment method to customers.

In the case of large transactions, the business may handle the financing issues involved in offering to accept payment in several instalments.

In the case of sales to the general public, however, the business itself does not usually handle the financing arrangements directly.

This is a specialised area involving raising funding, interest calculations and administration, collecting overdue accounts, bad debts and so forth.

In this arrangement, the finance company pays the business the full sum for the sale of the item when the sale occurs, and then collects the instalments directly from the customer.

Depending on the arrangement, the amount paid may be the same as the full sale price, or it may include a discount.

For example, a business may offer interest-free payments for the purchase of an item.

This is equivalent to offering a discount on the item and selling it at a lower price, due to the interest saving by the customer.

In these cases, the finance company would pay a reduced amount to the business, to allow the finance company to collect the equivalent interest amount, while the business would include this discount as a cost of achieving a sale at a lower margin.

However, although interest-free terms have a financial value, this may also be built into a higher sale price, and so a direct comparison with competitor's products would have to consider the sale price as well as the purchase terms.

Although in general the cost of the finance would be equal to the difference in the sale prices, this may be a valuable service to offer to customers.

This may occur for two reasons.

Payment by instalments reduces the cash flow burden with making a single large payment, both by a business or by an individual.

Also, this financing approach may involve less difficultly in credit assessment and inconvenience than the customer attempting to source a loan using other methods of lending.

This financing approach is commonly offered in sales of large items to the general public.

4.2.2.5.2.6. Vendor Financing

Vendor financing occurs when the seller of an item provides the financing terms.

This generally involves accepting payment in instalments over a period of time.

Interest costs are generally included within the instalments, with the total amount of the instalments being a larger figure than the original price.

Vendor financing is common in the sale of businesses, and in the sale of large items of manufactured equipment.

Interest rates may vary, however in the case of large items the interest rate may be a competitive figure.

These transactions are generally conducted as a way of increasing the number of sales of the equipment, rather than a profit-making exercise based on the interest charges themselves.

In the case of the sale of a business, credit assessment of the buyer may not be a major issue, as the payments for the business purchase would come from the cash flows of the business itself.

4.2.2.5.2.7. Capital markets

Accessing the capital markets directly involves raising money from the general public.

This involves the issue of a prospectus.

Funds are then subscribed by investors, and the business pays interest on the debt and repays the principal at a future date.

Most funds raised in this way are structured as bonds.

This generally involves regular interest payments, usually half-yearly, with the principal repaid in a lump sum at the end of the period.

The interest rate is usually fixed for the period of the bond.

These bonds are sometimes listed for trading on stock exchanges.

This allows an investor to sell the bond and recover their funds before the bond term expires.

However, if the general level of interest rates has risen or fallen since the bond was issued, the bond interest rate may be more or less attractive than current interest rates

In general a capital gain or loss may occur if the bond is sold prior to maturity.

This capital gain or loss occurs regardless of whether the bond is sold or not, as the fixed interest rate may be higher or lower than the floating interest rates that are available on a future date.

Accessing the capital markets directly is generally only available to large organisations with stable business operations.

Credit rating agencies such as Moody's and Standard & Poors issue credit ratings of bonds, including bonds issued by governments and large corporations

These range from AAA being the highest grade, down to AA, A+, BB and a series of other ratings, with lower ratings indicating a higher chance of default.

4.2.2.5.2.8. Junk bonds

Junk bonds are bonds issued by smaller enterprises, or businesses with unstable income.

These bonds carry a high interest rate, to compensate for the significant chance of a default on the bond payments.

There is no developed junk bond market in Australia.

Junk bonds may carry high interest rates, such as interest rates in the range of 16% to 20%, to compensate for the risk of default on the bond payments.

It is very difficult for a business to generate a return above this level, which would allow it to raise capital using junk bonds and finance a project that produced a positive net return after interest costs.

However, in the United States, the junk bond market expanded rapidly during the 1980's, and a large and liquid junk bond market developed.

Following the stock market crash of 1987 and the recession of the early 1990's, many companies defaulted on payment and the junk bond market shrank considerably.

A number of scandals were also involved at the height of the market, which later came to light following the collapse of the market.

Junk bonds are still traded in the US, on a much-reduced scale.

4.2.2.5.3. Borrowing

In the same way that a decision to purchase a product is made by the customer, not the business, the decision to extend a loan is made by the lender, not the borrower.

Lenders are naturally cautious.

At an interest rate of 5%, it would take twenty years to recover the initial principal of a loan by accumulating the interest payments.

If the business performs well, the bank or other lender does not receive any benefit.

Interest payments continue as before.

However, if the business fails and is liquidated, a partial or complete loss of the loan capital may occur.

Without the benefit of positive risk, lenders generally are not willing to accept significant negative risk either.

In many cases a business will not be able to borrow when it would wish to.

However, various steps can be taken in structuring and operating a business that may improve the ability of the business to raise debt.

4.2.2.5.3.1. Collateral

Collateral involves the lender holding a mortgage against a physical asset, as security for a loan.

This occurs in property mortgages, and leasing of equipment.

In the case that the business defaults on the loan repayments, the lender can then sell the asset to recover the funds.

Collateral is a major issue in lending.

A loan arrangement that holds security over an asset is known as a secured loan, while a general loan to the business is known as unsecured loan.

Secured lending has a much lower risk than unsecured lending, particularly if the loan is equal to only part of the asset value, rather than the full asset value such as a lease arrangement for an equipment purchase.

If a business can offer an existing asset as collateral, or if the business ties the loan to the purchase of a physical asset, then lending may be extended based on a reasonably stable cash flow stream.

This is the case when a property is purchased using a loan, or when equipment is leased.

4.2.2.5.3.2. Guarantees

In the case of general lending for business expansion, banks may often required personal guarantees from directors, investors and parties involved in the business.

This particularly occurs with small enterprises.

This issue does not usually arise in mediums sized and large businesses, as the assets within the business and the amounts of money borrowed are usually much larger than the personal assets of the individuals involved.

A personal guarantee ties the individual's personal assets to the loan.

If the business defaults on payments, then the individual must meet the loan repayments.

This is one mechanism by which a business insolvency can also lead to personal bankruptcy of the business owners.

Although guarantees are often given reluctantly, in some situations a decision must be made as to whether to proceed with the loan on a guarantee basis, or whether to abandon the option of borrowing at that time.

Any party offering a guarantee for a business loan should generally consider the situation carefully, and assume that the worst-case situation may occur, in which case they will be personally liable to repay the full amount of the loan.

4.2.2.5.3.3. Stability of cash flow

Stability of cash flow and collateral are the two largest issues involved in a lending decision.

Stability is a highly important issue in assessing a business loan.

A business that has a steady level of modest profit is much preferred by lenders to a business that has high profits for periods, followed by sharp drops in profit.

Although the business strategy cannot be altered purely for the purposes of borrowing, the issue of stability and steady growth may have a general input to the development of the business, in the context of future borrowing.

For example, taking steps to reduce the volatility of cash flow may reduce working capital requirements, improve the stability of the business, and make raising debt easier.

A stable cash flow over a period of time may allow the business to carry a significant debt burden, without a major risk of insolvency developing.

Methods to smooth cash flow, such as payments in instalments and operating several different activities, may improve the business's general financial position and also make borrowing easier.

4.2.2.5.3.4. Capital strength

The capital strength of the business involves the amount of equity funds retained within the business, in proportion to the level of debt and cash flow.

Operating margins may also be relevant in assessing the risk of a default occurring on a loan due to deteriorating conditions.

A business in a strong capital position may not suffer serious problems in the short term if margins shrank, sales declined, income payments were not received, or unexpected expenses arose.

The capital strength of a business can be improved using some of the following approaches:

- Retaining profits within the business rather than paying dividends.
- Using short credit terms with customers.
- Leasing equipment and facilities rather than spending equity funds.
- Avoiding excessive capital expenditure on new facilities and projects
- Transferring personal assets into the business. This is known as "capitalising the company".

4.2.2.5.4. Debt capacity

Debt capacity is the level of debt that can be supported by the business operations.

This is primarily a cash flow issue, rather than a profitability issue.

Debt capacity can be measured using the "interest cover" ratio, which is the ratio of gross cash flow to the interest expense.

For example, an interest cover ratio of three times would indicate that the gross cash flow was three times larger than the interest payments.

The debt capacity of a business is highly dependant on the stability of the cash flows.

High gearing levels are used with stable and predictable cash flows, such as property and infrastructure investment.

For example, residential property loans often have loan-to-valuation ratios of up to 90%, indicating that nine dollars is borrowed for every dollar that is invested.

Debt capacity can be improved by taking steps to reduce the volatility of cash flow, and ensuring that the business develops along a continuous path, rather than conducting random transactions.

4.2.2.5.5. Debt structures

Debt involves making a series of payments.

These payments can be structured in a wide variety of different ways.

In most cases, a single payment is made from the lender to the borrower at the beginning of the loan term, and then a series of payments is made from the borrower to the lender.

More complex arrangements may apply in situations such as project financing, which may involve several payments in each direction at different points during the project.

4.2.2.5.5.1. Principal & Interest vs. Structured Cash Flows

Debt structures can be viewed in two ways.

The “principal & interest” view involves the loan having an outstanding balance.

Interest payments are based on the loan balance outstanding at a particular point in time.

Depending on whether the payments made are less than, equal to, or greater than the interest amount, the loan balance may increase, stay level, or reduce during the term of the loan.

The final loan payment involves the payment of the outstanding balance, if any.

The alternative view does involve a concept of a “loan balance” or “outstanding principal” amount, and does not consider principal and interest as separate payments.

Under this view, the loan structure consists of a series of inflows and outflows of different sizes at different points in time.

The “internal rate of return” calculation can be used to determine the effective interest rate of the loan structure.

This is the interest rate than sets the present value of all inflows and outflows to zero.

The cash flow approach is generally used in complex debt structures and financial markets transactions, while the principal-and-interest approach is useful for reviewing business lending.

Each view is simply a different perspective on the same set of payments, and there is no difference in amounts depending on which view is used to interpret the payments.

For example, the principal-and-interest perspective is useful for reviewing the amount than would be needed to terminate a loan mid-way through the loan term, while the cash-flow approach is useful for determining the effective interest rate of a set of payments.

4.2.2.5.5.2. Bonds

Most bonds issued by corporations and governments follow a similar payment structure.

This involves regular interest payments, usually half-yearly, with the principal being repaid in a lump sum at the end of the period.

Terms usually range from 3 to 10 years for corporate bonds, and up to 20 years for government bonds.

This structure is also available for bank loans, in which case it is known as an “interest-only loan”.

This is a simple structure than has several advantages.

Interest payments are clearly separated from principal payments.

Payments during the term of the bond are lower than the payments on an amortising loan, which reduces the drain on cash flow.

Also, many business transactions are fundamentally based on individual lump-sum payments.

For example, money may be raised to fund a development project, the project may be completed, and then the finished project may be sold and the loan may be repaid.

In circumstances such as these, the repayment of the principal in a lump sum matches the sale of the finished project.

This is in contrast to personal situations, which usually operate on a continuous basis, rather than a lump-sum basis.

Businesses usually carry a stable level of debt for extended periods of time.

Interest payments are made on a regular basis.

In the case of bank lending, principal amounts may be rolled-over on loan maturity dates.

With bonds issued to investors, new bonds are generally issued to ensure that the total debt level remains reasonable stable.

This applies due to the fact that the assets, including the business operations and equipment that is regularly replaced, also remain at a stable level.

In contrast, personal lending often involves assets that reduce in value, or in the case of property, effectively includes a savings scheme as well as interest payments, so that the value of the property is accumulated as the loan is repaid.

4.2.2.5.5.3. Discount securities

Discount securities are issued by large companies and governments.

These are short-term borrowings, with terms typically being 30, 60, 90 or 180 days.

No interest is paid during the term of these transactions.

An amount is borrowed at the beginning of the period, and then a larger amount is repaid at the end of the period, to include the interest component.

The term "discount" comes from the fact that the final value, not the initial value, is usually a fixed amount, with the initial value being a discount to the face value.

For example, a short-term bill may be issued with a face value of $10, and an initial value of $9.8735.

"Bank bills" are short-term bills issued by companies that have been endorsed by a bank.

If the company defaults on the payment, the payment is made by the bank.

A fee is charged by the bank for providing this guarantee, and the security itself has the equivalent security of a bank deposit with that bank.

These bills are used for credit in trades between medium-sized and large companies.

The bank bill market is often used by companies and investment funds for investing cash holdings, rather than depositing the holdings within bank accounts.

4.2.2.5.5.4. Amortising loans

An amortising loan structure involves a series of regular payments, with the principal of the loan being reduced to zero at the end of the loan term.

Most personal lending is based on amortising loans.

Amortising loans have higher repayments than interest-only loans, however there is no need to repay the principal in a lump sum at the end of the loan term.

In an amortising loan, the payments are a fixed amount through the term of the loan.

The principal of an amortising loan does not reduce in a straight line.

Early payments mainly cover interest, with the principal declining slowly, while later repayments have a small interest component, with the principal falling rapidly towards the end of the loan.

In the business context, amortising loans could be useful for purchasing equipment.

Equipment leases generally have an amortising payment structure.

The equipment declines in value over a period of time.

If the term of the loan is approximately equal to the life span of the equipment, then the decline in the loan balance will occur at a similar rate to the decline in the value of the equipment.

At the end of the loan term, both the loan and the equipment will have a zero value.

This may be a safer arrangement than an interest-only approach, as in this case the risk arises of the assets declining to zero, leaving a large amount of debt, but no assets or cash flow to support the loan.

The following graph illustrates the decline in the balance of an amortising loan through the term of the loan.

In the case of straight-line depreciation, or a market value that reduces in a straight line, the asset value and the net value of the asset and the debt is also shown.

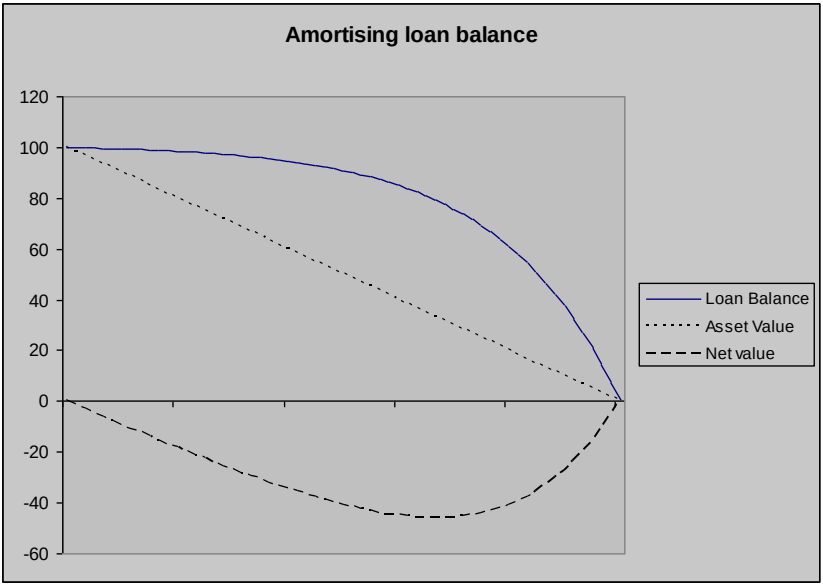


Table 2

4.2.2.5.5.5. Floating balances

Floating debt balances occur in overdrafts and other at-call credit facilities.

In these cases, the business can withdraw and deposit payments at will.

The level of outstanding principal may rise and fall over time, with the interest being calculated on the level of principal owing at each point in time.

Floating credits facilities may be useful for managing variations in cash flow, where payments may be required before income is received, and as stand-by facilities in case of unexpected expenses or cash flow problems developing.

Overdrafts attached to business cheque accounts are a widely used for managing cash flow.

4.2.2.5.5.6. Capitalised interest

Capitalisation of interest occurs when repayments are not made during the term of a medium-tern or long-term loan.

In these cases, interest is calculated on a regular basis, and added to the principal amount.

The principal grows during the term of the loan, and interest costs also increase as the interest is calculated on a higher principal amount.

The outstanding principal amount is then repaid at the end of the loan term.

This is clearly a higher-risk approach than structures such as amortising loans, both for the lender and borrower.

With capitalised interest, the amount owing increases during the loan term.

Also, regular payments are not made.

In the case of a bond, for example, regular payments of interest are made.

This is generally based on the regular cash from the business operations.

This structure ensures that, at a minimum, the business has the capacity to meet on-going interest payments.

However, with capitalised interest, the risk arises that the business will never have the cash flow to pay even the on-going interest costs, let alone repay the principal.

However, capitalisation of interest is a useful structure in a number of circumstances.

This generally applies when no income is received during the term of the loan.

For example, debt may be raised to fund a development project.

The money raised would then be used to pay the expenses of the development.

Interest on the debt may be capitalised, and the loan would be repaid at the end of the term when the finished project was sold.

Paying interest during the loan term would be pointless in this case, as this would simply involve paying back funds to the lender that were borrowed at the start of the project.

If this was done, a larger amount would have to be borrowed at the beginning of the project, to cover the interest payments that would be due during the term of the project.

This situation would also increase total interest costs, as interest would need to be paid on the money that was borrowed to meet the interest payments themselves.

Capitalising interest is also used during the start-up phase of new business operations, such as when a business owner provides a loan to the business as well as investing equity funds.

4.2.2.5.6. Debt calculations

Financial calculations are discussed in detail in the section beginning on page 734.

Some specific examples relating to debt calculations are listed below.

4.2.2.5.6.1. Interest

Interest is calculated by multiplying the principal amount by the interest rate.

The following formula can be used to calculate the interest that is due for a period of time

$$\text{interest} = \text{principal} \times \frac{\text{interest rate}}{100} \times \frac{\text{number of days}}{365}$$

In the case of monthly interest, the number of months will give a close result to the exact figure, rather than using actual days.

For example, the interest payment due on a bond with a face value of $50, an interest rate of 8%, and a six-monthly payment could be calculated using the following example

$$\text{interest} = 50 \times \frac{8}{100} \times \frac{6}{12}$$

$$= 2$$

4.2.2.5.6.2. Amortising loan repayments

The repayments on an amortising loan can be calculated using the following formula.

This formula is a re-arrangement of the standard annuity formula for the present value of a series of regular cash flows, with the present value set to equal the loan amount.

$$\text{payment} = \text{principal} \times \frac{y}{1 - (1 + y)^{-n}}$$

In this formula, the variables have the following meaning

n	The number of periods. This is the number of years in the loan multiplied by 12 if monthly calculations are made.
y	The interest rate per period, in decimal format. For monthly calculations, this is the annual percentage rate divided by 1200.
principal	The amount of the loan

The operation of raising one number to the power of another number is known as exponentiation.

This function may be represented in the form y^x, available on calculators that include scientific or financial functions.

Within computer software such spreadsheet programs, the carat symbol "^" or some other symbol or function may be used to calculate the value of one number raised to another number.

A table of loan repayments for various terms and interest rates is presented in appendix E.

For example, with a loan of $100 over a five year period, with an annual interest rate of 8%, the following calculation would apply.

$$n = 5 \times 12 = 60$$

$$y = \frac{8}{1200} = 0.006667$$

$$\text{payment} = 100 \times \frac{0.006667}{1 - (1 + 0.006667)^{-60}}$$

$$= 100 \times \frac{0.006667}{1 - (1.006667)^{-60}}$$

$$= 100 \times \frac{0.006667}{1 - 0.671197}$$

$$= 100 \times \frac{0.006667}{0.328803}$$

$$= 100 \times 0.020277$$

$$= 2.03$$

4.2.2.5.6.3. Embedded interest rates

In some cases, the payments will be known, however the interest rate may not be known.

For example, a product may be offered for sale through a series of instalments.

The interest rate that is included within the instalments may be specified in the sale contract, however if this is not the case, then the interest rate can be determined using the following approach.

First, the equivalent value as a single payment must be known.

This could be based on a separate price offered for a single-payment purchase, or an estimate of the value based on the prices of similar items.

The calculation uses the same annuity formula as before.

This is re-arranged into the following form

$$\text{payment} \times \frac{1-(1+y)^{-n}}{y} - \text{principal} = 0$$

This formula cannot be calculated directly, and a trial-and-error approach, or a computer program such as a spreadsheet, must be used to determine the value of "y" that results in the equation being equal to zero.

This is also known as the "internal rate of return" of the series of cash flows.

4.2.2.5.6.4. Sinking funds

A "sinking fund" is a fund in which regular payments are put aside to reach a specific figure on a future date.

This approach is sometimes used to put aside funds to pay for the replacement of an item of equipment, for example.

In some cases a sinking fund may represent an actual bank account or other fund holding, however in most cases this is an accounting entry in the general liabilities of the business.

The payment required for a sinking fund can be determined using a standard formula, which calculates the future value of a series of regular payments.

This formula is usually known as the future value of an annuity.

The formula assumes that each payment accumulates interest from the time that it is made.

For example, this approach will calculate the final balance of a bank account, where regular contributions are made into the account.

The first stage in this process is to calculate the future value than needs to be accumulated.

This would often be an existing value, increased to allow for inflation.

The future value of a single value on the current date can be calculated using the following formula.

$$\text{future value} = \text{amount} \times \left(1 + \frac{\text{interest rate}}{100}\right)^{n}$$

In this formula, the following variables apply.

n	The number of periods, such as the number of years
interest rate	The interest rate per period, in percentage format

For example, a machine with a value of $100 may have a life span of five years of operation.

A sinking fund may be created to allocate funds to replace the equipment at the end of the five year period.

Assuming an inflation rate of 4%, the value at that time could be calculated using the example below.

$$\text{future value} = 100 \times \left(1 + \frac{4}{100}\right)^{5}$$

$$= 122$$

The payments could then be calculated using the following formula

$$\text{payment} = \text{future value} \times \frac{y}{(1+y)^n - 1}$$

In this formula, the variables have the following meaning.

y	The interest rate per period. This is the annual rate divided by 1200, if monthly calculations are used
n	The number of periods. This is the number of months, if monthly calculations are used.

Assuming an interest rate of 8%, the following calculation would apply.

$$n = 5 \times 12 = 60$$

$$y = \frac{8}{1200} = 0.006667$$

$$\text{payment} = 122 \times \frac{0.006667}{(1 + 0.006667)^{60} - 1}$$

$$= 1.66$$

4.2.2.5.7. Debt management

Debt management involves arranging loans and organising bond issues, managing the balance of fixed and floating interest rates, managing the rollover of debt and other debt-related issues.

4.2.2.5.7.1. Fixed & floating interest rates

The interest rate on debt is generally a fixed rate for the term of the loan, or a floating rate that varies on a regular basis.

Most bonds issued by companies are fixed-rate debt.

Bank loans can be either fixed-rate or floating-rate.

Facilities with floating balances, such as overdrafts, generally also have floating interest rates.

Floating interest rates have the advantage of allowing the company to restructure the assets and debts of the business as interest rates rise and fall.

This also avoids the risk that the business may be locked into a long period of payments on fixed-rate debts at high interest rates.

However, interest rates can be highly volatile.

Short-term spikes in interest rates occur when rates rise sharply for a period of several months, or in some cases several years.

This can lead to cash flow problems for the business as large interest payments are due on floating-rate debt.

4.2.2.5.7.2. Managing interest rate risk

Corporate treasuries use a number of methods to manage interest rate risks.

This includes maintaining a mix of fixed-rate and floating rate debt, with bonds issued with various different terms.

Futures contracts can be used to lock in interest rates of lending or borrowing on future dates, and can also be traded to hedge capital gains or losses in debt portfolios.

Other financial markets instruments, including options and “swaps” are also used.

A swap is a contract that involves one party exchanging a series of fixed-rate interest payments for a series of floating rate interest payments from the other party.

The net different in payments is exchanged on each interest payment date.

For example, a company that issued a large amount of five-year fixed-rate bonds could enter a swap transaction with another party, to pay the fixed interest payments to the other party, and receive floating interest payments in return.

This would allow the company to issue fixed-rate securities, and adjust the interest rate exposure to be partially exposed to floating rates.

4.2.2.5.7.3. Small enterprises

Interest rate risk management within smaller enterprises may involve choosing between fixed-rate and floating-rate loans.

Floating rate debt exposes the business to the risk of a sharp rise in interest rates, and cash flow problems due to interest payments.

However, long term fixed rates may leave the business locked into paying high rates for an extended period of time.

When this occurs, a fixed term loan can sometimes be cancelled before the term expires.

However, this would lead to a capital loss for the bank, which would loose the future interest stream, and a large termination penalty may apply, calculated from the difference in interest rates over the period.

Alternatively, if interest rates rise, the business would benefit from being locked into a long term loan at a low interest rate.

Fixed loan terms in the range of 3 to 5 years would avoid some of the problems with floating-rate or long-term fixed-rate debt.

Medium term rates are less volatile than floating rates, and do not rise or fall as much as floating rates when rates move.

This may reduce the risk of a cash flow problems developing over a short period of very high interest rates.

Also, this would avoid the possibility of being locked into a fixed rate for a long period of time when the general level of interest rates had fallen.

4.2.2.5.7.4. Average interest rates

The interest rate paid on the business's debt can have a significant impact on the profitability of a business.

For example, a business may be largely debt-funded, with returns from operations being 10% of assets, and debt interest rates being 8%.

In this case, the net profit would be 2% of assets.

However, if the interest rate rose from 8% to 9%, the net profit would fall by one-half to 1% of assets.

The average interest rate is the average rate paid across all the business's debt facilities.

This can be calculated using either of the following approaches:

$$\text{average rate} = \frac{\text{sum of "principal} \times \text{interest rate" for each loan}}{\text{total principal}}$$

For example, if a business had a loan of $100 with an interest rate of 8% and a loan of $50 with an interest rate of 7%, the average interest rate could be calculated using the following example

$$\text{average rate} = \frac{100 \times 8 + 50 \times 7}{100 + 50}$$

$$= 7.67\ \%$$

This formula is known as a "weighted average".

This is widely used in business and finance, and can be used in any situation where the average of a set of numbers needs to be calculated, but each number has a different size or significance within the total.

Alternatively, the average rate could be calculated from the following formula:

$$\text{average rate} = \frac{\text{interest expense}}{\text{debt}}$$

This second approach could be used to calculate the average interest rate from a set of financial statements.

However, the result may not be accurate if there was a large change in the debt level during the period.

Also, this approach can only be used to calculate the historical average rate on a previous set of interest payments.

4.2.2.5.7.5. Reducing debt interest rates

The interest rate that is charged on a loan is composed of two parts.

The first part is a base interest rate, which is the general level of interest rates within the economy.

The second amount is known as a "risk premium", and is based on the risk that a default will occur and that the loan will not be repaid.

In some circumstances, interest rates may be reduced by taking steps to reduce the risk of the loan from the lender's perspective.

These may include:

- Offering collateral, such as a property for a mortgage.
- Strengthening the financial position of the company.
- Developing a stable trading history of operations.

Also, in some cases different lenders may charge significantly different interest rates.

In these cases it may be worthwhile spending time locating the lender that charges the lowest rate of interest, as interest payments are often a large expense for a business, and differences can be significant.

Unlike purchasing goods or services, or depositing funds, there is no difference to the business in the source of the loan funds, apart from the interest rate.

However, some lenders charge higher interest rates due to the fact that they engage in higher-risk loans, such as unsecured loans.

In these cases, loans may be rejected by lenders offering lower rates, but may be accepted by lenders operating in a higher-risk part of the loan market.

4.2.2.5.7.6. Loan Rollovers

Loan rollovers occur when the term of a loan has expired, and the principal is due for repayment.

Business operates on a continuous basis, and it is common to roll-over a loan for a further period.

For example, a 3 year interest-only loan may be taken out to fund the expansion of the business.

At the end of the 3 years, the principal would be due for repayment.

The business may then wish to re-draw the loan on similar terms for another 3 years.

This would involve the bank adjusting the interest rate to the current 3-year fixed rate, and interest payments would continue as before.

However, loan rollovers are at the discretion of the bank.

If the business's financial condition had deteriorated, the bank may refuse a rollover request, and request repayment of the principal on the due date.

The risk of this problem occurring can be reduced by arranging several different loans than expire on different dates.

This is known as a "staggered rollover".

In general it would not be practical for a business to have its entire debt level expiring on a single day.

For example, three separate three-year loans could be maintained, with one loan expiring in each year.

This would reduce interest rate risk and also reduce rollover risk, with the chance of large payments being required.

In practice, most businesses have a mix or different debt facilities, with various terms, amounts and interest rates.

4.2.2.5.8. Other debt issues

4.2.2.5.8.1. Debt covenants

In the case of medium sized and large businesses, it is common to include debt covenants within the loan agreement.

This may be included in a prospectus that is issued to the public, or a bank loan agreement.

A debt covenant is a condition that the business agrees to abide by, as part of the loan agreement.

Some common debt covenants would include conditions such as the following:

- That the business will not increase the debt-to-equity ratio above a specified limit.
- That the business will maintain a minimum level of liquid assets.

Breaching a debt covenant is a breach of the contract of the loan, and is equivalent to the business failing to make a debt payment when it is due.

In practice, debt covenants are often the first item to be breached when a business enters a condition of financial distress, and this may trigger a bank to become involved in planning a financial restructure of the business to restore solvency.

A “negative pledge” is an agreement to not perform a certain action.

A common negative pledge condition would be that the business does not offer a specified asset as security to any other lender, so that the asset would be available for the general distribution of funds in the event of a liquidation.

4.2.3. Subordinated debt

In some business structures, a main parent company may own several subsidiary companies.

Each subsidiary company would have a separate business operation and financial structure.

In these cases, is it common for one company within the corporate group to supply a loan to another company, to act as a buffer of shareholder's funds.

This is often done on the basis of "subordinated debt".

Subordinated debt is debt that ranks behind other debt in the event of an insolvency.

When a liquidation occurs, ordinary debt is repaid before subordinated debt.

This is done to avoid a situation where external lenders decline to lend to the company, because the company already had debt that may absorb some of the assets if insolvency occurred.

4.2.3.1.1.1. Limited recourse debt

"limited recourse" debt applies to debt where the lender has access to specific cash flows or asset backing, rather than the general capacities of the business.

This type of financing is sometimes used in mining projects, for example.

In these cases, limited recourse debt is raised to fund a mine development.

The lender then has access to the cash flows from the mine operation, to service the interest costs and capital repayments of the debt.

The lender does not have access to the general cash flow of the business.

As a separate example, a lease over an asset may effectively be a limited recourse arrangement.

In these circumstances, in the case of a liquidation of the business, the asset is sold, and if there are insufficient funds raised to repay the lease debt, the remaining debt is written off, and the lender may not have access to the general distribution of assets.

Limited recourse debt may reduce the cash flow drain on a company during the start-up phase of a project.

This arrangement may also increase the debt capacity of the business and reduce risk, by separating certain debt from the company's financial resources and restricting the debt exposure to specific assets.

4.2.3.1.1.2. Liquidation

In the event of the liquidation of a business, all assets are sold.

Secured debt is debt that is secured against a specific asset.

The sale of each secured asset is used to repay that particular debt.

If there are not enough funds raised from the sale to repay the entire debt, then the remaining unpaid debt becomes part of the general unsecured pool of debt.

If the asset sale raises more than the amount of the debt, then the debt is repaid in full, and the remaining amount is added to the pool of assets for general distribution.

After this process has been completed, the available assets are distributed among the pool of unsecured debts on a pro-rata basis.

For example, there may be sufficient funds raised from the asset sales to repay 80% of each debt that is outstanding.

If all debts are repaid in full, then any funds remaining are distributed to the shareholders, at a fixed amount per share.

4.2.3.1.2. The debt raising process

Raising debt is generally done through bank loans, or by issuing bonds to the public.

In the case of personal lending, loan applications are submitted to banks for bank loans.

In the case of business loans, the process would generally involve discussions between a contact at a bank and the business.

This may then be followed by the business submitting information such as recent accounts and trading information, with the bank then either accepting or rejecting the loan.

A similar process occurs with large corporate loans, although in this case an extended period of time may be involved.

Large loans may involve detailed contracts, including a range of debt convents and restrictions, such as requirements to maintain the debt-to-equity ratio below a certain limit, or minimum requirements for liquid funds.

In the case of bonds, a prospectus is prepared with a set of audited accounts and a review of business operations.

The prospectus is then issued to the public.

Funds are then subscribed for bonds by investors.

In some cases, the bonds are listed for trading on a stock exchange, and can be bought and sold before the fund expires.

Trading in bonds is not a liquid activity on many stock exchanges.

While the value and outlook of shares may change daily, the value of bonds only changes when a significant change in interest rates occurs, or a significant risk of insolvency arises within a company.

For these reasons, holds are often held for extended periods of time rather than being regularly traded, and trading of physical bonds may be a small part of stock exchange turnover.

4.2.3.1.3. Debt terms

Amortising loan	A loan structure where the payments are higher than the interest level, leading to the principal reducing to zero at the end of the loan term. Equipment leasing and most personal lending is based on amortising loan structures.
Bearer bond	A bond in which the name of the bond holder is not recorded by the company, and physical possession of the bond certificate is used as proof of ownership of the bond.
Bill	A short-term loan issued by a company, and usually tradable with other investors
Bond	A loan structure issued by corporations and governments, with regular interest payments and the principal repaid at the end of the loan term.
Borrower	A party who borrows money from another party, and pays interest in return, along with repayment of the principal according to a loan schedule.
Capitalised interest	Interest that is added to the loan balance, rather than being paid at the current time.
Coupon	An interest payment on a bond. The coupon rate is the interest rate, and a coupon payment is an interest payment. This term appeared with bonds in the distant past, which had paper coupons attached for each interest payment.
Credit	Borrowed funds.
Credit risk	The risk of default on a loan arrangement, where part or all of the loan amount may not be recovered.
Creditor	A party that the business owes money to. This is generally a lender, such as a bank or the investors in a bond issue, however it could included parties that the business owed money to for products received or services performed.
Debt covenant	A condition included in a loan agreement or prospectus, such as a condition that the business will not allow the debt-to-equity

	ratio to rise above 50%.
Debt issue	The issue of a prospectus and accepting funds as part of an issue of bonds. The prospectus would specify the terms of the bond, such as a 8% annual coupon rate paid six-monthly, with principal repaid at the end of a five-year period. Debt issues are usually for a specified maximum amount of funds.
Debtor	A party that owes money to the business.
Debt-to-equity ratio	The ratio of debt to equity, used to asses the level of debt within a business.
Default	Failing to make a payment under a loan agreement on the due date. When a default condition occurs, a creditor can take action such as selling a secured asset, or filing an application in a court to have the business liquidated.
Discount security	A loan that is conducted with two cash flows, an initial inflow, and a repayment of the face value at maturity. The final payment is usually a round figure, with the initial payment calculated as a discount to the face value, based on an interest rate and the number of days.
Face value	The amount of principal repayment due at the end of the loan term.
Finance Lease	A lease of an item of equipment, where an asset and liability are recorded on the balance sheet.
Gearing	The level of debt compared to the level of equity investment. This is commonly calculated using the percentage of debt to total assets. Alternatives include the debt-to-equity ratio, and a multiple, such as gearing of three times, with three dollars borrowed for each dollar invested.
Inscribed stock	A bond in which the name of the bond holder is recorded by the company, in contrast to a “bearer bond”.
Interest	Payment to a lender in exchange for borrowing funds.
Interest rate	The percentage used to calculate the interest payment, compared to the loan amount.
Lease	A loan used to buy an item of equipment,

	with the equipment being used as security for the loan. This is known as "off-balance-sheet debt", as the loan itself is generally not recorded on the balance sheet, only the interest payments are recorded. This is a similar arranging to hiring equipment, and involves a regular payment, rather than recording an asset and a debt on the balance sheet.
Lender	A party that loans money to a business in return for interest payments, and the repayment of principal according to a defined schedule. Also referred to as an investor in the case of subscribing to bond issues.
Loan-to-valuation ratio	A banking term that is equivalent to a gearing ratio, this is the size of the loan as a percentage of the collateral asset value.
Maturity	The date that a loan arrangement terminates.
Negative pledge	A condition in a loan contract that specifies that an action should not be taken, such as offering an asset to another lender as security.
Note	A short-term loan, often issued by a government, and tradable with other investors.
Off-balance-sheet debt	An arrangement that includes debt within the structure, and is not recorded as separate debt and asset amounts on the balance sheet. Examples include operating leases, and some structures such as joint venture arrangements.
Operating Lease	A lease in which the lease payment is recorded as an expense, and no record is made on the balance sheet. This is similar to hiring equipment on a short-term basis, or renting a property.
Prospectus	A detailed document that includes a full set of audited accounts, a review of the business, and specifies the interest and principal payment terms. Prospectuses are used for both equity and debt raisings from the general public.
Risk premium	An amount added to a base interest rate to compensate for the risk of default on a loan.

Rollover	To continue a loan for a further period at the expiry of the initial loan. For example, a 3-year loan may be continued for another 3-years at the new 3-year interest rate.
Semi-annual	Six-monthly. Most bonds are semi-annual and pay interest twice a year.
Staggered rollover	Rolling-over a large loan balance in several parts on different dates to reduce interest rate risk and the risk of large outflows if rollover requests are declined.
Subordinated debt	A loan that ranks below other debt in the event of a liquidation. This loan is usually supplied by an associated company.
Subscribe	To complete an application form in a prospectus and send a cheque, as part of a bond issue. This would result in the investor receiving interest payments and principal repayments in accordance with the terms of the debt issue.
Term	The period of time that the loan arrangement operates for.

4.2.3.2. Equity

Equity is name that is given to the net funds held within a business.

This is equal to the total assets held in the business, less the debts that are owed.

The same concepts and issues apply whether a sole trader, partnership or company structure is used.

However, the company structure is the clearest structure, and the terms used for companies are useful in illustrating the structure of equity.

4.2.3.2.1. Sources of equity

Equity can accumulate within the business due to retained profits from previous years.

Also, equity can be contributed directly by shareholders.

This may be additional funds transferred into the business from the existing shareholders, or it could be funds raised from new investors.

In either case, the ownership of the business after the equity raising is split in proportion to the amount of shares held by each investor.

In turn, this is equal to the amount of money invested in the business, or the number of shares purchases from other parties.

4.2.3.2.2. Uses of equity

Additional equity is raised in some of the following circumstances:

- To fund a purchase of another business.
- To fund a major expansion or capital expenditure program.
- To stabilise the position of the company if the company enters a condition of financial difficulty, such as high debt levels and loss-making operations.

4.2.3.2.3. Raising equity

Public companies are large businesses with shares that are generally listed on a stock exchange.

These shares are bought and sold by the general public.

Other business structures, including private companies, sole traders and partnerships, involve a small number of business owners, generally having personal involvement in managing the business.

Raising equity is distinctly different in public companies from private business structures.

The regulations for raising debt and equity from the general public are controlled by the commercial law.

This specifies a detailed set of conditions and procedures, which may include the type of information that should be included in a prospectus, together with the timing of various stages in the process.

4.2.3.2.3.1. Public companies

In the case of public companies, a prospectus or public announcement is issued, and investors subscribe cash in return for newly-issued shares.

This increases the cash holdings within the company.

Raising equity in this situation has little effect on the control of the company.

Both before and after the equity raising, the shares are generally spread across a large number of individual investors.

The ability of a listed company to raise equity depends on the financial condition of the business, and the general economic environment.

Generally equity can be raised unless the company is at serious risk of insolvency in the short or medium term.

Raising equity to stabilise the financial condition of a company that has high debt levels or is experiencing poor operating conditions is a common occurrence.

The newly-issued shares may be offered at a discount to the current market price, to attract interest from investors.

This dilutes the existing shareholdings, unless the shareholder subscribes for the full set of rights that are allocated according to their number of shares.

The ability to raise equity is heavily dependant on the current economic environment.

Raising equity may be difficult or impossible during periods of economic recession, or periods of negative stock market returns.

At these times, there may not be sufficient interest from investors to be able to raise additional funds.

4.2.3.2.3.2. Private business structures

In the case of private business structures, a different situation applies.

In these cases, either funds must be contributed from the existing business owners, or new investors must be personally located.

In the second case, the new investors will own a share of the business in proportion to the funds that they have invested, and control of the business may be determined by the combined decisions of the complete group of business owners.

Involving new parties in the ownership and control of the business is a major step, and this is usually not done unless a major change in the structure and operations of the business is intended.

Equity investment may sometimes be available from investors who wish to make a passive financial investment, rather than becoming part of the operation of the business itself.

This still involves giving up partial ownership of the business, however it may result in the existing business owners continuing to control the management and development of the business.

This arrangement may be preferable to bringing in new partners to the business operation, as this step often leads to the break-up or closure of the business in the long term.

Passive investment equity funds may be available from individuals in some cases.

This can be sourced through advertisements inviting contact from professional investors, through business brokers, and through word-of-mouth contact.

A business cannot advertise to raise equity from the general public without converting the business to a public company and issuing a prospectus.

This is an expensive and complex process that is usually only done once the business reaches a significant size.

Private equity investment may also be sourced from “venture capital” funds.

Venture capital funds are funds that specialise in making direct equity investments in small and medium sized businesses.

For example, this may involve a business that was already operating with stable operations, but was in a position to raise funds to fund a major expansion.

4.2.3.2.4. Reducing Equity

4.2.3.2.4.1. Dividends

Dividends are distributions of the equity capital to investors.

Companies often pay dividends twice-yearly, with the dividend level set to be a proportion of the average profit.

Different businesses have different dividend policies, ranging from no dividends, to paying out the full profit as dividend payments.

In the majority of cases, part of the profit is distributed as dividends, while part is retained to fund replacement of facilities and expansion programs.

4.2.3.2.4.2. Capital distributions

Capital distributions occur when a large amount of equity capital is distributed to shareholders.

This is similar to a large dividend payment, however a capital distribution involves a significant reduction in capital, rather than paying out recent profits.

This may be done in circumstances in which a large amount of equity capital has accumulated within the company.

This may arise in situations where the company has had an extended period of successful operation, and in situations such as when a major business unit has been sold.

4.2.3.2.4.3. Buybacks

A buyback of shares or an interest in a partnership occurs as a method of an investor withdrawing from the business operation.

Public companies often take this approach as a method of reducing equity capital, as an alternative to a capital distribution.

In a buyback, funds from within the business are used to buy the shares or partnership interest from the investor.

The shares are then cancelled.

This allows the investor to sell their shares, and the business reduces in size by the amount of the withdrawn investment.

The process has the effect of the shareholder withdrawing their share of the business value in the form of cash.

This approach is used by private companies for two reasons.

First, in some cases another investor may not be available to buy the shares of the investor who wishes to exit.

A buyback allows an investor to withdraw their funds and exit the business.

A second reason is that the business may wish to reduce the size of the operation, rather than have another investor take over the shares of the previous holder.

For example, in the case of a partner withdrawing from a partnership, the remaining partners may wish to reduce the size of the partnership, rather than having a new partner come in.

4.2.3.2.5. The equity raising process

Raising equity in a private operation involves locating a party who wishes to invest in the business.

Once this is done, the investor's funds are transferred into the business accounts, and shares are issued or a partnership interest is recognised.

When a business is first floated, it is converted to a public company.

This involves preparing a prospectus, usually with the aid of an investment bank or stockbroking firm, who manages the float process.

The prospectus contains a full set of audited accounts, and a written description and review of the business.

The prospectus is then issued to the public, funds for shares are received, and some time later the shares are listed for trading on a stock exchange.

The original business owners often retain a large portion of the shares, and sell the remainder through the float.

In the case of companies that are already listed, raising equity is done by a "rights issue".

This generally involves the existing shareholders being offered the right to purchase additional shares, in proportion to their current shareholding.

In some cases, these rights are listed and can be sold on the exchange, in which case other investors can buy the rights and subscribe for the shares.

4.2.3.2.6. Other equity issues

4.2.3.2.6.1. Negative equity

A business can have negative equity.

This occurs when the value of the debt is greater than the value of the assets.

Negative equity does not imply that a business is insolvent.

A business can continue operating as long as it has sufficient cash to make payments as they become due.

A business with negative equity may have positive cash flow or negative cash flow.

However, negative equity generally implies that the business is in serious financial trouble.

This situation could be corrected by raising additional equity to restore the balance sheet.

Alternatively, an improvement in trading conditions may see cash flow into the business and asset values rise, which could return the business to a stable financial position.

Negative equity occurs with businesses experiencing poor operating conditions, start-up enterprises where large expenses are incurred, and in the development phase of projects.

4.2.3.2.6.2. Dilution

In cases where new shares are issued at the same value as the current market price, the equity issue does not directly affect the value of the existing shares.

This step simply results in the company becoming a larger enterprise.

The original shares will have the same value, although they would represent a smaller proportion of the expanded company.

However, a share issue conducted in this way may attract little interest, as shares could already be bought through the stock exchange at the current price, regardless of the equity issue.

For this reason, equity issues are generally priced at a small discount to the current market value, to attract investor interest.

This process results in a reduction in the value of the existing shares, and a transfer from the previous shares to the newly-issued shares.

This effect is known as “dilution”.

Dilution can be avoided if the shareholder subscribes for the full set of new shares that is related to their current shareholding, or sells the rights through the stock exchange.

In cases where the share price is trading at the same level as the net assets per share, and the share issue is not conducted at a discount, the net assets per share of the original shares do not change following the issue.

However, in the case of a share price that is trading above the net assets per share, a share issue would increase the net asset backing for each share.

This is balanced against the fact that the newly-raised equity is generally in the form of cash, and may not result in an increase in operating income in the short term.

On balance the shares may rise or fall following an equity issue, depending on the plans and structure of the new operation, although the raising of equity is a pro-active step and may lead to an improved outlook for the business.

4.2.4. Capital Reconstructions

A capital reconstruction occurs when a change is made in the way that the shares are arranged within the company’s capital base.

This may occur in conjunction with an equity raising or capital distribution, or it may simply involve a change in the number of shares.

A share split is a common form of capital reconstruction.

In a 1 for 10 share spit, for example, each share is split into 10 new shares.

Each of the new shares would then be worth one-tenth of the value of the old shares.

Share splits and share consolidations do not have any affect on the company, or on the value of the share holdings.

However, capital reconstructions of this type are done for several reasons.

From a practical perspective, each individual share needs to be priced within a certain price range.

If a single share has a large value, then investors wishing to purchase a small value shareholding, or to sell a small part of their holding, would not be able to do so.

If the share price is too low, a gap of a single cent may become a significant jump between the price of a bid and the price of an offer.

In practice, most share prices are between 20 cents and 20 dollars per share.

A practical minimum shareholding, allowing for minimum brokerage costs, would be in the region of a few thousand dollars.

When the share price moves far outside this price range, companies will often arrange a share split or a share consolidation to reset the share price to within a practical range.

One school of thought holds that trading volume in a company's shares will increase when a large number of lower-value shares are used, however a number of statistical studies have failed to find any evidence of this effect.

The price of a single share is an irrelevant figure as far as value is concerned.

For example, a holding of 10 shares worth $5 each has the same value as a holding of 2 shares worth $25 each.

The fact than one share price is $5 and the other is $25 does not allow any comparison to be made between the two.

For example, two companies could be identical, but if one company had a total of 100 shares on issue while the other had 200 shares, then the price of the second company's shares would be half the price of the first company's shares.

However, high share prices are usually the result of a long period of growth, and on average a share worth 65c is often associated with a small company or a company that has experienced a large fall in its share price, while a share

price of $40 would more often be associated with a large blue-chip company with a secure balance sheet and stable operations.

“bonus shares” are additional shares that are issued without charge to existing shareholders.

This is occasionally done following a period of successful operation, or in place of a cash dividend.

However, a bonus share has no effect on the value of the shareholding.

For example, a shareholder may have 9 shares worth $10, for a total shareholding of $90.

Following a 1 for 9 bonus issue, the share price would fall to $9 to reflect the larger number of shares, and the shareholder would have 10 shares worth $9 each.

The total value of the shareholding remains unchanged in these circumstances.

Bonus issues can be used as a nominal reflection of a period of successful operation.

4.2.4.1.1. Equity terms

Buyback	The company buying its own shares and then cancelling them. This can be an on-market buyback, when shares are bought through a stock exchange, or an off-market buyback, where shareholders are contacted directly. This is used to reduce equity capital, as an alternative to a capital distribution or dividend.
Capital distribution	A distribution of equity funds from the company to shareholders, at a certain amount per share.
Capital reconstruction	A change in the structure of existing shares, such as a share split that changes each existing share into two new shares. This is sometimes combined with an equity raising or capital distribution.
Corporate action	A transaction involving a dividend, rights issue, share split, or other event affecting a shareholding.
Dilution	The effect that an existing shareholder's value is reduced if new shares are issued at a discount to the current market price.
Dividend	A payment of equity capital to shareholders. Generally made twice-yearly, and set to an amount that is a proportion of the average profit level.
Float	To convert a company to a public company by issuing a prospectus, and selling a large section of the shares to the general public. The shares are generally listed for trading on a stock exchange a short time after the subscription period has closed.
Listed company	A company in which the shares can be bought and sold through a stock exchange. Only public companies can be listed.
Non-renouncable rights issue	A rights issue where the rights cannot be traded. The shareholder must either subscribe for the new shares, or the rights lapse.
Partnership interest	A share in a partnership. Partnership interests are not tradable as individual units in the way that company shares are. However, a new partner can buy the partnership interest from a partner who is withdrawing, and replace the previous partner in the partnership.
Private company	A company that is not a public company. A company must have a minimum of one director and one shareholder (who may be the same

	person).
Prospectus	A detailed document containing a full set of accounts and a written review of the business. A prospectus is required before a company can be floated, or before an issue of bonds to the public can be made.
Public company	A company that meets certain basic minimum requirements, such as a minimum of five shareholders. Most large public companies are listed, with their shares traded on a stock exchange.
Renouncable rights issue	A rights issue where the investor can sell the right to subscribe for a new share, usually for a small amount equivalent to the discount, through the stock exchange. Another investor can then purchase the right and subscribe for the shares.
Rights issue	A method of raising additional funds from shareholders. Each shareholder is offered the right to subscribe for a number of new shares, in proportion to their current shareholding.
Share	Ownership of part of a company. The ownership of companies is generally broken up into a large number of shares. Each share is entitled to one vote at a company meeting such as the annual general meeting, receives dividends when dividends are paid, and generally rises or falls in value depending on the operating conditions of the company and general economic conditions. Each share corresponds to one share of the assets of the company, which applies in the case of a liquidation or takeover.
Share consolidation	A company action that results in existing shares being merged into a smaller number of new shares. This is done when the share price has stabilised at a low level, however the future outlook is positive. This does not usually occur when share prices are low, unless the company has a considerably improved outlook.
Share Split	Splitting existing shares into a larger number of new shares. The share price falls to the level that results in the total value of the shareholding, and the total market capitalisation, remaining unchanged. This is sometimes done when a share prices rises above the usual trading price range for company shares.

Shareholder	A party who owns a share in a company.
Subscribe	To complete an application form in a prospectus, send the application form and a cheque, and receive shares in the company. This also applies to subscribing for bond issues.
Venture capital	Investment funds that specialise in making direct equity investments in small and medium sized private businesses.

4.2.4.2. Assets

4.2.4.2.1. Types of assets

Businesses hold assets of various types.

For example, in banking the assets are loans due from customers, while in insurance the assets may be funds held and invested to meet insurance claims.

However, in general business activity, the assets of a business usually fall into three major categories.

These are:

Property, plant and equipment	Physical items including land and buildings, manufacturing plants, equipment, vehicles and so on.
Intangible assets	Brand names, newspaper mastheads, broadcasting licenses, patents, etc.
Cash & liquid assets	Reserves of cash on deposit, tradable securities, bonds, and other assets to support funding and business operation.

4.2.4.2.2. Managing assets

4.2.4.2.2.1. Financial Assets

In the case of banking, managing the assets involves credit assessment of loans and ensuring that loans with a poor credit outlook are not accepted, and that loans with a favourable credit outlook are not rejected.

Within insurance, as another example, managing the assets may involve funds management issues including allocating funds across fixed interest, shares and property investments, managing the term and structure of debt portfolios, risk management and so on.

Managing liabilities within insurance involves the underwriting process of assessing risks, determining premiums, and accepting or rejecting applications.

4.2.4.2.2.2. Physical assets

Managing physical assets involves organising insurance and maintenance, buying and selling assets, replacing expired assets, and ensuring that the appropriate mix of assets is held.

Insurance can be arranged for physical assets in various ways.

Large items may be insured under general insurance contracts.

In the case of manufacturing facilities and specialist equipment, in some cases a specific insurance policy can be arranged for the facility itself.

In some cases, items of smaller value are not insured.

This is effectively a “self-insurance” arrangement, with the company bearing the risk of equipment being lost, stolen or destroyed by accident.

Contract service arrangements for the supply of items such as computer equipment may involve a number of different approaches.

Individual items may be leased by the business, an overall fee may be charged for the whole set of equipment, or the business may purchase the equipment, with support provided on a fee-for-service basis.

Maintenance of equipment can be performed by in-house operations, under a maintenance service contract with an external party, or on an ad-hoc basis using external services.

4.2.4.2.2.3. Intangible assets

Intangible assets include patents, licences, media mastheads and brand names.

Brand names may need a regular promotion and advertising expense to maintain the value of the brand name.

Raising a brand name to a public profile that results in value appearing for the brand name itself may require considerable time and expense in advertising and promotion.

One school of thought holds that a profile position can be maintained over the long term with regular promotion, however once the brand name has fallen from public view, it cannot be resurrected.

4.2.4.2.3. Replacing assets

Some businesses retain their physical assets for long after their efficient working life has expired.

This may be done to avoid paying the cost of replacing the equipment.

Also, this may involve an attempt to extract every last drop of useful value from an item of equipment.

However, this approach can be a false economy.

Outdated equipment may have a low production rate, use many raw materials, have a high error rate, require excessive maintenance and have a high frequency of down-time.

Also, technology advances as time moves by, and more recent machines may be more efficient than an equivalent version of older technology.

Equipment and facilities do not need to be kept until they literally fall apart, and in many cases a better result is achieved by scrapping equipment when its performance begins to deteriorate significantly, and investing in new machinery and facilities.

While this may require funding through debt or equity, and a large depreciation expense may be generated by the new facilities, this may also lead to a large increase in production efficiency and production capacity.

4.2.4.2.4. Funding replacement assets

Replacement assets can be funded in a number of ways.

In the case of smaller items, this may come from the general available capital held within the business.

In large replacement programs, debt or equity may be raised specifically for a capital expenditure program.

Equipment that is leased can be replaced without any funding requirements.

Another approach is to raise a loan specifically for an equipment purchase, with the loan secured against the item of equipment.

In some cases, replacement assets are funded using a "sinking fund".

A sinking fund is a fund that is allocated when the asset is first purchased.

Money is set aside each year, and deposited into the sinking fund.

At the end of the useful life of the equipment, the sinking fund should hold sufficient assets to enable a replacement item of equipment to be purchased.

The sinking fund may be a physical bank account or another type of asset, although usually this is just an accounting entry in the general liabilities of the business.

4.2.4.2.5. Backup facilities

Assets may cease to be available due to faulty equipment, fire damage, or for various other reasons.

Backup facilities involve facilities put in place to enable production to continue if a major asset is unavailable.

"redundancy" is one approach to this.

Redundant assets involve maintaining two or more facilities that perform the same function.

For example, a manufacturing facility could be developed in two halves, with each half of the facility being a mirror image of the other.

A break-down in one section would then allow production to continue, although at a reduced rate.

This approach exists in many physical systems, ranging from the designs of aircraft to the structure of some biological systems.

Cross-connections may also allow one part of a facility to be used to service both facilities for a short period of time, in the event of an equipment failure.

Less dramatic examples of backup facilities include back-up generators to supply electricity, and computer data backups to allow computer operation to be restored in the event of a hardware failure.

4.2.4.3. Balance sheet vs. Off-balance-sheet assets

Equipment and facilities can often be held in two different ways.

Balance sheet assets involve buying the equipment or facilities.

This may be funded through equity or debt.

Off-balance-sheet assets involve leasing equipment and buildings.

The use of balance sheet assets leads to an asset-based business structure, while the use of off-balance-sheet assets leads to a cash flow based business structure.

A cash flow based structure is generally a more flexible structure than an asset-based structure, and allows the business to adapt more easily to changed circumstances.

There are various issues involved in the choice as to which method to use for particular assets, and which method to use in general for the business activity

4.2.4.3.1. Raising funds

Balance sheet assets require raising funds, either equity funds from investors, or debt funds from lenders.

In some circumstances, particularly with public companies, this may not present any great difficultly.

However, in other cases funding may not be available, or funding may be possible, but the business owners may not wish to increase debt levels or raise additional equity.

Also, the fund raising process can involve considerable time and cost.

Using off-balance-sheet assets does not require funding.

4.2.4.3.2. Flexibility

The flexibility of the various arrangements may vary considerably.

Selling assets can be a slow and expensive exercise.

In contrast, leasing property may allow a business to move to another building with little expense or difficulty.

In the case of a large organisation, relocating buildings may be a major exercise that may involve a complete re-writing of telephone and computer data services, installing desk space and facilities, and so on.

The process can take a full year.

However, this process needs to be done whether the building is owned or leased.

Selling an existing building and purchasing another building may add an even longer time delay to the option of changing premises.

In the case of smaller organisations, moving from one leased building to another may be possible in a relatively short period of time.

An exception to this may occur when a long lease is in place, and an alternative tenant cannot be found.

However, in general a change from one leased building to another is far simpler and cheaper than selling one property and buying another.

4.2.4.3.3. Cash flow

Lease payments are a fixed cash flow.

In the case of debt-funded balance sheet assets, the interest payments are also a fixed expense.

However, with equity funded assets, there are no cash flows required to meet interest or lease payments.

This may reduce the risk of negative cash flow and insolvency problems caused by the fixed costs of debt-funded or off-balance-sheet assets.

For example, if a business owned a building and had little debt, then it could survive a period of time with very little income without becoming insolvent.

However, in the case of leasing or debt, the regular payments would have to be maintained regardless of the level of sales.

Strictly speaking, there is no financial difference between the two approaches, as the interest or lease payments would balance the income that could be generated if the equivalent level of equity was invested elsewhere.

However, from a practical cash flow perspective, a business that owned most of its assets and had little debt would be in a more secure position to withstand a period of low income than a business with high fixed costs.

4.2.4.3.4. Asset values

Balance sheet assets need to be depreciated, and assets may have to be re-valued from time-to-time.

This leads to a more complex financial structure than a leasing arrangement, where individual payments are made for the lease as time goes by.

Under a lease arrangement, a single expense is involved.

In contrast, a debt-funded purchase would involve a balance-sheet debt and asset, interest costs, depreciation, asset re-valuations and so on.

4.2.4.3.5. Off-balance-sheet debt

Leasing equipment and other arrangements can be used as a source of debt that is not included within the structure of the company, or recorded on the balance sheet.

These items are recorded in the accounts as an expense, rather than as property owned by the business.

Off-balance-sheet debt is used to avoid breaching debt covenants, to raise debt when other approaches are not available, to avoid affecting the structure of the balance sheet, and to package transactions in a convenient way.

Off-balance-sheet debt may often be “limited recourse” debt.

This means that the debt is only secured by the asset itself, and the balance sheet is not exposed to the risk that would be incurred if standard debt was raised.

Off-balance-sheet debt has several advantages for the business, and where this type of transaction is available, this may be a useful benefit in the financial management of the business.

Leasing may have two different characteristics.

An “operating lease” is similar to hiring equipment.

This is simply a rental payment made in exchange for using equipment for a period of time.

This type of arrangement is used for leasing properties, some equipment leases, and for short-term hiring of facilities.

A “finance lease” is similar to a packaged loan and purchase arrangement.

In this case, the equipment is leased, with the transaction being similar to raising debt and then purchasing the asset.

In the case of a finance lease, an asset and a debt are listed in the balance sheet.

Accounting standards vary in the treatment of leases and other off-balance-sheet debt.

In the practical sense, a lease is an operating lease unless the business is affected by changes in the value of the asset.

This is usually not the case.

The difference between an operating lease and a finance lease is not clear-cut, and the decision as to how to account for a lease may depend on issues such as who maintained the equipment, which party was exposed to rises or falls in the asset value, the arrangements at the end of the lease, and so on.

Some leases are treated as finance leases, with an asset and a debt being placed on the balance sheet, rather than a simple expense being recorded.

4.2.4.4. Capital management transactions

4.2.4.4.1. Sale-and-Leaseback

A sale-and-leaseback is a capital management transaction that involves selling the business premises, and remaining within the building as a tenant.

This transaction may have several benefits.

A sale and leaseback can be used to raise funds in the case of the business striking financial difficulty, without the problems associated with relocating to another premises.

This is particularly relevant if there are specialist facilities within the operation, such as vaults within bank branches.

A sale and leaseback frees up the capital in the balance sheet, and allows the physical premises to be managed more effectively, with the ability to reduce or increase the number of business premises without great difficulty.

Some very large sale-and-leaseback transactions have been conducted, in some cases involving nationwide organisations with a large number of individual properties.

These properties can be sold as a single parcel into a property investment trust, or sold individually to investors.

The price that is received for a sale of a property in this way may be strong, as the building is usually sold with a long-term tenancy agreement.

4.2.4.4.2. Retiring debt

In the case of personal lending, most loans are amortising and reduce in value through the term of the loan.

However, in the case of business debt, interest payments and capital changes are generally split into two separate issues.

Debt is frequently rolled-over for a new period at the previous level, and reductions in debt are usually based on a specific decision to reduce the amount of debt held by the business.

In cases where the cash flow from operations is strong, the cash flow may provide an opportunity to reduce the debt level.

Strong cash flow from operations provides several main opportunities.

These include:

- Retiring debt.
- Building up the equity funds to strengthen the capital base, or to prepare for a major transaction such as buying another business, funding a new start-up operation, or funding a major capital expenditure program.
- Arranging a capital distribution to shareholders.

4.2.4.4.3. Capital distributions

A company may hold excess capital following an extended period of strong cash flows, or following the sale of a major asset or a major part of the business.

This can also occur due to buoyant economic conditions, a successful product, or the income phase of a project following a long and expensive development process.

When excess capital accumulates within the business, various steps can be taken.

In some cases, the capital is simply retained within the business structure, such as a company structure.

However, this may lead to low return-on-capital figures, due to the fact that the excess capital is not necessary to support the business operations.

When an excess capital situation arises, this often prompts a search for a suitable investment or project to use the funds.

Expanding the business and developing new markets is a natural part of business operation, and this is a common response in these circumstances

The business owners should generally be aware of opportunities as they arise.

However, the act of actually seeking an investment opportunity often leads to a poor investment decision being made.

This may involve buying another business at an excessive price, buying a business for integration that is not really suitable to be integrated with the existing operation, or purchasing a business for investment the leads to losses or a low long term return.

In these cases, a new direction is chosen that is often not an effective direction for the business, and is simply chosen because a better alternative could not be found.

This can ruin an otherwise successful business, as new operations are integrated with existing operations, periods of low profitability or negative cash flow occur, and the general condition of the business deteriorates.

In these circumstances, a capital distribution to the business owners may often be a better alternative.

This would be a decision made by the business owners in the case of a small or medium sized enterprise, while it would be a decision of the management team and the board of directors in the case of a large public company.

A capital distribution reduces the capital within the business to the level required to support the business operations, including normal expansion and investment activities, and allows an efficient operation to continue.

Announcing a capital distribution to shareholders and a reduction in capital is a sign of good financial management by the operators of a business.

4.2.4.4.4. Dividend Policy

In a period in which a profit is generated, this profit can be retained within the business accounts, or distributed to the business owners as a dividend payment.

Dividend payments are a capital transaction, rather than an expense.

Dividends are usually paid in cash and reduce the cash balance within the business.

When a profit is generated, it can be retained within the business accounts to finance expansion and the replacement of assets, or it can be paid as a dividend.

Businesses have varying policies regarding dividend payments.

No dividend payments

Some businesses do not pay dividends.

Generally, in cases of start-up operations, periods of negative cash flow, and high-growth industries, all capital is retained within the business and dividends are not paid.

Small and developing enterprises do not usually pay dividends, as all the capital generated from profits is required to sustain and develop the operation.

Also, some large companies have a policy of not paying dividends, and retaining all capital to fund expansion.

Full dividend payments

At the opposite extreme, some companies pay all profits out as dividends.

This generally occurs in the case of businesses with stable long-term operations, and little requirement or opportunity to fund expansion or new development.

Successful single-product companies that have developed a sustainable position within a market can be an example of this.

In these cases, the business operates in the same way from year to year, with income being received, expenses being paid, and profit being distributed as dividend payments.

A business of this type can result in a long-term regular income stream, and may sometimes be valued in a similar way to a fixed-interest bond.

Examples could include a data service supplying information to trading operations, or a successful food product based on a unique recipe, where sales settled at a stable level over a long period of time.

Partial dividend payments

The majority of medium sized and large companies pay out a proportion of profits as dividends, and retain a proportion of profits to fund replacement of assets and expansion programs.

The proportion that is paid out is known as the “payout ratio”.

This can be calculated using the following formula

$$\text{payout ratio} = \frac{\text{dividend payment}}{\text{net profit}}$$

For example, a company may have a net profit of $8 for a period, and may distribute dividends of $6.

In this case, the payout ratio could be calculated using the following example

$$\text{payout ratio} = \frac{6}{8}$$

$$= 0.75$$

$$= 75\ \%$$

In the case of listed shares, this formula may be expressed in the following form.

$$\text{payout ratio} = \frac{\text{dividend per share}}{\text{earnings per share}}$$

Stability of dividends

It is common practice to set the dividend payment to a conservative level.

This approach allows a similar dividend to be paid each year, regardless of rises and falls in profit.

This may be done for several reasons.

Shareholders do not react favourably to the dividend being reduced, and so the management of large companies generally only increases the dividend payment when there is a view that a sustainable increase in profit levels has occurred.

This reduces the chance that dividends will have to be reduced in future years.

Dividend payments do not affect the total assets of the shareholders, as this simply transfers funds from within the company to the individual shareholder's personal name.

This is reflected in the fact that the share price falls on the day of the dividend, by an amount equal to the dividend payment.

General trading and other issues such as tax effects may affect the actual price move on the day, however the size of the price fall is based on the size of the dividend.

From a cash flow perspective, the dividend is a cash payment that is used as regular income by some shareholders, and for this reason a stable level of dividends is preferred to one that rises and falls by large amounts.

4.2.4.5. A comparison of funding structures

The following table presents three different funding arrangements for a business operation.

The asset in this example has a value of $100, and generates a net income of $20 from operations.

The figures are given for a funding arrangement using equity only, debt only, and a leased funding arrangement.

The example assumes that the interest rates on the debt and the lease are the same, and that the principal component of the amortising lease is equal to the depreciation amount.

	Balance Sheet Owned Assets Equity Funded	**Balance Sheet Owned Assets Debt Funded**	**Leased Assets**
Assets			
Equipment	100	100	0
Cash	50	50	50
Total Assets	150	150	50
Liabilities			
Debt	0	100	0
Net assets	150	50	50
Operating income	20	20	20
Depreciation	10	10	0
Interest expense	0	5	0
Lease expense	0	0	15
Net income	10	5	5
Gearing	0 %	66 %	0 %
Return on Assets	6.7 %	3.3 %	10 %
Return on Equity	6.7 %	10 %	10 %

This example illustrates the care that must be taken in interpreting the “return on assets” and “return on equity” figures of a business operation.

In all three cases, the same physical assets are used and the same operations are performed, however these figures are widely different depending on the funding arrangement used.

4.2.5. Expense and capital decisions

A number of approaches may be taken in deciding whether to incur various expenses, or invest in projects, facilities or equipment.

This may involve some of the following approaches, depending on the particular circumstances.

4.2.5.1. Return on investment

In some cases, the income that may flow as the result of a capital investment may be directly estimated.

This may apply in the case of new product developments, for example, where estimates may be made of the long-term sales of a new product.

This situation may also apply in the case of development projects that may be sold, either to a specific client who may request a development, or in the general market.

In cases such as these, a net-present-value approach may be used to determine an effective return from the project.

The internal rate of return from the project may be calculated, particularly in cases that may involve a single payment at the beginning or end of the project.

Alternatively a discount rate incorporating a risk premium, or a target hurdle rate of return, may be used to determine a net present value for the project.

These approaches are based on discounting future expenses and income of the project to present values, to determine an effective value of the project or an effective return on the capital that is invested.

4.2.5.2. As required

In practice, some expenses may be necessary in order to continue an effective business operation, regardless of issues of investment returns.

For example, changes in government regulations may require changes in administration procedures, product designs or business activities.

As another example, a new product may not be able to be effectively administered until a computerised administration system has been written to provide the administration storage and processing functions.

However, this approach may need to be used with caution.

A wide range of expenses may be considered “necessary”.

In reality, very little is actually necessary.

Manufacturing could be performed using hand assembly and basic tools, while business processes could be performed using paper and pencils.

A large number of business activities may be devoted to two fundamental functions

These may be

- Increasing efficiency
- Risk management

Efficiency may involve a wide range of issues. This may include some of the following points.

- The accuracy and quality control of completed products.
- The cost of producing each item.

- The volume of items that may be produced within a time period, from facilities of a particular size and cost.

- The time delay that may be required between a client's customised order being lodged, and the item being available for the client.

- The capital value and investment required to create, operate and maintain the business activity.

Each expense or capital expenditure decision may need to be assessed in the light of the impact that it may have on some of the previous points.

4.2.5.3. General business impact

Some expenses, projects and activities may need to be assessed in terms of their overall impact on the business activity.

This may include re-structuring the business operations into different areas and structures, advertising campaigns, new computer facilities and software, internal development projects, updating business activities and so on.

4.2.5.4. Fixed budget

In some situations, an expense may not involve a single fixed amount.

In these cases, a fixed budget may be allocated for a particular expense, and operations may continue until the expense budget has been used.

For example, a project may estimate that the cost of creating a new product for a new market may be $10.

A decision may then be made to allocate an advertising budget of half the development expense, or $5.

This may be partly an arbitrary decision, with either a large or small budget allocation being possible.

In contrast, a transaction such as purchasing an item of equipment may involve a fixed cost, which may be assessed in light of the costs and potential benefits.

This approach may also be used in cases such as product refinement and improvement.

A refinement and improvement process may be potentially unlimited, and could continue in theory for ever.

However, a limit may need to be placed on activities such as these, to prevent costs becoming excessive, and to ensure that a product is actually completed and may be used or launched.

For example, a development process may involve a 12 month period in creating a product design.

Following this process, a decision may be made to allocate another two months of development time, in order to refine and improve the product design.

Following this process, the design may be frozen and production may commence.

4.2.6. Structured transactions

A structured transaction may involve a transaction that includes a number of different components.

For example, an asset may be sold in combination with a debt facility, as a single transaction.

This arrangement may be similar to raising debt directly to purchase an asset.

However, a number of advantages and disadvantages may be involved in using a structured transaction.

Structured transactions may be arranged by investment banks, financial service organisations such as banks, stock brokers, and sellers of assets.

This type of arrangement may be used for very large transactions, such as the funding of infrastructure assets such as airports, and also for small transactions at the retail level, involving members of the general public.

4.2.6.1. Types of structured transaction

One approach may involve packaging an asset and a debt facility within a single transaction.

This may be arranged by a financial services organisation, or by the seller of an asset.

Other types of structured transactions may include packaging of options and futures instruments into transactions that may be purchased directly through a retail arrangement, as a form of risk management against market price moves.

For example, a property investment transaction may include the sale of a property, the loan used to purchase the property, and an option to reduce the risk of interest rates rising above a specified level.

Another example may involve the vendor financing the sale of a business, with the business seller providing the financing for the business purchase.

4.2.6.2. Advantages of structured transactions

Convenience

A structured transaction may avoid a considerable amount of time and effort that may be involved in arranging the various components of the transaction.

In some cases, a structured transaction may be arranged simply by making the relevant payments and signing the relevant documents, in contrast to some asset transactions that may extend over several months as various documents are arranged and various steps in the process are conducted.

Availability

In some cases, a facility or feature may be available within a structured transaction may not be available through other sources.

For example, although futures and options may be traded by the general public, a range of practical issues such as margin accounts and minimum contract sizes may lead to this approach being complex in situations where only one or two transactions may be conducted.

In other cases, financial instruments such as "swaps" may be traded in large corporate markets, and may not be available in the size that may be applicable to individuals or small enterprises.

Economies of scale

In some cases, costs within a structured transaction may be low, due to economies of scale.

For example, a financial services organisation may raise a large sum of debt to fund a major transaction, with the interest rate possibly being lower than the interest rate that may be available through direct individual borrowing.

Fixed costs such as legal fees and registration costs may also be spread across all holders of the structured transaction, rather than being fully borne by the business itself.

Credit assessment

Some structured transactions may not require a credit assessment of the business, while in other cases a basic credit assessment may be conducted, that may involve lower requirements that a direct loan arrangement.

This may occur due to the fact that a structured transaction may involve an asset within the structure being held as security for the debt, and may also involve cash flow from the structure being automatically directed towards the debt repayment.

A lack of credit assessment may avoid the time and effort that may be involved in a standard credit assessment process, and may also be useful in cases where the business may be unable to raise debt directly.

Limited recourse debt

Some structured transactions may involve a "limited recourse" debt arrangement.

In this case, the security for the debt may be limited to the assets that are held within the structure.

This may reduce the risk exposure for the business.

In the case of insolvency, if the sale of the assets within the structure does not raise sufficient funds to repay the entire debt, then the remaining debt may not become an additional debt to the business.

Gearing levels

Structured transactions may have high gearing levels.

This may occur due to the asset security embedded within the structure, the possible re-direction of cash flow to debt servicing, and possibly features such as options that may reduce the risk of the structure failing, and losses occurring to the business or the lender.

This arrangement may be useful in preserving the existing capital of the business, rather than requiring capital to be allocated to deposits, margins or partial payment of assets held within the structure.

4.2.6.3. Disadvantages of structured transactions

A number of disadvantages may also apply to these types of structures.

Fees

In some cases, the total cost of a structured transaction may be lower than the equivalent cost of arranging the transaction directly, due to economies of scale that may be involved in arranging the packaging.

However, in other cases, large fees and commissions may be embedded within the structure of the transaction.

Where possible, a comparison may be made with an equivalent transaction that may be arranged directly, to estimate the cost-effectiveness of the packaged transaction.

However, in the case of complex structures, direct comparisons may not be practical, and the cost of a transaction may need to be assessed in light of the potential benefits of the transaction and the likely return from the structure.

In some cases, the cost of various components may be specified within the product description, included fees and commissions related to various components of the structure, and relating to the structure itself.

Flexibility

Although a structured transaction may include several optional components and selectable values, the structure of the transaction may not exactly match the structure that the business may chose if it was arranging the transaction directly.

Features may be included that may require a cost, however the business may not wish to include those features in a transaction.

In other cases, features may be missing that may be desired, or various restrictions, early withdrawal penalties, and other conditions may apply.

Also, in general the entire structure may need to be unwound as a single action.

In the case of transactions in which the components are arranged individually, it may be possible to alter each component individually as time passes.

In some situations, a structured transaction may be a less flexible alternative than arranging the components of a transaction individually.

4.3. Marketing & Distribution

4.3.1. Marketing

Marketing involves generating sales of the business's products and services.

This includes some of the following areas.

Product design	Involvement in selecting the broad range of products to be produced by the business, including the type of product, the volumes produced, the expected or target group of customers, and the size and complexity of the items.

Market position	Selecting the area of the market to operate in. For example, a business may produce low-cost basic items, customised items, full-service or discount-service operations, high-risk credit or low-risk credit, and so forth.
Promotion	Organising advertising and promotion activities in reference to the general public, and organising proposals, tenders and submissions for other businesses or large clients.
Sales	Dealing directly with customers enquiring about or requesting products or services.
Market development	Developing new markets for the business's products, such as introducing a new product to an existing market, or developing a new client base in another geographical location

4.3.1.1. Product design

Product design from a marketing perspective may involve selecting product designs that will meet demands from potential customers.

This is one input to the product design process.

In some cases, a feature or aspect of a design may have little impact on the customer, and may be difficult or expensive to include within the completed product.

In other cases, a minor change may be relatively simple to implement, but may provide a significant improvement in the product from the customer's perspective.

A successful product must be both attractive from the customer's perspective, must also be able to be produced efficiently and in a practical way.

4.3.1.2. Market position

Market position involves selecting the part of the market to operate in.

For example, a business may produce light fittings.

The market for light fittings may include a number of different areas.

This could include high-volume, low-cost light fittings for commercial buildings such as small warehouses, higher quality items for household use, customised light fittings for particular purposes, or specific individual designs.

Selecting the market position would involve deciding which type of fittings to produce and which area of the market to operate in.

This decision may be based on the resources available to the business, the size of each market segment, margins and competition in each market segment, and the interests and long-term preferences of the business owners.

4.3.1.3. Promotion

Businesses generally deal with either the general public, or a relatively small number of clients or other businesses.

In the case of the general public, promoting the business may involve organising advertising campaigns, promotion activities such as competitions and special offers, and rising the profile of the business through other activities such as involvement in conferences, exhibitions and events.

In the case of a smaller group of clients or customers, this may involve preparing written tenders or proposals, giving presentations to potential clients, and ensuring that the business appears within industry events such as business surveys and trade fairs.

Preparing tenders and proposals can be a significant task.

In some cases, several months work may be involved in preparing a single submission.

This task may involve input from a number of people including marketing staff, technical staff, and other parties such as product managers.

The stakes may also be high in these cases, as in some industries the entire industry may be composed of two or three potential clients.

In the cases of a rejected submission, the business can lodge another proposal with the potential client at a later date.

However, a period of six to twelve months must generally pass before a business can submit a new proposal to a client who has reviewed a proposal and declined to participate.

Advertising and promotion activities are generally organised in conjunction with an advertising or promotions agency.

Advertising agencies design advertising campaigns in conjunction with the client, and organise the actual production of material and appearance of the product, such as a magazine advertisement.

Promotion agencies organise promotion activities such as distributing sample products at major events.

4.3.1.4. Sales

Sales involves dealing with customers and clients during the process of conducting an actual purchase transaction.

In some cases, potential customers or clients are approached directly, and asked whether they would be interested in the business's products or services.

This approach is particularly relevant to new businesses operating in an established market, and to cases where a new and unfamiliar product is introduced.

However, in general a customer approaches the business in order to purchase a product or service.

This may be derived from some of the following sources:

- A response to advertising.
- Word-of-mouth information.
- Information located from a directory such as a telephone book or on-line service.

- A general response to the profile of a business within a small industry.

- Contract following a previous purchase from the same business.

The sales process may involve demonstrating items and responding to customer questions, after which the customer would make a decision to purchase the product or to decline to purchase the product.

4.3.1.5. Market development

Market development involves creating new client bases and markets for the business's products and services.

This may involve introducing the products or services to a new geographic region, such as interstate or overseas sales.

Expanding the business's operations into a wider area is one of the major fundamental ways that business expansion can occur.

This may involve discussions with potential distributors of the products.

This process may involve some of the following activities:

- Supplying product specifications and samples.

- Providing information to support the ability of the business to supply the products in the necessary volumes on a reliable basis.

- Negotiating supply agreements.

In the case of direct sales, this may involve approaching potential customers, and organising advertising and promotion activities.

When new products are introduced, a considerable lead time may be involved in developing a market for the new product.

This may involve mail-outs of information to existing customers, advertising and promotion, and contacting potential customers directly to supply product specifications and samples.

4.3.2. Distribution

A wide range of methods are used to distribute products from the business to the customers who purchase the product.

Effective distribution is a major component of the success or failure of a business enterprise.

Distribution involves a process by which the products or services can be presented to a customer for potential purchase.

This may involve retail stores, on-line or mail order, and third-party distribution through the activities of other businesses.

4.3.2.1. Closed distribution channels

Before the decision to purchase a product can be made by a customer, the product must be readily available to the customer.

This may be a major challenge, as in some cases this cannot be directly controlled by the business.

For example, a manufacturer of clothing may find that the department stores and fashion boutiques that the business contracts decline to carry the products as stock.

Products sold through supermarkets are another example of this.

Shelf space on supermarket shelves is hotly contested.

Simply placing an item on the self of a supermarket, at a reasonable price, may be sufficient to result in a steady stream of sales.

Conversely, if a major supermarket chain declined to carry a product then this may have a large impact on sales.

Long-term agreements with suppliers and supermarkets may exist for the allocation of limited shelf space, and in some situations the supplier may pay a fee to the supermarket to allow the product to be held on their shelves.

Accessing closed distribution channels may involve a considerable time delay, and may involve providing product specifications to distributors, providing samples, offering discount periods and subsidies for a limited time, and creating a profile for a product.

For example, distributors may be more interested in carrying a product if there is a customer demand for the product, or if the product has already established significant sales through other channels.

4.3.2.2. Methods of distribution

4.3.2.2.1. Direct to public

Direct sales to the public include a wide range of business activities where members of the public purchase goods and services directly from the business.

The includes retail stores, home services, services such as medical, legal and accounting, and utilities such as gas, electricity and telephone services.

Transport, such as air travel, is another example of direct sale to the public.

Direct sales to the public are a simple approach that avoids the need to negotiate with distributors.

This allows the purchase decision to be made directly by the end customer.

Prices may be lower than in the case of indirect distribution, due to the fact that commissions and payments to distributors are not required.

However, this approach also has disadvantages.

In these cases, advertising and other promotions must be used to make the product visible and to generate sales.

Advertising can be expensive and a business that deals with the public at large may find that significant capital expenses are needed to create a sufficient profile to result in a steady stream of sales.

Costs related to administration, customer service, providing display space and so forth may be higher when direct sales are used, rather than when products are sold through other channels.

Also, this approach is only applicable to goods and services that are purchased directly by individuals.

4.3.2.2.1.1. Direct access

Direct access includes retail stores, businesses that operate from offices, and businesses that come directly to a home such as trade services.

4.3.2.2.1.2. Telephone access

Telephone access includes utilities such as gas and electricity supply, data services and so forth, where contract between the customer and the business usually occurs through large volume telephone call access.

4.3.2.2.1.3. Mail order

Mail order is a low-cost distribution system that involves customers ordering from catalogues or advertising information, for direct delivery of the product.

This method can be set up with very little capital and a simple operation, and can handle either small or large volumes of trade.

Mail order also involves few fixed costs such as leased building space.

However, customers do not get the opportunity to examine the products, and they do not generally have the opportunity to discuss the products or raise questions about the goods.

Mail order distribution can be created without great difficulty, however the success of a business that operates on this basis requires that products can be delivered at a price that is significantly below the price of equivalent goods that are available in retail stores.

Mail order also has a very low response rate, with replies to marketing material being a few percent or less of the volume of information distributed.

4.3.2.2.1.4. On-line

On-line distribution involves advertising and distribution through internet and other on-line access methods.

This is similar to a mail order approach in that the customer does not have physical contract with the business or with the goods before they are purchased.

However, a considerable amount of information may be included about products in an on-line site.

This may include technical details and specifications, photographs of products, and even video sequences, such as a short sequence displaying the rooms and facilities of a hotel or a property for sale.

Although items cannot be physically inspected through on-line sites, and questions concerning products cannot generally be asked, information of this type may not be available though a direct retail arrangement.

Creating an effective on-line distribution site may involve significant expense.

In the case of a small number of products, this arrangement can be created fairly easily.

However, if the business produces a wide range of products, and the ordering, payment and inventory management are integrated into the on-line access system, a significant investment in capital may be required to create and maintain the service.

On-line access has the advantage of allowing an extremely large number of potential customers to access the information concerning the product and to order products.

On-line access also allows for international sales without any additional marketing and development expenses.

In some cases, businesses offering a major on-line presence may find that the majority of their sales are to overseas customers, and they may sell very few products within the home country of the business itself.

Disadvantages of this approach include the fact that the products cannot be physically inspected before purchase.

Also, the on-line site may not be accessed unless traditional advertising and other approaches are also used to raise the profile of the products among customers.

On-line products can be compared very quickly and easily against competitor's products and prices, and this may result in prices being highly competitive between alternative suppliers.

4.3.2.2.2. Direct to other businesses

A large number of products are sold to other businesses rather than to individuals.

This includes mining products, agricultural products, equipment, and business services.

In the case of large project developments, such as commercial construction and computer software development, the business may deal directly with a small number of clients.

Advertising is less important in this market, with price, quality and reliability of supply being major issues.

Communication may be direct between the business and the customers.

New businesses and new product areas may approach potential customers with sample products and product information, and attempt to negotiate on-going supply agreements, or supply small volumes of sample goods on a trial basis.

Also, many industries operate with a three-tiered structure.

In this situation, producers supply products to wholesale distributors, the wholesale distributors supply retail distributors, and the retailers sell the products directly to the public.

In this situation, distribution may involve dealing with a small number of wholesale distributors.

For example, fruit and vegetable growers may supply wholesale distributors, who in turn may supply individual retail operations.

Both the wholesale and retail distributors in this case operate distribution businesses.

4.3.2.2.3. Individual Agents

Some products and services are sold through agents who represent the products to potential customers.

Insurance has traditionally been sold in this way.

Customer contact may come from approaches by the agent, such as door-to-door, cold calling from lists of names and contact details, or through referral by another individual.

For example, in a real estate transaction, the real estate agency may refer the potential client to an insurance agency.

Approach may also come from the customer, responding to advertising, or through general enquiries for products or services.

Agents can be tied, in which case that operate for a single organisation only, or independent, where they operate for a range of different organisations.

Agents can be paid a salary, which would normally include a large variable component based on the number of sales.

In other cases the agent receives a commission fee for each product that is sold.

In some cases fixed fees apply, while in other cases the commission or fee is based on a percentage of the size of the transaction.

The term "agent" in this context applies to situations where an individual distributes products or services that are produced by a separate organisation.

This is different from the use of the term within industries such as real estate, which involve providing a service directly in return for a fee.

Also, the term "agent" is different in the legal context, with the legal term "agent" referring to a party that has been granted authority to act on another the person's behalf and conduct legally binding transactions, such as signing contracts under a power of attorney.

4.3.2.2.4. Third-party distribution

Third party distribution occurs when a business has a standard business operation, but also acts as an agent and distributes products for other organisations.

For example, a bank may conduct general banking services, and also distribute investment products through direct mail to customers and discussions with customers concerning general financial issues.

Third party distribution is a major distribution method for financial services products such as insurance and investment products.

4.3.2.2.5. Sub-leased space

In some situations, a business can arrange display space that is sub-leased from a larger facility.

For example, some retail operations are based on a sub-leasing model.

This approach involves the main business operator leasing the facility and arranging services and advertising.

The individual business then sub-leases space within the facility from the main business operator.

Market stalls are another example of this distribution method.

This method is used for fruit and vegetable markets, direct distribution of products to the public, and craft items.

In this situation, the market operator arranges the facilities and advertising and organises the market.

Individuals and businesses can then pay a fee to operate a stall within the market.

4.3.2.2.6. Packaged products

In some cases, several products may be packaged into a single product.

This may occur in the case of some services, for example.

In cases such as these, the business's products may be used by other businesses for inclusion within a structured transaction, or a packaged service arrangement.

4.3.2.2.7. Markets and auctions

Some business products are sold in open markets through exchanges or auction processes.

For example, this may occur in the case of agricultural products, some mining products, and so on.

4.3.2.2.8. Co-branding

Co-branding occurs when a product is produced that carries two brand names.

For example, an association or organisation may arrange with a business to supply products under its own name, with the business brand name also appearing on the product.

In this situation, distribution activities may be handled by the other organisation.

4.3.2.2.9. Contract manufacturing and wholesale services

In the case of contract manufacturing and wholesale services, production may occur on behalf of another business.

For example, another business may holds brand names, create product designs and perform marketing activities, but may not have in-house manufacturing or service delivery facilities.

In these cases, the business may perform the actual production or service delivery.

Designs may be supplied by the other business, or a standard set of products or services may be supplied.

This situation may also occur in the case of seasonal businesses, and in situations where another business may not have sufficient production capacity to meet customer orders, due to strong demand or problems with in-house production facilities.

4.3.2.2.10. International distribution

International distribution involves exporting products to foreign countries.

This occurs in the case of large-scale manufacturing, and also in primary production such as agricultural and mining products.

Small enterprises may also be involved in exporting products.

For example, an enterprise may produce a range of traditional foods.

This enterprise could then export the product to customers in various parts of the world.

In other cases, a product may find demand in overseas markets if it is particularly unusual or innovative.

Some items, such as some specialised items of equipment, are only manufactured in a few places around the world and are exported to other countries.

In general, direct sale to the public in foreign countries would not usually be feasible due to the limited return from the costs of advertising and promotion.

In some cases, an importer in a foreign country may purchase the business's products and arrange distribution to retail outlets.

This approach allows the business to deal with a single customer, and avoid the cost and administrative burden involved in dealing directly with the public in another country.

Another approach may involve arranging third-party distribution with a foreign distributor.

For example, agreements for discount rates and promotions could be made between a hotel group and travel agency groups within other countries that were the source of regular tourist travel.

On-line access and ordering can be a major element of exporting.

In some cases, businesses receive more on-line orders from overseas than from local sales.

On-line access also has the advantage that no extra costs are involved with international orders compared to local orders, apart from shipping which may be paid by the customer.

4.3.2.2.11. Summary of distribution methods

Direct to public	Retail stores, office based businesses such as accountants, home and trade services.
Telephone access	Utilities such as gas and electricity, insurance.
Mail order	Product catalogues.
On-line	Internet sites allowing viewing product details and ordering products.
Direct to clients or businesses	Business activities that deal with a small number of clients or businesses, such as project development of construction or computer software, business services such as property management and so on.
Individual agents	Individuals who distribute products directly to the public, such as insurance.
Third-party distribution	Other businesses distributing the business products to their customers, in return for commissions or distribution fees.
Sub-leased space	Leasing space within a larger retail store or open market arrangement, as a method of displaying items to the public.
Packaged products	The business's products being included in packages assembled by other businesses, such as structured financial transactions, packaged services, and so on.
Markets & auctions	Sale of products through commodity exchanges, auction processes and so on. For example, agricultural products may be sold in this way.
Co-branding	Products are distributed with two brand names attached, the business itself and another brand, such as an association.

	Distribution activities may be performed by the other party.
Contract manufacturing & wholesale services	Products are produced on behalf of another business, with the other business performing the distribution activities.
International distribution	Exporting to foreign regions, either directly, through a local importer, or through a third-party distribution arrangement with a foreign operator.

4.3.2.2.12. Payment of distributors

In cases where distribution occurs indirectly, various payment methods can be used for the distribution payment.

Some income arrangements for distributors are listed below

Direct sale	The distributor purchases the item from the business. The distributor then owns the stock that is held for sale. The income to the distributor flows from the difference between the purchase price from the business and the sale price to the customer. This method is used in most retail operations, apart from large items such as equipment.
Agency	Payment flows directly from the customer to the business. The distributor receives a fee or commission which may be a fixed dollar amount, a percentage of the sale amount, or some other arrangement. The distributor does not purchase or own the stock that is held for display. This method is used for third-party distribution arrangements, and for the sale of large items such as equipment
Sale-or-return	This method is used for the sale of magazines, for example. The publisher delivers the magazines to the newsagent for display, at no cost. Any purchased items result in payment to the publisher from the newsagent, while unsold items are returned.

4.3.2.2.13. Product Quality

Quality products are the best form of promotion that a business can have.

A business with quality products may find that sales increase steadily with little promotion or marketing effort.

Distributors may agree to carry the products with little effort, and in some cases a distributor may contact the business and request the right to distribute the products, rather than the opposite situation occurring.

Product quality does not necessarily imply expensive or complex items.

There are separate markets for basic low-cost items and expensive complex items in most product groups.

A product that fills its function well with often attract interest from distributors without extensive efforts from the business.

Extensive marketing and promotion can increase sales.

However, if this is based on products that are not fundamentally attractive to potential customers, then considerable cost and time may be involved for little return.

A business that spends 90% of its resources on product development and 10% on promotion, may find that it is more successful than a business than spends 10% on product development and 90% on promotion.

4.3.3. Distributing third-party products

In additional to performing the usual business activities that the business conducts, the business can also distribute other business's products to its customers and clients.

This can provide additional income for the business, with little input required to conduct the distribution activity.

Simply having a steady stream of customers may be a valuable asset to a business, and provides the opportunity to offer related products or services to customers.

This process generally involves products that have a similar basis to the business's own products.

This ensures that the business will have some knowledge and understanding of the products, and also that the customers are likely to be interested in similar products.

For example, banks often distribute insurance and investment products, while a real estate agency may distribute packaged property services to new property buyers.

In some situations, the distribution activity may become a major source of income for the business, and the business operation itself may become less significant or may even become a loss-making operation.

4.3.4. Entry to markets

In some cases, a business may produce products, advertise, and receive immediate orders from customers.

However, in most cases significant steps need to be taken to establish a presence within a market and to generate a steady stream of sales.

This applies to new businesses, and also to entering markets that a business has not operated in previously.

4.3.4.1. New markets

A market, in the context of business sales, is a type of product or service that is sold in a particular place, or in a particular way.

New markets for the business activity can be established in some of the following circumstances.

- Distributing the existing products or services in new geographic regions.
- Creating new products or services within the framework of the existing business operations.
- Commencing operations in a new industry, or developing products in a different product group from existing operations.

4.3.4.2. Types of market entry

Markets can be entered gradually, or through a major project activity.

Gradual entry

Gradually entry may be an option where the business has stable existing operations.

This may allow new products to be developed and released, or marketing activities to commence in new regions.

Marketing in new regions may produce a low volume of initial sales, which may gradually grow into an established client base or a steady stream of sales.

Project-based entry

In many circumstances, however, gradually entry may not be a practical alternative.

Fixed costs, such as leasing retail space and operating administration activities, may lead to a minimum level of sales being needed to reach a break-even point.

Commencing a small scale operation in these cases may result in significant losses due to the outflow of fixed costs.

Also, large expenses may be required to commence operation.

These may include purchasing a licence to operate within an industry, and the cost of developing products.

In these cases, a minimum level of sales would be required to recover the costs of commencing operations.

A project-based entry approach can be used in situations such as this.

A project-based entry involves a specific project, with the aim of either reaching a sustainable level of sales within a fixed time and within a budget allocation, or abandoning the attempt and withdrawing from the market.

4.3.4.3. Choice of market

The choice of which market to attempt new operations in may be an important issue.

If the market for the products is too small, then the costs of establishing the operation may never be recovered.

However, if the market is too large, then the business capital may be quickly consumed, without creating a sustainable flow of sales.

This situation sometimes occurs in the case of overseas expansion.

A business may operate successfully in an established market.

The business may then attempt to expand into a large overseas market.

However, the costs of advertising, developing customer supply arrangements and leasing facilities may quickly consume the available business capital.

This process often results in the business retreating to the home market, having suffered a major loss in capital.

The risk of this situation occurring can be reduced by carefully selecting the expansion region, such as a single city or part of another country as the target base for operations.

Overseas markets that are close to the local market are often chosen for this.

However, the most suitable region may often be far distant from the base country of operation.

If a business decides to establish an overseas operation, then all possible locations should be considered before a decision is made.

4.3.4.4. Products & services

In order to establish operations in a new market, a business would need to have products or services that had a reasonable chance of success.

These may be products designed and developed internally, or they may be produces sourced from other businesses under a distribution agreement.

The price, quality, available volume and market demand for the product may all be issues that could determine whether a product had a reasonable chance of success.

The existing or planned products should generally be carefully assessed, before any consideration is given to attempting to establish new operations.

If the existing or planned products would not be suitable for the new market, then a product development process may be required before the process of establishing operations could be considered.

If adequate products are available, then a project plan could be developed on the basis of attempting to establish a sustainable level of sales within the new market.

4.3.4.5. Project plans

Attempting to establish operations in a new market may consume a significant part of the business capital.

This applies to both small enterprises and large corporations.

For this reason, the entry attempt should be carefully planned and should involve a detailed project plan.

This may include some of the following points.

Preparation	Steps involved before the major expenses are incurred. This may include researching the market, designing broad product specifications, and conducting initial discussions with possible customers and distributors.
Schedules	A list of all the tasks to be performed, along with timeframes, and cost allocations for each item.
Scenarios	A consideration of each possible outcome, such as low, medium or high sales demand, and plans for the course of action in each case.
Withdrawal	A plan to terminate the establishment attempt unless certain conditions arise, such as the minimum sales volume being achieved within a

	certain period of time, and within the allocated capital cost.
Task details	Descriptions of each task, such as product development, advertising campaigns, limited discount volumes or time periods, and so on.
Costs	Estimates of costs including direct expenses, the cost of subsidies for limited periods, and costs under each scenario of sales.

4.3.4.6. Floating Vs. fixed time horizons

In some cases, establishing a presence in a new market may involve a considerable period of time, and a large number of changes may occur during the process of establishing the operation.

Plans and directions may need to be changed significantly several times before a sustainable operation is finally established.

However, maintaining a perspective on the current situation may be important in reducing the risk of a major loss of capital.

In some cases, a detailed project plan is created before an activity commences.

However, as time passes, both the costs of the activity and the time periods involve may extend to levels that are far larger than the levels that were included in the project plan.

The original project plan may be forgotten, and activities may continue on a loss-making basis until the business capital is consumed.

Although plans and directions may need to be adapted as events unfold, referring back to an original fixed project plan as a reference point may be useful in preventing excessive losses occurring.

This may be particularly important in coming to a decision to terminate an attempt at market entry, and to withdraw from the activity.

A situation may sometimes develop in which each month activities continue with the intention of ceasing attempts in a short period of time.

This situation can continue indefinitely, with a decision never actually being made to cease the loss-making activities.

Although the relevant issues in a business decision generally relate to future possibilities, rather than past events, referring back to a past point of reference may be essential in gaining a clear perspective on the true nature of the current situation, and the nature of the approach that is currently being taken.

This situation could also be described as a floating time horizon, rather than a fixed time horizon.

For example, an approach may be taken that the establishment attempt will be abandoned in two months time if losses are still continuing.

However, a year later, the same attitude may exist, with the approach being that the attempt will be abandoned in two month's time.

Situations such as this may become a permanent feature of the business operation, and may drain cash flow from the business and prevent the business from operating and developing effectively.

When an approach such as this is taken, using diary entries and calendar-based planning may be useful in ensuring that, at a minimum, the decision is carefully reviewed when the particular point in time arrives, rather than being a floating target that is never reached.

Without referring back to a fixed point of reference, activity may continue on a permanent loss-making basis, until the business capital is finally consumed.

4.3.4.7. Preparation

The preparation stage involves a range of activities that could occur before the decision was made to proceed with the project, and before the major expenses are incurred.

This could include some of the following activities.

Researching the market	Researching major competitors, margins and volumes within the industry, and the types of products sold.

Discussions	Conducting preliminary discussions with customers, suppliers and distributors, to determine the demand for new products, the likely margins and cost structures, and the likelihood of the market being closed to new operations.
Product designs	Developing broad basic product designs, including costs, volumes, and the type and description of the products.
Facilities design	Planning the leasing, buying or building of facilities, and the costs and time involved in each situation.

4.3.4.8. Capital

A market entry attempt that would have a major impact on the business is also likely to consume a significant portion of the business's capital.

A fixed capital allocation should be made for the establishment attempt, with the operations withdrawn if a break-even sales level is not achieved within the budget.

A staged project may be used to reduce the risk of a major loss due to a failed entry attempt.

This may involve a complete market commencement project, based on a small volume of sales.

This may involve a small facility, operating within a limited region.

If this first stage was successful, then a larger project could be conducted to create larger facilities to produce the full planned volume of production.

This approach is known as a "pilot project", and is common in manufacturing operations, and in the development of new television series.

4.3.4.9. Scenarios

When the project is implemented, a number of results may occur.

These may include

- Blockages due to government regulation.
- Blockages due to established agreements between suppliers and customers.
- Low sales volume.
- Moderate sales volume.
- High sales demand.

Each scenario should include a set of planned actions following this result.

All possible scenarios cannot be considered, as a wide range of unexpected events may occur.

However, some consideration of the possible actions that could be taken in each situation may be an important part of developing the project plan.

For example, although strong sales demand would be a positive outcome, in some cases this may lead to a failure of the market entry attempt.

This can occur when the business cannot meet the level of requested sales, long delays occur, and the product looses favour in the market.

The risk of this situation occurring could be reduced by arranging stand-by temporary facilities for higher volume production as part of the project plan.

In many cases this level of detail may be excessive, however some early consideration of the possibilities may affect the broad framework of the project development.

4.3.4.10. Methods of market entry

A number of approaches can be taken to producing products or services for sale within a new market.

These include developing new distribution channels and customer regions, commencing operations using a start-up approach, and buying an existing business.

4.3.4.10.1. Expanding distribution

Expanding distribution includes developing new distribution channels, and marketing to a new region or group of potential customers.

This process is generally suitable for gradual entry to a new market, and is a relatively low-cost alternative for entering new markets.

Distribution channels could involve third-party distribution agreements with other businesses, and supplying products to overseas importers or major retail chains.

4.3.4.10.2. Commencing operations

Commencing operations is a similar process to a standard business start-up activity.

For example, a bakery may commence operations in another region.

Simply transporting the products from the existing facility would not be a practical alternative, as the goods would need to be produced at the point of sale.

Establishing a new operation may involve leasing premises, purchasing equipment and stock, and commencing operations.

Similar issues arise in service industries, where an overseas operation would need to have on-site staff to perform services for clients.

Commencing operations is a lower-risk alternative than a start-up operation of a completely new business.

Also, no accounting goodwill cost is involved, which may occur in the case of purchasing an existing business.

However, a significant capital cost may be involved, and sales volumes may not develop for a period of time.

This approach is particularly suitable for businesses that service a limited region around the business operation.

4.3.4.10.3. Buying a business

Buying another business is a common form of market entry in the case of large enterprises.

Entry to a new market is one of the most common reasons that large businesses are purchased.

A disadvantage with this method is that a goodwill cost may be involved.

This is the additional cost required to purchase the business, above the value of the net assets.

However, this method has a number of advantages.

Sales volume occurs immediately, and this is a low-risk approach to commencing operations in a new market.

Also, problems with closed markets do not apply.

This is particularly relevant to licences, where a small number of available licences to operate may be tightly held by several organisations.

Television broadcasting is an example of this.

Entry to the television broadcasting industry is only possible at a practical level though buying an existing broadcaster.

The issue of closed markets also arises when the links between suppliers and customers are tied up in long-term agreements.

This approach may also be relevant to industries that operate with significant economies of scale, where the industry may be consolidated into a few large organisations.

In these situations, commencing a small operation and gradually expanding may not be a practical alternative.

In this case, either buying an existing business, or a large start-up activity involving constructing high-capacity facilities may be needed to commence operations within the new market.

Once a business has been purchased, several alternatives are available.

These may include:

- Maintaining the business as an independent operation.
- Integrating the business with existing operations.
- Conducting a partial integration, to achieve economies of scale with services such as computer facilities.
- Using the new business as a distribution channel for the business's products.

4.3.4.10.4. Technology & innovation

There can be significant inertia involved in changes to business operations.

Commencing purchases from a new supplier, for example, may involve setting up accounts, negotiating contracts, establishing regular procedures, and so on.

For this reason, customers would normally not change from an established supplier to a new supplier that offered the same products at the same prices as the existing supplier.

Also, many industries are highly competitive, and prices settle at the lowest sustainable level.

In these cases, it may be very difficult for a new business to offer products at substantially lower prices than existing suppliers.

One solution to this problem may involve the use of technology and product innovation.

This may involve developing new technology in-house, or licensing technology from another business.

This second situation particularly applies to technology that is used in another region but is not currently used within the region that is serviced by the business.

Technology could include computer systems for managing production, manufacturing processes that allow a product to be created more efficiently, and patented systems that can be included as part of the product itself.

Product innovation is a related issue.

Although there can be considerable inertia in changing business arrangements, there can also be considerable inertia in updating product designs.

In many cases the products that are sold within an industry may have changed little for many years, or in some cases for decades.

In other cases, many changes may have been made, however the designs may still be based on a structure from the distant past that is not really suitable for the current uses of the products.

This situation may provide a business with the opportunity to develop new and innovative products that may attract interest from customers.

4.3.4.10.5. Purchasing a licence

In some industries, a licence is required before a business can operate within the industry.

The cost of the licence becomes a capital cost required to commence operations within the industry.

Licences fall into two categories.

The number of licences may be restricted, or it may be unrestricted.

In the case of unrestricted licences, the business must meet certain criteria before it may operate within the industry.

Banking is an example of this.

There is generally no restriction placed on the number of banks that may operate within an economy.

However, a banking licence must be issued by the central bank before a business is permitted to perform banking services.

Specifically, this relates to accepting deposits from the general public.

Any business can generally offer loans, as in this case the risk lies with the business, not the customer.

A business must meet certain requirements before a banking licence will be granted, such as a minimum level of shareholder's capital to act as a buffer against bad debts, and segregation of the banking activities from other business activities.

Restricted licenses may be due to physical restrictions, such as the allocation of radio frequencies for broadcasting, or the terminals at a sea port or airport.

In other cases a limited number of licences may be issued for other reasons, such as limiting the number of facilities that may be created.

Taxi licences are sometimes restricted in this way.

Licences create a barrier to entry.

This may present a significant problem to a business that wishes to establish operations within a new industry.

Within these industries, purchasing a licence to operate may be a major method of market entry, and in fact may be a requirement of commencing operations.

In cases where a large number of licences are issued, an active market in buying and selling licences will generally exist.

In the case of a small number of licences, in practice another business may need to be purchased in order to gain a licence to operate within the industry.

Licences also create a barrier to exit.

A business cannot generally move gradually into another industry when profitability levels fall within a licensed industry.

In general a major business change must be made to enter or exit an industry in these cases.

In practice, profitability within closed industries if often low, and it is not uncommon for a business to become insolvent and to cease operations within an industry that has restricted licenses.

This is due to the fact that the existing businesses within the industry have no option for expansion, other than increasing market share from the other businesses within the industry.

4.3.4.11. Establishment approaches

4.3.4.11.1. Advertising & Promotion campaigns

In markets that involve sales to the general public, advertising and promotional campaigns may be used.

This could include advertisements on television, radio, billboards, and within magazines or newspapers.

Advertising can be expensive, and in general the advertising effort should be concentrated to within a small enough region to have a practical impact, while also covering a large enough region to generate sales volumes.

Promotion campaigns may include providing free samples and demonstrations, distributing marketing material and product information, and appearing at events such as activities that are related to the type of product being promoted.

Most tasks involved in a project launch are determined in advance, and the cost is then determined for each item.

For example, facilities may have to be built, leased or purchased to enable the product to be manufactured in the planned volumes.

However, in the case of advertising and promotion, the opposite situation applies.

In these cases, an arbitrary amount is allocated for this purpose, and then the funds are spent in the most effective way for the particular type of product.

For example, the business may determine the total fixed costs, and then decide to allocate an equal amount for advertising and promotion, to determine the total cost of the project.

Advertising is expensive.

Large product launches may involve many millions of dollars in advertising costs.

In the case of small enterprises, advertising may also be a significant expense, and the advertising budget generally needs to be spent in the most effective way in order to generate sales of the business's products or services.

4.3.4.11.2. Loss leaders

A loss leader is a product that is sold for below the cost of production.

The aim in this case is to establish a market presence and possibly an existing client base, which may then flow through to a sustainable level of sales.

The loss incurred on the sale of the items would be allocated as a cost within the project budget.

This can be a significant expense.

In some competitive markets, businesses spend a significant portion of their capital on selling products at below cost, in attempts to establish a sustainable market position.

4.3.4.11.3. Direct contract

In cases where a product or service is sold to a small number of customers, direct contact from the business may be used.

This may involve requesting an opportunity to conduct a presentation, and provide sample products and product information.

Initial supplies may occur on a trial basis, with larger sales volumes occurring as time when by.

4.3.5. Advertising and brand profile

Advertising can be used to promote products, services, and specific events such as a limited discount period.

Advertising can also be used in raising the general profile of brand names.

For example, Coca Cola is arguably the most famous brand name in the world.

The brand name of Coke has been valued in the billion dollar range (** check figures).

This is simply the value that is placed on the public profile of the brand, it does not involve any assets or production of the company.

For example, Coke is very well known, and if this brand is placed on a shelf beside a similar plain label cola brand, a much larger volume of Coke would be purchased than the similar plain label brand.

The profile of Coke is maintained through constant high-profile advertising.

Should this advertising cease, it would be likely that Coke would gradually fall from favour over a period of many years.

Some brand names have a limited life span and their profile expires after a period of time.

Although they are not brand names, the profile of film and music releases falls into this category.

In other cases, a brand name may be maintained indefinitely through continuous advertising and promotion.

However, according to some schools of thought, a brand name cannot be resurrected once it has lapsed and fallen from favour.

Brand profile is a significant issue in commodity products that are purchased by the general public.

This includes products and services which occur in large volumes, and where a range of similar items are available from different suppliers.

Banking is an example of this situation.

In many cases, banking services do not vary greatly from one bank to another, and the brand profile of a bank is a significant issue in attracting and retaining customers.

In contrast, brand names may not be a significant issue in wholesale markets, and in large scale transactions.

4.3.6. Target Markets

A target market involves a group of customers that are likely to purchase a product.

This may be an issue in designing and developing a product, and also in marketing and distribution.

For example, retirement income products would only be purchased by retirees, while teenage fashion would only be purchased by teenagers.

Farm equipment would only be purchased in rural areas, and there would be little point in advertising farm equipment in urban areas.

Target marketing involves directing the marketing efforts towards the group of potential customers that are most likely to purchase the product.

Identifying this group is the first step in the process.

In some cases the target market may be obvious, as in the previous examples.

In other cases, reviewing the current customer profile may produce surprising results, with the customers who are actually purchasing the product being quite different from the customers that the product was designed for, or the customers that may have been expected.

One approach is to review the information available about existing customers.

For example, in the case of on-going services, a considerable amount of information may be stored about each customer.

In other cases, little information may be available.

In the case of cash sales at retail outlets, for example, little may be known about the customer profile.

In these cases, surveys of a random sample of customers may be conducted.

In other cases, samples of a potential new product may be created and surveys of the general public could be conducted.

Market research agencies organise and conduct research about customer perceptions of existing products, products within certain categories, and reactions to samples of potential new products.

A target market may be identified as part of the product design and business development strategy, or it may be identified from the profile of existing customers.

Having identified the target market, promotion can then targeted in that direction.

This may involve advertising in certain magazines or television programs, arranging links with various associations, and arranging third-party distribution agreements with businesses that provide services to a similar range of people.

Market research agencies maintain mailing lists of potential customers based on a wide range of different profiles.

4.3.7. Tenders

In some business operations, a small number of large transactions are involved.

This occurs, for example, in commercial construction, contract services, and computer software development.

In these situations, selecting a supplier by tender is a common arrangement.

Selecting parties my tender is used in the following circumstances.

- Project developments, such as construction.
- Service contracts, such as maintenance or administration services.

- Supply contracts, including regular supplies of commodities such as raw materials or machinery parts.

- The sale of large assets, including businesses, properties, and infrastructure such as airports.

Tenders may be invited for continuous arrangements, such as contract services, or for specific projects, such as a commercial building construction.

This process begins with the customer posting an announcement that tenders are invited to complete a project or provide a service.

Businesses could then submit a request for information, which would generally involve detailed information being supplied by the customer.

This may include some of the following information.

- A description of the project or service.

- Basic specifications and time frames.

- Requirements such as volumes of supply.

- Possibly a range of expected prices as an indication of the level of service that was requested for submitted tenders.

In some cases tender information may be highly detailed, and may effectively form one-half of the potential contract with the developer or supplier.

In other cases, the tender information may broadly outline a project, with the detailed negotiations and project design to be conducted at a later date.

After reviewing the tender information, the business may then prepare a submission.

Some of the details that may be included in a tender submission could include the following

- Details of fees charged for each service or each stage of the project.

- Details of payment arrangements, such as progress payments.

- Points that were specified in the tender request that are not included as part of the proposal.

- Additional services offered with the submission.

- Proposed time frames for the project, if this was not specified in the original specification.

- Information supporting the business's ability to complete the project, such as capital backing, equipment and staff arrangements.

- Information supporting the business's ability to complete the project according to the schedule, within budget and to quality standards, such as client or independent reviews of previous projects.

In the case of complex development projects, several months work could be involved in preparing a tender submission.

A major issue in selecting a tender may be the strength of the case supporting the business's ability to complete the project effectively.

Price does not become relevant until after the case has been established that the business has the capacity to effectively complete the project or supply the products.

A short-list of tenders may be created, based on the submissions that offer to complete the project according to specification, and where the tendering business appears likely to complete the project if the tender is selected.

After the short list has been selected, price may become a major issue.

In the case of standardised products and services, price may become the major factor.

For example, this could include some of the following:

- Scheduled maintenance according to manufacturer's specifications.

- Commodity products such as agricultural products of specified grades, machinery parts, computer hardware devices and so on.

In other cases, price may be less significant, and the full range of information within a tender submission may be relevant to the final decision.

This may particularly occur when the project involves considerable risk, and the ability of the business to complete the project effectively may be significant.

Also, price may be of less direct significance in large and complex projects, and in service contracts involving tasks such as project management, where the service offered may differ significantly from one business to another.

Tendering is a competitive process, and a careful consideration of the likely submissions of other parties may be necessary in order to select pricing levels, highlight strengths, and address weaknesses in the proposal through actions such as arranging facilities from other suppliers that the business is not able to supply directly.

4.3.8. Product proposals

Proposals to potential clients may follow a similar pattern to tender submissions, on a smaller scale.

A written proposal submitted to a potential client may include some of the following information:

- A description of the product.
- Technical details and specifications.
- Basic information about the business.
- Details of the business's ability to supply the product in sufficient volumes on a reliable basis.
- Performance details of the product.
- Pricing details.

A presentation combining a written submission with a verbal presentation may be more successful than simply submitting a written proposal.

This may particularly apply when the proposal is initiated by the business, rather than being a response to a request for information from a potential customer.

In many cases, written proposals that are submitted for consideration may never be read.

4.3.9. Marketing material

Marketing material can include brochures, detailed product guides, written technical information, and video presentations.

In situations where a small number of clients or customers were involved, marketing information may also be written specifically for the client.

In these cases, a set of standard information may be produced about the product, including a description of the product, specifications, and performance results.

Submissions to a potential client may include the standard marketing material, together with information on pricing, volumes, recent information, and customisation of the product to suit the particular client.

In the case of retail distribution to the general public, marketing material may be distributed through retail outlets, by direct mail, and through other businesses under a third-party distribution arrangement.

When a third-party distribution arrangement is used, supporting marketing material such as brochures is generally supplied by the business as part of the distribution arrangement.

4.3.10. Customer perceptions & preferences

The importance of customer perceptions can be illustrated using the story of "cloudy ammonia"

Ammonia is distributed in a diluted bottled form for use as a household disinfectant.

Production of household ammonia in the distant past involved a process that produced a product that contained a number of impurities.

These impurities gave the product a milky appearance, even through ammonia itself is clear.

New manufacturing processes where developed that resulted in a higher quality product with less impurities.

However, the new product was clear of impurities and was transparent in a similar way to bottled water.

Sales of the new product were low, as consumers assumed that the new product was less concentrated, due to its less milky appearance.

This problem was eventually addressed by adding artificial impurities to the liquid, to give it a milky appearance.

This product is known as “cloudy ammonia”.

This situation developed in the 1920’s (**check decade), and “cloudy ammonia” is still sold today by a number of different manufacturers.

There are several lessons from this story for the marketing operations of a business.

First, the appearance of a product is just as important as its substance or functions.

Some products have the most unlikely appearance but become legendary for a particular function.

However, this is rare, and in the reality of general business operations, the appearance and customer perceptions of a product may have a large impact on sales.

Also, a product or service that is different from existing items may have slow sales initially, until customers become aware of the benefits of the product or service.

4.3.11. Marketing Approaches

4.3.11.1. Multiple brand names

Many businesses offer several separate brands.

These may be completely independent activities, which each brand having separate products, cost structures and marketing activities.

In other cases, a product is re-packaged under separate brand names and a single product is sold under multiple brands.

There may be several potential benefits with offering multiple brands.

Specific customer groups

In some cases, brands and product lines are aimed at a particular consumer group, such as a particular age range.

Maintaining several separate brands may allow a business to operate activities within several separate markets.

Internal costs, such as manufacturing facilities, could then be spread across a larger number of items, resulting in lower costs per unit.

Target market demand

In some cases, there may be distinct market demands for different levels of service or product features.

Multiple brands are sometimes used in these cases.

For example, a stockbroking operation may offer a full service operation that included investment advice, and also offer a lower cost service under a separate brand that only provided direct trading facilities.

Brand names Vs. Production

In many cases, there may be a separation between the brand name and marketing activities, and the manufacturing process.

A business may own brand names but not manufacturing facilities.

In this case, an external manufacturer may be used to produce the products on a contract basis, based on standard products, or designs supplied by the business.

In other cases a business may operate manufacturing facilities on a wholesale basis but not own brand names.

This may involve selling standard products in wholesale markets, or performing contract manufacturing for other businesses.

In some cases, a business may operate manufacturing facilities in-house, and also manage brand names and conduct marketing activities.

Cannibalisation of sales

A disadvantage of multiple brand names may involve the risk of cannibalisation of existing sales.

This can occur when a new low-cost service is established, and sales from existing services are lost to the new service, resulting in a reduction in profit rather than an increase.

Cannibalisation is a potential problem for existing business establishing a low-cost discount product or services.

However, the new products and the existing products can each be viewed as independent markets.

New products are usually offered when there is a market demand for the product or service, and competing businesses may also be offering a product or service of a similar type.

In these cases, a certain proportion of customers will be lost in any event, either to the new operation, or to similar operations of competing businesses.

Cannibalisation may be a significant issue in preventing new products from being launched by large organisations.

Sales of the new product may reduce sales of existing products, and this may lead to the new product failing to be launched.

However, each of these areas may best be viewed independently.

If a business fails to launch a potentially successful product or service due to the effect that it may have on other products, this may harm the business overall.

Each product should rise or fall on its own merits.

Any attempt to artificially alter this by direct intervention, may result in a cost to the business, rather than a benefit.

4.3.11.2. Multiple versions

Multiple versions of products can be offered in situations where the product is an abstract design.

This may include offering basic versions of the product at lower prices than the full version, or altered versions of the product for specific purposes.

This may enable a larger number of items of the product itself to be sold, by offering the product in different segments of the market.

Films are one example.

A completed film could be distributed as it stood.

Also, subtitles or voice dubbing could be added to allow the film to be distributed in foreign countries, where different languages were used.

Sections of the film could also be used in music video clips, for advertising purposes and so on.

In other cases, a basic design is adapted into several different types of product.

For example, a complete structural design of a new car may be adapted for 2-door, 4-door and convertible versions.

In many cases, a large capital cost is involved in developing a design, and these alternatives may allow a larger number of sales to be generated from the results of the development.

4.3.12. Market & Competitor analysis

A business should generally be aware of customers' interests in products, and be aware of the products and operations of competitors.

This particularly applies within fashion-conscious industries.

Clothing is one obvious example.

However, fashion also applies in music, film, and a range of industries that are traditionally considered to be serious or conservative.

In many cases, certain types of products may become fashionable or unfashionable from time to time, resulting in large sales of fashionable products and few sales of unpopular products.

Public companies publish annual reports and audited financial statements, which are lodged with government regulators, stock exchanges, and issued to the general public.

Although this information appears in a summary format, basic details such as margins can be calculated.

Also, averages within industries for figures such as margins and depreciation rates are compiled and published by various parties such as stock exchanges and government departments.

Comparing the business's figures against other figures may highlight potential problems.

For example, if margins are lower than typical industry levels, then the business may be experiencing operational problems, and attention may need to be focused in this area.

Conversely, if margins are solid, operations may be effective, and efforts may be concentrated on product development and marketing activities.

Industry margins are particularly relevant in the case of start-up operations.

In this situation, industry margins can be used as an input into planning the financial structure of the business, and estimating figures such as the capital required, the expected period of negative cash flow, sale prices and so on.

However, excessive focus on either customer's interests or competitor's activities should generally be avoided.

Customers may request certain types of product, and yet when the product is produced, sales may be slow.

Also, new ideas and products must generally come from within the business and be presented to potential customers.

Excessive focus on customers may prevent the business from developing new and independent ideas, that may meet with surprise but high levels of interest from potential customers.

Also, although a general awareness of competitor's products and operations may be useful in determining future directions of the business, a business should generally avoid making decisions specifically based on competitor's actions.

When this occurs, a cycle of action and reaction may occur, with decisions being made on the basis of a competitor's latest action, rather than the general development of the business.

A price war is an example of this situation.

In a price war, one major business lowers prices in order to increase market share.

Competitors may then respond by also reducing prices, and a sustained period of lower profitability follows, with a transfer of value from the entire industry to the customer occurring.

Also, comparing the business to competitors may create a range of unconscious structures and benchmarks that may limit the ability of the business to develop and evolve in effective directions.

Business is a competitive activity, and in some situations direct competition with other businesses occurs.

Submitting tenders for projects and service contracts is an example of a competitive situation.

However, many successful products and businesses are derived from completely ignoring customers and competitors, and developed products and business structures that are effective in their own right.

When this is done, strong sales may occur and the business may develop successfully, regardless of the different paths taken by various competitors.

As a general rule, decisions may be made considering the following three issues, in descending order of priority.

1. The nature of the product and the business itself.

2. The interests and demands of customers.

3. The actions and products of competitors.

4.4. Product design & development

Product design may involve issues related to the actual design of an item or service, in addition to issues such as pricing of the product, the target market, and the methods used for producing and distributing the product.

4.4.1. Physical design

In the case of manufacturing, an engineering design process may be involved in creating the physical design of a new product.

This may range from a small activity that may be completed in a short period of time, up to product design projects such as the design of a large new aircraft.

In this second case, the design process may continue for a decade, and involve large sums of capital, thousands of hours of testing and complex computer simulations.

The physical design may consider the costs and properties of different materials, the stresses within the physical structure, and tolerances to pressure, temperature and so on.

The design process may involve designing a structure based on engineering calculations, with the aid of computer processing to perform calculations and display draft designs.

Physical models and computer simulations may then be used to test the performance of the product under different physical conditions.

In some cases, a large amount of testing and development of prototypes may also be involved.

In addition to the engineering design, some products have a graphic design component for their physical form, structure and appearance.

The graphic design may also pass through many stages before a final design is chosen.

4.4.1.1. Prototypes

Models and prototypes may be developed for demonstration to potential customers, and for testing purposes.

For example, wind-tunnel testing of prototype aircraft may be conducted, while a wide range of testing may be performed on prototypes of various products.

4.4.1.2. Simulations

Engineering and construction design may use computer modelling and simulations in the design process.

This may include computer aided drafting and design systems, which may enable architectural and construction engineering plans to be designed and recorded.

In the case of simulations, the performance of products in various physical conditions, and the internal operations and efficiency of products may be simulated using computer models and processes.

4.4.1.3. Contact engineering

Physical design of products may be preformed internally by the business.

Alternatively, contract engineering services may be used to complete parts of the design process, or to produce a complete design according to requirements that were specified by the business.

4.4.1.4. Complexity, costs & reliability

The complexity of a physical product design may have a considerable impact on the cost of production, the performance of the product, and the reliability of the product operation.

A simple product design may have some of the following benefits in comparison to a product design that may involve many parts and complex operations.

- More reliable operation.
- Lower costs for materials, production facilities, and production expenses.
- The ability to produce a larger number of items within a period of time from a production facility.

In some cases, a product that may have high performance and allow efficient operation may involve a complex design.

However, all else being equal, a simple design may have a range of benefits in comparison to a product that is poorly designed through using a large number of parts to perform functions that could be performed using a much simpler design.

A large component of a design process may involve reducing a range of complex functions down to a set of simple operations that can be performed using a simple design.

Increasing the performance of a product may involve refining the design of existing components of a product, rather than adding additional parts.

Simplicity may be a strength of a physical design in many circumstances, and a simple design that has been subject to extensive refinement may result in a more efficient and reliable product that a design that is based on a large number of parts.

Adding more parts and complex operations may improve product performance in some cases, with a possible disadvantage of higher costs and less reliable operation.

In other cases, adding parts and complex operations may reduce the performance of a product.

In some cases, the strength and quality of a design may be determined by the amount of design effort that has been spent in distilling a range of complex functions into a simple structure that is able to perform the full range of functions of the product.

4.4.1.5. Manufacturing costs & difficulty

In designing a physical product design, a number of issues may be considered.

These may include the performance of the product, the product size and weight, and the cost of the materials that may be required to produce the product.

However, the design of a product may also have a large impact on the costs and difficulty of manufacturing the product.

In some cases, a minor change to a product design may lead to the manufacturing process becoming considerably simpler.

In other cases, a minor feature or element of the physical structure may lead to the manufacturing process becoming particularly difficult.

In these cases, the design may impact on the equipment that may be required to produce the product, the volume of products that may be produced within a period of time, and the cost of the manufacturing process itself.

In creating a product design, the cost and complexity of the manufacturing process may considered as a significant issue in selecting the form and structure of the design.

4.4.1.6. Testing produce performance

Testing the performance of a product may be an essential element of an effective design process.

In general, a design may only be improved through testing the performance of the product, and altering the design of the product to improve the product performance.

Without testing the results of a product or operation, the process or design itself may not be able to be improved.

This may involve engineering testing of prototypes, computer simulations, and field testing of products under conditions of actual usage.

In other situations, considering comments from customers and customer response to various products may enable the business to develop more effective products and processes.

4.4.2. Product development projects

A new product may be developed over time as part of the ongoing business operation, or it may be developed as a specific project.

In the case of a project development, this may involve the standard project steps of developing the basic project goals and plan, performing a detailed assessment, developing schedules and managing the project through to completion.

In the case of a product design, tasks and timeframes may relate to major steps rather than detailed individual tasks.

For example, the project may include a period for initial discussions with potential clients, a period for creating basic designs and possible approaches, a review period and a test-marketing stage, followed by the detailed design of the product, and finally arranging production facilities and contract agreements.

Product design may differ from other projects such as construction, in there may be several points in the process at which a decision may be made to either continue to the next stage, or to withdraw from the product design due to the product being impractical or not meeting a demand within a market.

4.4.3. Product designs

4.4.3.1. Market leading designs

Products designs may be based on changing fashions and demand for products within the market for the products.

In other cases, new ideas for products may come from within the business.

In the case of market leading designs, new products may be met with surprise from the potential customer base and from competitors.

Market leading designs may provide a range of benefits to the business activity.

A strong period of sales may be generated in the case of a successful product.

Also, solid prices and margins may be able to be maintained for a period of time, until competitors release products that have similar structures or perform similar functions to the new product.

In the case of technology that can be patented, a new design may enable the business to maintain solid margins over a medium term time frame.

However, although proprietary technology developments may be useful in maintaining long term margins, alternatives to the technology may be released over time, and in the long term the technology may be superseded by improved techniques or processes.

4.4.3.2. Market response designs

A market response design may involve producing a product in response to a strong demand from within a market.

As with a market leading design, a market response design may also result in a strong period of sales.

This approach may be suitable for industries which may be highly fashion-conscious, with particular types of product becoming popular or unpopular as time goes by.

In addition to industries such as fashion and film, a number of industries that may be traditionally considered conservative or serious may also have an element of fashion involved in the demand for particular types of product.

This approach may also be suitable in cases such as new industries in which new products may be needed, or in cases where a particular product or services may not be available within a particular area.

A market response design may have an advantage in that the required design may be determined though investigating the customer interest in various types of product.

In contrast, in the case of a market leading design, greater extremes of outcome may be possible, with a new product being either highly successful, or a complete failure.

4.4.3.3. Customised products vs. standard sets

Some business operations may involve a standard set of product designs, which may be produced in large volumes.

Product designs may be updated on a regular basis, and replaced with completely new designs over longer time frames.

In other cases, products may be developed specifically to client orders.

This may include designs that may be provided by clients, or it may involve a customer selecting from a range of options that may be available for a product.

In some cases, a manufacturer may produce a set of standard products, and may also produce limited designs, products based on customer selections, and products based on customer designs.

4.4.3.4. Packaged services

Product design and development may be a significant issue in manufacturing and other production activities.

However, this issue may also apply to some service operations.

For example, “packaged services” may involve combining several services into a single package, in return for a single fee.

This may provide convenience for the customer.

Also, this approach may be particularly beneficial when the packaging arrangement is used to create an additional facility, rather than simply bundling several products together as a marketing activity.

This may occur when the operation of the package could not be duplicated by purchasing the individual items separately.

For example, in the case of a structured financial transaction, a debt facility and an asset may be combined into a single product.

In this way, the cash flow from the asset may be automatically re-directed to the debt, which may reduce the risk of the debt facility and allow lower interest rates to be charged.

This arrangement may not be possible if each component of the package was purchased separately.

Packaged services may include products or services that are provided by other businesses, as well as the business itself.

Using this approach, a business may be able to create a product that may have considerable appeal for a customer, using services of the business itself, and components sourced from other businesses.

4.4.3.5. Orthogonal options

“Orthogonal” product options or product functions may involve situations in which several options or functions may be selected independently.

For example, a machine may have settings for three different operating parameters.

These may be described in the following list.

Parameter A	option A, B or C
Parameter B	option A, B
Parameter C	option A, B or C

The functions of this machine may be selected in various ways.

A list selection may involve the following possible operating modes.

	Parameter A	Parameter B	Parameter C
Mode 1	C	B	A
Mode 2	A	A	B
Mode 3	B	B	C

In the list arrangement, the possible selections may be chosen from a list of combinations.

In this example, three operating modes are available, involving various settings of the three machine parameters.

In an orthogonal selection arrangement, each parameter may be selected individually, rather than a fixed list of options being provided.

For example, in this case the following possible combinations of the parameter settings may be selected.

Parameter A	Parameter B	Parameter C
A	A	A
A	A	B
A	A	C
A	B	A
A	B	B
A	B	C
B	A	A
B	A	B
B	A	C
B	B	A
B	B	B
B	B	C
C	A	A
C	A	B
C	A	C
C	B	A
C	B	B
C	B	C

In the case of the orthogonal selection, the machine may know be used in 18 different ways, rather than the three different ways from the case in which the operating modes were selected from a predefined list.

By using individual selection of each function, the number of ways in which the machine may be used may be increased in this example from three to 18, without altering the design of the machine.

In the case of orthogonal selection, the number of possible combinations of options may be calculated using the following approach.

combinations = the number of options for each parameter, multiplied together

In the previous example, there were three alternatives for the first option, two alternatives for the second option, and three alternatives for the third option.

The number of combinations may then be calculated using the following example.

$$\text{combinations} = 3 \times 2 \times 3$$

$$= 18$$

This concept may apply to a range of business situations.

In the case of physical product designs, creating products in which each function is selected separately may result in the development of products that are flexible and perform a wider range of functions.

In contrast, operating equipment through selecting pre-defined combinations may result in fewer facilities being available than if each parameter was selected individually.

In the case of options that may be selected by a customer for a service or a physical product, a similar situation may apply.

In this case, allowing the customer to make a selection for each component of the package separately, rather than selecting from several pre-defined

combinations, may allow a larger number of product combinations to be offered, and may result in increased sales.

4.4.4. Business issues

In addition to physical design or creating a service design, various business issues may also be involved as part of the overall design of a product.

4.4.4.1. Volumes, margins & pricing

4.4.4.1.1. Volumes

Target volumes of production may be considered in designing a product, and in selecting pricing levels, production facilities and so on.

In the case of commodity producers, for example, very large volumes may be necessary in order to operate a sustainable businesses operation.

At the other extreme, specialty, customised and hand-made items may involve low volumes, with margins possibly being higher than in the case of high-volume production.

4.4.4.1.2. Cost structures & pricing

The costs of various stages of the product creation and distribution may also be considered when designing a product.

This may involve costs such as materials, production facilities, staff costs, business premises, and distribution arrangements.

4.4.4.1.3. Margins

In general there may be a trade-off between volumes and margins.

High volume items may be offered at low prices and with low margins, while low volume production may need to be offered for sale at higher prices and margins, in order to cover fixed costs and maintain profitability.

The choice of target margins and sales volumes may be a major issue in the design of a product.

The decision to purchase a product is made by the customer, not the business.

Demand for the product may vary from one customer to another.

The business may chose the selling price and margin, and the market may respond by delivering a certain volume of sales.

If the business selects a high margin, a low volume of sales may result, as only a small number of customers with a strong interest in the product may chose to purchase the item.

Conversely, if the business selects a low margin, strong sales may result, due to the low price of the product.

The balance of margins and volumes may be determined by the price levels of similar products.

In some cases, high-margin specialty items and low-margin basic items may be produced and marketed as separate product lines, with separate markets existing for each type of product.

4.4.4.2. Fee structures

Fees may be charged for products and services in a variety of ways.

The fee structure of a product may be a major component of the product design.

In the case of a manufactured item, this may involve simply setting the wholesale sale price.

However, changing this value may completely alter the design of the product, from the size and features of the product, to its construction method, choice of production facilities, and planned volumes of production.

In the case of services, fees may be charged in a wide variety of ways.

This may include some of the following alternatives.

- A fixed fee for a specific service.
- An on-going regular fee.
- A regular usage fee based on the amount of usage of a service, or the volume of a product delivered or used.
- A percentage fee based on the size of a transaction.
- An hourly rate or other time-based fee.
- A proportion of the service outcome, such as a percentage of a successful court action, or a percentage of the customer's sales, in cases such as sub-leased retail space.

In the case of distribution arrangements, fee structures may include some of the following possible alternatives.

- A percentage commission based on the value of the transaction.
- A fixed dollar commission for each transaction.
- On-going regular commissions, such as a monthly fee or a percentage fee, in return for arranging an on-going service agreement such as a property management service or investment management service.

4.4.4.3. Distribution

A distribution arrangement may need to be considered as part of a product design.

This may involve sales to wholesalers, retailers, the direct public, distribution through third-party arrangements with other businesses, or other arrangements.

4.4.4.4. Bundled & Unbundled products

Bundled and multi-function products

Bundled products may involve a number of different features within a single product.

This arrangement may be used in service businesses, where a single fee may cover an agreement that may include a range of different services.

A similar concept may apply in the case of certain items of equipment, which may perform several different functions within a single machine.

Bundled products may increase the sales volume of certain items, such as including items with a product that may involve a benefit, but which may not normally be purchased as a completely separate product.

In some cases this arrangement may reduce some administration costs by combining several operations into a single transaction.

By increasing volumes, a low price may be offered for the combined package, which may also attract increased sales.

Bundled products may also include products or services that may be supplied by other businesses.

This may attract sales where the product may meet a demand in the market, particularly where there may be an essential part of the product that the business may not produce directly.

The business may pay a fee to the other business for the right to include an external product or service within the package, they may receive a fee as a distributor, or the arrangement may be on a no-fee basis, on the basis that the package may increase the sales of both individual items.

However, there are may be several disadvantages with a bundled product.

A customer in this case must pay to purchase all of the items within the product.

If there were several items that the customer did not want, then this may reduce sales as the customer may select alternative products for the components that they wished to purchase.

Also, bundled products may be complex in structure.

This may result in more complex manufacturing processes for multiple function equipment than for single-function products, which may increase costs and reduce volume capacity.

This may also be a disincentive to customers who may prefer products which perform a single function or operation.

Bundled service products may be more complex to administer than single purpose products, and this may lead to higher administration and computer software costs, and more complex internal reporting and profitability analysis.

Bundled products were widely used in the earlier days of insurance, where a single product may include life insurance, investment, a savings plan, and a loan arrangement for temporary withdrawals.

Unbundled and single-function products

Unbundled products are products in which each product provides a single feature or operation.

This may allow the customer to select which products they wish to purchase, and in which combinations.

Unbundled products may be simpler than bundled products, which may lead to lower costs of administration and systems requirements, simpler analysis and reporting, and higher volumes.

A product line that included several high-volume unbundled products that could be combined in various ways may involve with lower costs and a higher volume capacity that the a system that involved more complex products.

However, the choice of product design may be determined by the market demand for different types of product, and the products offered by competitors.

4.4.5. Test marketing

Test marketing may involve producing samples, designs and service descriptions, and approaching potential customers to gauge the level of interest in the product.

In the case of a long and expensive design process, this process may be done at several points through the project, to ensure that the concept and design that was being developed may lead to a successful product being created.

4.4.6. Production

Production of a completed product may be handled in a number of ways.

Existing production facilities and operations could be used, or new facilities could be created.

The design itself could be licensed to external manufactures.

Alternatively, the business may arrange for third parties to perform the production on a contract basis.

Production may be managed by the business itself, by a specialist production management business, or produced by an external manufacturer under a contract arrangement.

4.5. Business infrastructure

Business infrastructure involves the internal facilities and resources that the business operation is built on.

This may include computer systems, design centres, administration, manufacturing operations, and so on.

Business infrastructure provides the facilities that are necessary to develop new products and markets, and to support the on-going operations of the business

Although business infrastructure could be considered to be a business model in some respects, the issue of infrastructure applies to all business operations.

This includes small enterprises as well as large business organisations.

In the case of small enterprises or sole traders, a single individual may perform several roles.

Also, different activities may occur at different times, and some elements of the infrastructure may not operate on a continual basis.

For example, the resources of the enterprise may be focused on product development for a periods of time, and then on manufacturing, rather than both operations occurring in parallel.

However, regardless of the situation, building and operating the infrastructure of the business remains a separate task from performing the business operations themselves.

4.5.1.1. Infrastructure vs. operation

The business activity can be broken into two sections.

This involves the infrastructure of the business, and the actual operation of the business.

The infrastructure provides the facilities that are needed to conduct a business operation.

The operation itself then uses these facilities to conduct the business activity, such as supplying products to customers.

4.5.1.2. Costs of infrastructure

Infrastructure activities may require considerable funding, both on a capital expense basis, and on an on-going cash flow basis.

For example, a product design centre or a software development centre may involve a significant on-going expense.

However, business infrastructure also provides the necessary facilities to expand the business into new markets, support efficient and high volume processing operations, and develop the future of the business.

4.5.1.3. Continuous & project-based activities

Infrastructure sections perform either project-based operations, or continuos operations.

Manufacturing operations, administration services and computer systems support are all continuous operations that may be performed as part of the business infrastructure.

Project-based operations may include product design and development, computer software development, and developing a new market for a product.

4.5.1.4. Funding

Infrastructure can be funded on a cash flow basis, or on a capital allocation basis.

Capital is used for large projects.

This may involve allocating a sum of capital to fund a project, with the returns from the project flowing from future income.

In the case of continuous services, a stable level of cash flow may be involved.

Some project-based areas may be funded on a cash flow basis.

This may involve producing small projects on a continual basis, or developing large projects at the rate that is supported by the cash flow.

4.5.1.5. Internal & external services

Either internal or external services can be used for infrastructure services.

External services may have the benefit of economies of scale and specialised knowledge, which may enable the service business to perform the services more effectively than an in-house area.

A major benefit with external services is the ability to increase or decrease the volume of processing as business conditions change.

This cannot be done easily with an in-house area, which has a largely fixed cost and capacity.

The capacity and cost may be too high during times of slow sales, and there may be insufficient capacity during times of high sales demand.

Use of services such as these also increases the flexibility of the business to adapt to changed circumstances, such as discontinuing products or commencing operations in new markets.

External services may also be used in the case of large projects were the business did not have the facilities to complete the project directly.

The use of internal services is relevant in cases where a detailed knowledge of the business itself is necessary, such as in the preparation of accounts and financial statements.

Internal services are used in cases where an effective external service is not available.

Also, maintaining internal services allows the business to exercise control over the quality standards of an operation.

External service providers vary widely in the level of service and the standard of results that are offered.

4.5.1.6. Internal charging

In some business structures, internal service areas charge each other for services.

This is usually based on accounting entries within the accounts of the business, rather than actual transfers of cash between bank accounts.

For example, a product design centre may source capital to develop a new product, and then charge licence fees to the manufacturing operation in return for the use of the design.

The internal charging approach may have a number of potential benefits.

Each area could be considered a separate business, and managed according to the financial structure and resources of the area.

This method may allow problems within individual areas to be highlighted, ranging from insufficient capital to an overcapacity in comparison to the rest of the business.

Also, each area could then directly compare the service provided and the fees charged by other areas with external service providers.

Although the internal charging approach may have considerable benefits in concept, in practice many attempts to implement this approach have not been particularly successful.

This may occur due to the fact that a business area is often not given the practical alternative of changing service providers to another service.

When disagreements and disputes arise, this may simply result in both parties retreating to their existing operations, with no changes being made, and with the original problems continuing as before.

This problem may be less severe with external service providers, as an alternative service can be selected when the service provided does not match the agreed level.

4.5.1.7. Using infrastructure

Once the infrastructure is in place and operational, the infrastructure facilities can be used to operate the business.

This may involve the product design centre creating products, the manufacturing operation producing items for sale, and the administration centre processing accounts.

The business operation itself involves using the infrastructure facilities to deliver products to customers and develop new markets.

4.5.1.8. Infrastructure vs. operation

If a large proportion of the business's resources are devoted to infrastructure, then the business may have efficient high-capacity resources, with high fixed costs, that are not fully utilised due to the lack of resources devoted to operating the business and developing markets.

At the other extreme, a lack of investment in infrastructure issues may lead to a business with large volumes of manual processing, limited product designs, a high cost-per-unit and slim margins.

An appropriate proportion of the business's resources should generally be devoted to infrastructure, compared to general business operations, in order to ensure that the business operates effectively.

4.5.1.9. Problems with infrastructure

4.5.1.9.1. Activities that never complete

In some cases, a project or research area can degenerate into an on-going development that never completes.

When these situations arise, this can become a permanent and significant drain on cash flow.

The risk of this situation arising may be reduced by taking some of the following steps:

- Organising several small projects rather than one very large project.
- Ensuring that clear goals and time frames are developed for each project.
- Ensuring that general research areas produces regular results that have an equivalent benefit to the business compared with the costs involved.
- Reviewing all expense areas regularly to ensure that they are performing a function that is necessary for the business operation, or that there is a clear end to the negative cash flow in sight, with a clear result expected when the project is completed.

This problem can occur particularly with software development projects, when in some cases an overly-ambitious project enters a state of continuous development, when it is likely that a completed and working system will never actually be created.

This problem also occurs in research areas, which research may gradually change direction into areas that do not produce an operational result that could be implemented by the business within a practical period of time.

4.5.1.9.2. Unsustainable operations

In some cases, the cash drain from a large development project or a large research area may lead to negative cash flow for the business overall.

This is an unsustainable situation, with the net assets of the business falling to zero as the capital is consumed by the cash outflow.

In the case of large projects, steps should generally be taken to ensure that a project is completed and that the expenses end within a practical period of time.

If a clear end to the project within reasonable time period cannot be determined, then the project may be discontinued to restore cash flow to a positive value.

In the case of permanent development areas, such as research and development operations, the area could be reduced in size to reduce the expense level.

4.5.1.9.3. Overcapacity

Overcapacity occurs when an infrastructure area is created that is too large to be supported by the ongoing operations of the business, or is not in proportion to the capacity of the other infrastructure areas within the business.

In order to operate effectively, the capacity of each element of the infrastructure must be in proportion to the other elements.

Also, the total capacity of the infrastructure system should not be too large or too small to support the business operations, and the capacity should not exceed the underlying demand within the market for the business's products.

4.5.1.10. Types of infrastructure

4.5.1.10.1. Operations & service centres

4.5.1.10.1.1. Manufacturing operations

Manufacturing operations produce physical items from the raw materials.

Manufacturing may involve production facilities and equipment, inventory and production management, and so on.

Manufacturing operations may also perform contract manufacturing for external businesses, as well as manufacturing for internal operations.

Under an internal charging system, a manufacturing operation may pay licence fees to a design centre for the use of product designs.

This is the same process than would be followed if the manufacturing operation licensed designs from external businesses.

4.5.1.10.1.2. Computer software development

Computer systems are a major component of business infrastructure.

Although the cost of computer hardware and support may be significant, the major cost for many businesses involves the cost of purchasing or developing software.

Software systems may support operational process in large volumes with efficient processing, provide business information that can be used in managing the business and developing new markets, and be used in product design and development.

Many medium sized and large businesses maintain internal software development areas.

Although general software such as accounting and personal computer software can be purchased commercially, software than deals with the business's products and processes must generally be written specifically for the business.

Individual projects may involve internal permanent staff, individual contract developers, or an external business which may produce the system on a contract basis.

Software purchase and development is a major expense for many businesses.

Although this is often viewed as a cash flow expense, individual projects are effectively a capital expense.

A more accurate financial analysis of software may involve recording developed systems as assets, and deprecating the asset over the expected life of the system.

As with physical equipment, computer systems are often patched together for long after their useful working life has ended.

In these situations, the problems that may arise with software systems are similar to the problems that may occur with equipment.

Processing may be slow, error rates may be high, a large amount of manual input and adjustment may be needed, and so on.

In these cases, a software system should generally be depreciated over its useful life, and then scrapped and re-written, or an updated software package could be purchased.

4.5.1.10.1.3. Product design

A product design centre may design and develop new products.

This may include some of the following areas:

- The physical design, including engineering development, testing prototypes, computer simulation and so on.
- Designing packed services products.
- Developing the cost structures and planned volumes for new products.
- Designing the manufacturing processes necessary to produce the product.

- Researching market interest in the product, and adapting the design to meed market interest.

A product design centre could also design products that are not used by the business, and licence these products to external businesses.

Licence fees could be charged to other areas, to allow the design centre to operate on an independent commercial basis.

4.5.1.10.1.4. Administration

Administration involves processing receipts, making payments, maintaining records, and distributing information, such as statements, to customers.

Administration makes heavy use of computer processing, and in general an administration software system must be written before a new product can be effectively administered.

High volume administration involves the use of high-speed printers, mail sorting machines, data entry operators, and rapid computer processing to process large volumes of transactions is short periods of time, at a low cost-per-unit.

This type of facility can be used in contract service providers that operate facilities for many clients, and in cases where the business deals with a large number of customers, such as large retail banking operations.

Using an internal charging system that involves payments such as fees for administration transactions may be useful in determining the profitability of individual products.

4.5.1.10.1.5. Market development

A market development infrastructure area may involve developing new markets for the business's products.

This would differ from the operational sales and marketing area, which would market the existing products to customers, conduct presentations, and develop concepts for new products.

A market development area could develop markets within new regions, investigate new groups of products, arrange new distribution channels for the business's products and so on.

4.5.1.10.1.6. Treasury

A treasury operation may organise the capital raisings of the business, such as the issue of bonds to investors, and manage the structure of the business's debt.

Treasuries also manage cash flow, and may hold portfolios of hedging instruments to manage the business's risk exposure to commodity prices, interest rates, and foreign exchange rates.

Some treasury or trading areas also operate speculative activities as a profit-making activity.

However, trading operations within general business activities are often not profitable in the long term.

This may occur for several reasons.

In the case of assets such as shares, property and bonds, income may be received from the asset. In the case of shares and property the asset may also increase in value over time.

However, in the case of two-sided instruments such as futures and options, the transfer is a zero-sum event.

At the expiry of the contract, a transfer occurs in one direction or the other, depending on the price movements during the period, with the profit and loss of the two parties cancelling to zero.

In a case of speculation involving two-sided instruments, some trades may generate a profit while others generate a loss, and developing an operation that is profitable over the long term may be difficult on this basis.

Also, an effect known as the "efficient markets" effect may affect the returns from trading activities, as opposed to long term investment in assets.

The efficient markets effect suggests that all current information is already included in setting current prices.

In this situation, purchasing an asset at any point in time may only result in a long term return, with consistent short-term returns being difficult or impossible, as known information may already be included in setting the price, and unexpected events may be either positive or negative for the price of the asset.

4.5.1.10.2. Static infrastructure

In addition to the resource areas within the business, a number of static infrastructure components may also be used.

This could include some of the following items.

4.5.1.10.2.1. Computer facilities

The computer facilities of the business include the computer hardware, software, and support services.

This allows a fully operational information technology system to be maintained.

A range of different alternatives are available for each part of the structure, including the hardware, software and support.

Equipment can be purchased, leased, or provided by an external business under a contract arrangement.

In some cases a single external vendor is used to supply hardware, software, and on-going support.

In other cases a combination of internal resources and external sources are used to develop and maintain the information technology infrastructure.

Software can be purchased, leased in some cases, developed in-house, or developed externally under a software development contract.

Support can be provided by an in-house area, or by an external service provider.

4.6. Administration

Administration involves making payments, processing payments from customers, and keeping records of various kinds.

Records include details of customers and current agreements with customers, accounting information, and other information such as supply orders.

Administration is a labour-intensive activity and may involve large volumes of documents for invoices, statements, customer agreements and so on.

4.6.1. Computer systems

Computer processing is heavily used in administration.

An administration system typically contains a large database recording all relevant information, together with processing functions for printing statements, generating transactions and so forth.

Accounting records are often kept in a separate accounting system from the product and customer details, as a range of accounting systems are commercially available.

Administration systems are typically written specifically for the business and the products that are administered.

These systems and may be developed in-house, or externally as a contract development project.

In some cases, commercial software systems are available for specific types of activity, such as administering insurance products or manufacturing inventory management.

Administration areas vary widely in the level of manual paper processing that is performed, compared to the use of computerised processing.

For example, small enterprises and the administration of new products within larger businesses may involve a large amount of manual processing using paper files, with basic computer entries for items such as records of payments received.

Manual processing may be expensive, and this approach also limits the volumes that can be processed and the turn-around times that can be achieved by the operation.

A significant capital cost may be involved in purchasing or developing a computerised administration system.

However, in general the total costs under this approach are lower than using a manual administration method.

This is a similar situation to manufacturing, where investment in high capacity, efficient production facilities generally leads to increased capacity, reduced error rates and a lower cost-per-unit.

4.6.2. Development of administration systems

There are two potential problems with the use of computerised processing.

This involves the cost of the system, and the time delay involved in the development.

Large administration systems, as used in banking, insurance, manufacturing and so on, can cost many millions of dollars to develop.

However, this cost is generally less than the alternative of performing all administration manually.

A second potential problem relates to time delays.

The development of administration systems generally requires a minimum of several months, and in the case of large systems, several years may pass before the system is fully operational.

This may present a problem for the launch of new products, which cannot be effectively administered until a software system is available.

In practice, this generally leads to a period of time where administration is performed using a combination of manual processes, alterations to existing systems, and basic temporary systems.

This process can lead to large costs, high error rates, and slow processing times.

This problem may be particularly significant when this situation becomes a permanent condition of the operation.

The risk of these problems arising may be reduced by using several small systems rather than one large system, and by ensuring that systems are designed for flexible operations.

The use of external contract development may also reduce some problems with time delays.

The resources of an internal development area are generally set at the level required to support the on-going operations of the business.

However, when a large project is required, this may result in a long period of time being required to complete the development.

In these cases, a solution based on a large number of resources, for a short period of time, would be preferable to a solution involving a small number of resources for a long period of time.

The total cost in each case may be similar, as the same volume of work is performed in either case, however the time delays involved in the second approach could have a significant impact on the business operations.

4.6.3. High volume administration

High volume administration occurs in situations where the business involves a large number of transactions.

Utility businesses that supply gas and electricity to the general public are examples of this.

These businesses receive a large volume of individual payments and issue a large volume of statements and invoices.

High volumes can be processed by ensuring that computer systems are available that can perform the full range of transactions that are required.

Data entry can be performed by data entry operators, while some operations also include automated scanning that can input some types of information by scanning paper forms directly.

Businesses that perform high volume administration can support low costs per transaction by spreading the fixed costs, such as the development of computer systems, across a large number of transactions.

These operations may include facilities such as high speed printers and mail-sorting machines, that may increase the speed of processing, increase the volume of processing that can be performed, and reduce the cost per transaction.

4.6.4. Electronic links

Electronic transfers of payments and updating of information may reduce administration costs.

In the case of retail customers, the payment method is generally chosen by the customer, not the business.

However, an increasing proportion of payments are being made electronically.

This approach may also reduce time delays and reduce error rates.

Electronic links are often used to transfer large volumes of data between businesses.

This can occur through a live connection, or through a bulk transfer, using data files stored on media such as a data tape, or transferred through an on-line connection.

For example, a business processing direct debits from customer bank accounts would submit a data tape to the bank when transactions were due, with the transactions being directly processed by the banking system.

4.6.5. Contract administration

Contract administration involves using an external administration service to perform administration.

This may result in cost savings due to the economies of scale that are possible with larger volumes.

Fees may be based on fixed monthly fees, a fee per transaction, or some other method.

A contract administration service is generally governed by a Service Level Agreement.

This specifies the types of transactions that will be processed, the fee arrangements, and the turn-around times for each type of transaction.

In the case of external service providers, this agreement would form the contract between the business and the supplier.

When internal service areas are used, the service level agreement may specify the standard processing times and volumes, and may include internal charging arrangements.

In some cases, particularly when internal areas are used, a detailed document may be prepared and agreed, but over time this may be forgotten and a wide range of response times and other results may occur.

In cases where a service level agreement is in place, this should generally be reviewed periodically and monitored to ensure that it remains effective.

This problem may be partially addressed by including regular reporting within the agreement itself.

For example, this could include a monthly report containing the number of transactions processed, the number of new customers, and the percentage of transactions that were completed within the nominated response times.

Service level agreements are also sometimes posted for tender, with service providers submitting tenders of fees and other details in response to the specified requirements.

These arrangements are also used in other circumstances such as maintenance agreements with external suppliers.

4.6.6. Complexity & Customisation

The complexity of products, and the amount of customisation performed for individual customers, may have a significant impact on processing costs.

This issue applies to computer systems and also to manual processing.

This issue should not alter the development of effective products, or limit negotiations with potential customers.

However, this problem may affect the general product strategy and operations of the business.

For example, if one product option was selected by 1,000 customers, and a second product option was selected by 1 customer, then this second change would double the amount of programming work involved in developing an administration system.

The time and cost involved in the development of an administration system is dependant on the complexity of the product, and is not directly affected by volumes.

Similar issues may arise in the development of manufacturing facilities.

The complexity of product features is one issue affecting the costs of administration.

A product that contains a large number of features may require additional programming time in the development of an administration system, and may involve slower manual processing.

This problem may be addressed by designing products with a simple range of effective options, rather than a large number of complex and over-lapping features.

Also, transferring existing arrangements from old products to updated products, and then discontinuing the old product line, is generally preferable to continuing to operate two product lines in parallel.

This issue also applies to other areas of the business, ranging from the production of marketing material to preparing accounts.

A more serious problem arises with non-standard arrangements with customers.

For example, a specific arrangement may be made for a large customer who transfers from a competitor's product.

This may include a customised arrangement with the customer, which could involve calculating fees on a non-standard basis, such as a transaction-based fee rather than an asset-based fee.

In these cases, the business should generally attempt to use standard features where possible.

If a non-standard arrangement is necessary to the particular situation, then this feature can also be added to the product line as a new standard feature.

The potential for these types of problems to develop may be reduced if some of the following situations are avoided.

- Maintaining several products that perform a similar function, but are different in a large number of specific features.

  An example of this may involve continuing to sell an old product line, when a new product line had been developed to replace the previous product.

  This situation can also arise when businesses are merged with other organisations.

- Arranging specific features and alterations for individual customers, that are outside the standard features and options that are included within the product.

  A significant amount of programming and manual processing may be required to implement a minor alteration that is made for a particular customer.

- Designing products that have complex features when the same result could be achieved using a simpler set of product options.

  In general, separate options for each part of a product leads to more flexible products and simpler administration, compared to selecting from a long list of overlapping product alternatives.

4.7. Information Technology

Information technology is a major expense in many businesses.

This includes the cost of computer hardware, computer software, and supporting computer systems.

Information technology is a capital intensive industry.

This is not always recognised, as no physical items are created during the software development process.

However, commercial software packages may have costs in the million dollar range, while large software development projects may involve thousands of people and a capital cost of 100 million dollars or more.

4.7.1. Elements of information technology

The three major elements of an information technology infrastructure are the hardware, the systems support operations, and the software.

Computer hardware may be a significant business expense.

Advancements in computer technology occur at a rapid pace, and computers may need to be replaced every three or four years.

This results in the depreciation expense of computer equipment being high, in contrast to other equipment such as manufacturing equipment which may have a much longer life span.

Expenses are also involved in installing and configuring computers, fixing hardware and software problems, and training and support of system users.

In many cases, the on-going support costs are a larger expense than the hardware purchase itself.

In general, however, the largest component of the information technology costs relates to software systems.

These may be software packages that are purchased commercially, software systems that are developed by in-house teams, or software developed by external parties under a development contract.

Computer systems are also used within business operations for industrial process and machine control, design work such as engineering simulations and graphic design, and for embedded machinery control within products.

4.7.2. Uses of computer systems

Computer systems are used for a wide range of purposes within a business operation.

The term "Information technology" generally refers to computer processing of business-related information, while computer systems in general are also used for a wide range of other purposes within business operations.

Major uses of computer systems within business may include the following areas:

Administration systems	Processing receipts, making payments, issuing statements, and maintaining records. This generally involves a large database of information, together with processing functions.
Business information systems	Systems for reporting production statistics, budget and financial details, sales and margin trends, and so on
Design systems	Graphic design, engineering modelling, etc.
Personal computer systems	Software for producing documents, producing marketing presentations, analysis of figures for such project profitability, new product costs, etc.
Manufacturing systems	Production management, inventory control, process and machinery control, costs analysis, and so on.
Marketing systems	Measuring product profitability, determining customer profiles, and contacting customers.
Within products	Embedded control of machinery, sales of software developments.
Data	Product specifications, customer & contract details, technical information such as materials information used in engineering design.

Some businesses use computer systems in relation to the products and services themselves, in addition to the administration and operational functions that may be used.

For example, telecommunications businesses use computer systems heavily, while architectural and engineering design also makes extensive use of computer technology.

Data can be valuable, and a database of information may form the basis for the entire business itself.

For example, a map production company may use a database of geographical information to generate maps of various descriptions.

Assembling this information may involve considerable time and expense, and this information may be the key factor in enabling the business to offer products and services that competitors could not easily duplicate.

In situations such as this, the data stored within the database may be the major asset of the business.

Databases can be compiled internally by the business, or in some cases can be purchased from external sources.

4.7.3. Software development

Software development is a project-based activity.

Development projects follow the same basic steps as other design and construction projects, such as the development of a commercial building.

An initial design phase would result in a project plan involving a list of tasks and a schedule of timeframes.

Following this, a detailed design phase may be involved, followed by the programming tasks, and finally testing, documentation, and other tasks such as data conversions.

Software development can be considered a capital project, and may be funded from a capital allocation or from on-going cash flow.

In the case of general software development, such as reporting and administration systems, the system may affect the overall operation of the business, rather than generating a specific cash flow, such as a new product development may produce.

In these circumstances, valuing a software development using a method such as a net-present-value approach may be difficult.

General development projects may need to be reviewed on the basis of their overall impact on the operations of the business.

4.7.4. Development approaches

Some businesses operate an internal software development area.

This area would generally be funded on an ongoing cash flow basis.

Alternatives include the use of external contract suppliers to develop specific systems.

In practice, many systems are not optional and must be completed for the business to continue operating.

For example, a new product cannot be fully launched until an administration system has been written to administer it.

Commercial software packages are available for some common business functions, such as accounts, administration of some types of products, and inventory management systems.

However, in most cases a system that involves the products, services and operations of the business, must be developed as an individual project.

4.7.5. Costs

Software development may be a significant cost to the business.

The same issues apply to software development as other internal areas, such as product development and design centres.

If projects are operated on the basis of long-term directions, rather than specific timeframes, then the operation may become a permanent drain on the cash flow of the business and may not produce items that are of practical use to the business.

An area that is too large to be supported by the business operations may reduce the profitability of the business.

Conversely, insufficient investment in new systems may lead to high processing costs, restricted volumes, quality problems, and difficulty in effectively managing and developing the business.

4.7.6. Fixed costs

Software development is a fixed cost.

Business volumes may have a significant impact of the average cost of the development, when spread across the total number of customers or transactions.

When a development has been completed, a software system may have few on-going variable costs, regardless of volumes, apart from the general costs involve in operations such as staff costs.

Due to this effect, a large software development may lead to a leveraged effect within the business.

Low volumes may result in a large loss, due to the cost of the project, while high volumes could result in a large drop in the average processing cost of individual transactions.

In cases where economies of scale are available through capital projects, an industry may become concentrated among a few operations, each with large volumes, efficient production or processing, and low costs per unit.

Although economies of scale are often considered in relation to manufacturing, a similar situation may occur in some service industries, involving the development of computer systems for automated processing.

In a similar way to a high capacity manufacturing facility, a complex software system may involve a large capital cost, and may allow efficient processing of transactions with less manual input and lower costs per

transaction that a process that is performed using a labour-intensive manual approach.

4.7.7. Maintenance

As with physical equipment, software systems also require maintenance.

Scheduled regular maintenance is not generally involved, as would be the case with physical equipment.

However, software maintenance may involve fixing bugs, making minor alterations, and adding processing functions for new product features.

This generally involves making small changes in order to allow the system to continue operating effectively.

Examples of maintenance changes may include modifications to a system to update processing due to a change in government regulations.

Larger changes to systems may involve adding significant new functions, such as when a new product line is launched.

Maintenance of software systems is not generally a major expense, with the major expenses being related to new developments.

4.7.8. Lead times

Software development may involve a considerable period of time.

A development of any significance would usually require a minimum of several months, and in some cases several years may be involved before a system is fully operational.

This can present a significant problem for a business.

For example, a new product may be designed and marketing information may be prepared, however an administration system to administer the product may not be available for twelve months.

In another example, the business may commence operations in a new market, without the systems infrastructure being available to report operational results or manage production.

Examples of these problems may include commencing overseas sales, where transactions are conducted using foreign currencies for the first time.

These situations are generally handled with a combination of changes to existing systems, manual processing of paper files, and temporary systems created to perform essential functions.

This can lead to high costs, slow response times, and high error rates.

This may be a particular problem when this becomes a permanent situation, with new products being developed in a cycle that is ahead of the systems development.

Delaying products would not be an effective solution to this problem, as opportunities may be lost and the business may fall behind competitors.

The problems that can arise in these situations may be reduced though some of the following steps.

- Using several small systems with system links, rather than a single large system.
- Carefully managing temporary arrangements to ensure the some of the potential problems do not occur.
- Ensuring that systems are designed for flexible operation and contain structures and facilities that would enable future changes to be made without excessive difficulty.
- Where possible, allocating a large number of resources to a project for a short period of time to enable the project to be completed within a short time frame. This may involve concentrating resources on a single project for a period of time, rather than multiple projects, using contract staff, or arranging a system development by an external contract development business.

4.7.9. Distributed & Centralised computing

The structure of large computer facilities falls into two broad categories.

Centralised computer systems use a central mainframe system, connected to a number of terminals at different locations.

These systems may have advantages with security, and lower per-terminal support costs when a large number of access points are involved.

This approach is commonly used in situations where the same processing is performed at a large number of separate locations, such as banking.

Mainframe systems are also used when very large volumes of data storage are involved.

Distributed systems use personal desktop computers, or computers supporting a limited area of operations.

These computers are generally connected together by a network of some kind.

This approach generally supports more complex processing at the individual computer, and is useful when a range of different functions are performed in different areas.

Also, hardware costs for distributed systems may be lower than for centralised systems in the case of small and medium sized operations.

Although each situation may vary, an operation with less than 100 separate terminals or computers may be more cost-effective using a network arrangement of personal computers that using a central system.

In cases where several hundred terminals are involved, performing similar operations, a central mainframe system may be more suitable.

4.8. Manufacturing

Manufacturing involves producing physical items from raw materials.

This includes a wide range of different activities, ranging from baking bread to constructing aircraft.

Manufacturing is a significant section of the economy.

Many businesses operate purely as manufacturing operations.

In other cases, a business may have a manufacturing operation within its structure, and also perform a range of other activities as well.

Many of the issues involved in manufacturing also apply to other business activities, such as the primary production activities of mining and agriculture.

4.8.1. Elements of Manufacturing

4.8.1.1. Capital costs

Manufacturing is a capital-intensive business.

Manufacturing facilities and equipment may have a high capital cost.

The capital requirements of the business can be funded with debt or with equity funds.

Alternatively, many items of equipment can be leased.

Leasing may be arranged through banks, leasing companies, and in some cases the equipment manufacturer themselves.

This approach may reduce the direct capital requirements of the business, and may be particularly suitable for start-up and expanding operations.

Leasing is a secured form of lending, and arranging an equipment lease may be easier than raising ordinary debt in some cases.

Manufacturing is an asset-based activity, rather than a cash flow or project-based business.

Equipment and facilities deteriorate over time, and have a limited useful working life.

Regular reinvestment in new equipment and facilities is necessary to allow a manufacturing operation to continue producing items efficiently.

4.8.1.2. Depreciation

Depreciation is a major expense in many manufacturing operations.

Depreciation represents the reduction in the value of the equipment and facilities over a period of time.

Depreciation does not represent a cash transaction, however it does represent a loss of net assets.

A manufacturing operation may generate a positive cash flow, and yet still record a loss.

For example, the business may generate a net cash flow income of $15 per year, and have a depreciation expense of $20.

In this case, cash would be flowing into the business at the rate of $15 per year, but the value of the equipment would be declining at the rate of $20 per year.

This would result in a net loss of $5 per year.

This issue highlights the importance of production volume and capacity utilisation to a manufacturing operation.

The depreciation expense is a constant expense with each new period, however the income of the operation is dependant on the level of production and sales.

In the case of ordinary business activity, if no activity occurred and no payments were made during a time period, then no loss or profit would be recorded.

However, in the case of a manufacturing operation, a situation involving no activity, no income, and no expenses, would result in a continuous loss being recorded.

This would occur due to the fact that the value of the equipment and facilities continually declines as time passes.

In these situations, a minimum level of production may be necessary to reach a break-even or positive profit level.

In the case of some other capital-intensive businesses, that may involve large investments in assets such as property, financial assets or mines, this issue does not arise, as the assets do not depreciate in value.

In the case of manufacturing operations, both the cash flow accounts and the accounting-based analysis may have important significance for the business.

4.8.1.3. Volumes

General business analysis deals with financial figures.

This may include income and expenses, asset and debts, margins, and so on.

In the analysis and management of manufacturing, the number of items produced is also important, in addition to financial figures.

Production management deals with the volume of products that is created and the volume of raw materials that is used during a period of time.

In turn, these volumes affect the cost structure and profitability of the business.

Similar issues could also apply in some other business situations.

For example, the number of items sold in a retail operation, and the number of hours billed by a service business, are both volume-based figures that may affect the financial structure and results of the business.

4.8.1.4. Fixed & variable costs

Manufacturing costs may be broken into two categories.

Fixed costs

Fixed costs do not vary with the level of production.

These include building rents, depreciation, and general costs such as marketing and administration expenses.

Fixed costs apply to a period of time, and are not affected by the volume of production.

Variable costs

Variable costs are costs that apply to the production of specific items.

This may include raw materials, and other costs such as fuel and electricity.

Variable costs apply to the volume of production, and are not affected by time periods.

Total costs

The total costs of a business during a period are a combination of the fixed costs and the variable costs.

The fixed costs are spread across the volume of production that occurred during a time period.

High production volumes result in the fixed costs being spread across a large number of items, which leads to low total cost per unit.

Proportion of fixed & variable costs

The proportion of fixed to variable costs may be influenced by a range of factors, such as the level of mechanical automation involved in a production process.

A process involving high capacity facilities and equipment may generally have a high fixed cost and low variable costs.

In these cases, the business may experience a large leverage to rising or falling sales.

In contrast, a process than involved a large proportion of manual input may have low fixed costs but high variable costs.

In these cases, the leverage to rising or falling sales may be lower.

4.8.1.5. Profit & volumes

High volumes may increase the profit of a manufacturing operation in two ways.

The number of transactions is larger in the case of high volumes than low volumes.

Also, the profit margin for each individual transaction is higher in the case of high volumes, due to the fixed costs being spread across a large number of units.

Low volumes produce low profits or losses due to the opposite case of the same two effects.

4.8.1.6. Economies of scale

In general, the cost per unit of production decreases as the capacity of the process is increased.

For example, a printing machine that prints 10,000 pages per hour would generally involve a lower cost per page than a machine that printed 100 pages per hour.

Building high capacity facilities and purchasing high capacity equipment may have a significant capital cost.

However, this may also allow the cost per unit to be reduced.

Many manufactured items are sold in open markets against competitors with similar products and production facilities.

In these situations, the manufacturer with the lower cost per unit can offer lower sale prices and may receive a large volume of sales.

This cash flow may be reinvested in higher capacity facilities, which may lead to a repeating cycle of expanding sales and capacity, and falling costs per unit.

This effect results in many industries becoming concentrated among a few manufacturers producing large volumes at low costs per unit.

One approach may involve an assumption that the cost per units falls at a constant rate each time that capacity is doubled.

For example, one rule-of-thumb that may be used within manufacturing, may involve costs per unit falling by 40% each time that capacity was doubled (** check).

Under this assumption, the fall in cost-per-unit when capacity was increased from 50 units to 100 units would be the same percentage fall that would occur when capacity was increased from 5,000 units to 10,000 units.

The affect can be illustrated in the following graph, which shows the decline in cost-per-unit that may occur with large-capacity facilities compared to small-capacity facilities.

This issues relates to both the volume of production from a particular facility, and the size of the production facility itself.

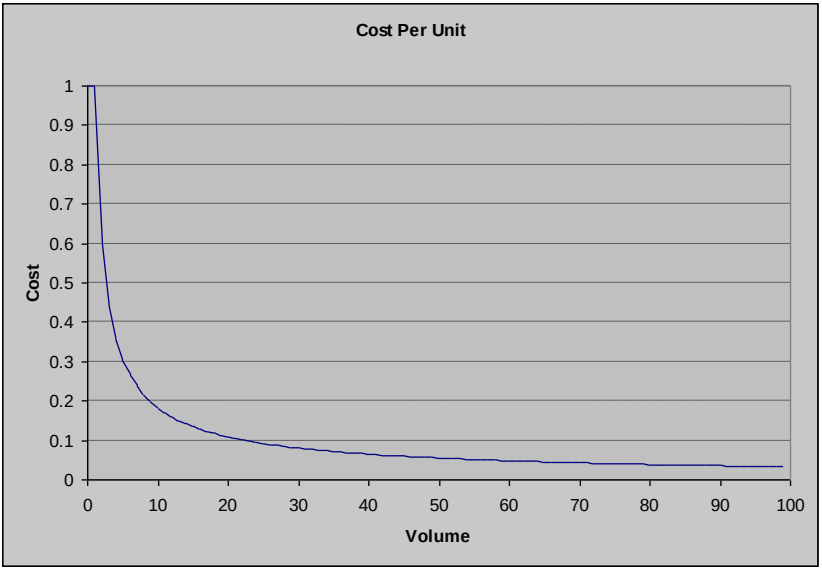


Figure 2

4.8.1.7. Capacity

Capacity refers to the number of items that can be produced within a particular period of time.

Under-capacity occurs when the production facilities can only produce a limited volume of output within a period of time.

Over-capacity occurs when a large and expensive facility has been built, with high production capacity, that is not fully utilised.

4.8.1.7.1. Under-capacity

Under-capacity may be a problem in several circumstances.

If other areas of the business have a higher capacity than a particular facility, then the other areas of the business may not be able to operate at full capacity, due to the limitations of that facility.

This may result in other areas operating at partial capacity, which may increase costs-per-unit as the fixed costs would be spread across a small number of items.

An example of this may be a power supply facility.

In some operations, such as mining activities in remote areas, the processing plant includes a separate power generation facility to generate electrical power for the main facility.

This could be powered by coal, oil, or natural gas for example.

If the production facilities were extended, the power generation plant may not have sufficient capacity to power the expanded facilities.

In this case, the under-capacity of the power generation would prevent the facility from operating at full capacity.

Another example may involve a successful product with a wide distribution channel, where the business did not have sufficient production capacity to meet the demand for the product.

Under-capacity may also cause problems with competing in open markets.

A business with limited production capacity would generally experience higher per-unit costs than other manufacturers.

In these circumstances, it may be difficult for the business to compete effectively in a particular market.

Problems with under-capacity could be addressed in several ways.

These may include the following approaches.

- Constructing new facilities or purchasing higher-volume equipment.
- Improving production management and removing bottlenecks in existing facilities, to enable a higher volume of production to be achieved from existing facilities.
- Hiring temporary facilities.
- Arranging production by other businesses on a contract basis.
- Purchasing materials or parts from other businesses where the business does not have sufficient capacity to produce the items internally.

4.8.1.7.2. Overcapacity

Overcapacity occurs when a facility has been built that has a higher capacity than the underlying demand for the product.

This is a separate issue to an existing facility being underutilised, although the net result may be similar.

Overcapacity can occur when optimistic assumptions were made regarding the demand for a product, and where the design capacity of the facility is higher than the market demand for the product.

Overcapacity can also occur when a facility is built with additional capacity to allow for future expansion, however this expansion does not occur in the medium term.

For example, constructing a major facility or purchasing a large item of equipment is generally a major transaction.

Equipment may be renewed every 10 or 15 years, while large production facilities may operate for half a century or more.

During times of high growth, it is common to build a facility with larger capacity than current needs, to allow for future growth, and to reduce the risk that problems with under-capacity may arise in the future.

However, if this is done at the peak of a period of sales growth, then a facility with a large capacity may be built and may never be fully used.

When a facility has excess capacity, the depreciation expense and the capital cost may not be offset by the level of production, and poor profitability or loss-making operations may occur.

Overcapacity may be addressed in some of the following ways.

- Performing contract manufacturing for other businesses.
- Expanding other facilities to match the capacity of the facility with the excess capacity.
- Increasing marketing efforts to increase sales, such as expanding into overseas markets.
- Creating new lines of products to operate in new markets, and to use a larger proportion of the available capacity.
- Closing operations within parts of a facility to reduce on-going expenses.

4.8.1.7.3. Closing facilities

Facilities may be closed either temporarily or permanently when there is insufficient demand for products, or when market prices are low, resulting in the facility being unable to operate at a positive profit level.

Closing facilities sometimes occurs in mining activities during periods of low market prices.

This involves ceasing operations, returning contract and hired equipment, and placing the mine on a “care and maintenance” basis.

The process of closing or reopening a mine may involve considerable expense, and this is usually done during a period of sustained low prices.

The maintenance operations may involve a small on-going expense to ensure that equipment is properly stored, and that the facilities remain in a stable condition.

A similar process can be applied to parts of industrial plants.

This procedure may be less common with industrial plants than with mines, as the value of the mine ore does not decline over time, however the value of industrial equipment and facilities falls continuously.

The accounting depreciation expense is generally spread across the estimated working life of the equipment.

However, this assumes that the equipment will be used at a standard rate of production.

In reality, the value of the equipment may decline at a lower rate when production is not occurring.

This is due to the fact that the majority of the decline in value may occur due to wear-and-tear, rather than purely due to the passage of time.

Closing facilities may involve reducing the expenses relating to lighting and heating, recovering capital held in raw materials stocks, reducing salary costs involving permanent employees, and so on.

4.8.1.8. Technology

Technology is a significant issue in manufacturing.

In most markets, competing manufactures offer products that may be similar to the business's products.

Although effective management of the business and the facilities may have a significant impact on costs, the major differences in costs may arise from economies of scale, and from technology.

A manufacturer than does not regularly re-invest in new technology and facilities may find that it gradually looses market share to competitors.

Technology involves the type of equipment that is used, computer hardware and software systems, the construction of facilities, and unique manufacturing processes.

These issues apply to individual machines, and also to the construction of entire manufacturing plants.

Unique technology

Unique technology may involve a process for producing items using less raw materials than previous processes, or it may allow larger volumes of higher quality items to be produced using existing resources than previous processes.

Examples may include a new type of plastic, which may enable plastic parts to be produced using less materials and with higher operating performance than previous processes.

Technology can be developed in-house by the business, or licensed from other parties.

An example of this situation may occur when a process is used within an overseas market, and is licensed by a manufacturer for use within a local region.

Updated equipment

The technology involved in machinery advances as time moves by.

A new machine may use less raw materials, have a lower fault rate, and may have a higher production capacity than a previous version of a similar machine.

This issue is additional to the effect of replacing worn-out equipment with new equipment.

Updating equipment may lead to a significant improvement in efficiency, particularly when this is balanced through the full production path, rather than production being limited by one stage in the process.

Technology within products

Technology can also be included with the final products.

This may include new materials, smaller manufacturing tolerances, embedded computer chips and so on.

4.8.1.9. Computer hardware & software

Computer hardware and software form a major component of large-scale manufacturing.

This may involve process control, and production management.

Process control involves computerised and other hardware control of machinery and facilities.

This is done using computer processing to control temperatures and pressures, flow rates, production rates and so on.

Ensuring that the process control equipment is operating effectively may have a significant impact on production capacity and efficiency.

Also, in some manufacturing operations, process control equipment could be installed to increase processing capacity, reduce error rates and materials usage, and allow the production process to be more effectively managed.

Production management software may involve scheduling production runs, analysing margins and product mixes, managing inventory levels and so on.

Effective software for performing these functions may improve the production rate and profitability of a manufacturing plant, particularly when a large number of different products are involved.

4.8.1.10. Manufacturing vs. Design

In the case of small enterprises and long-term products, the cost of the initial product design may not be a significant cost of the total business operation.

However, in the case of short product life cycles, or when large capital costs are involved in the design process, the business could effectively be split into two separate operations.

This may involve a product design centre, and a separate manufacturing operation.

Product design is a project-based activity, while manufacturing is a continuous activity.

In terms of reviewing the financial structure of the business, a clearer picture may sometimes emerge if these two activities are separated.

This can be implemented by separating the costs of each area, and creating licence fees that are paid from the manufacturing operation to the design centre.

This may highlight whether the two areas are in proportion to each other, or whether too much or too little capital is invested in the design process.

4.8.2. Types of manufacturing

Manufacturing occurs in various forms.

This may include some of the following issues

4.8.2.1. Standard products vs. single order

Some manufacturing operations produce a standard set of products, which may be updated from time to time.

Other businesses may operate on a single-order basis.

In these cases, items are produced specifically for clients, and the design of an item may be different in each production run.

For example, operations such as printing and creating customised items may involve a different design with each production run.

4.8.2.2. Continuous vs. batch production

Manufacturing processes may operate continuously, or for separate periods of time.

For example, the mass production line that was created to build the Model T Ford was the first example of continuous production in modern times.

Continuous production is generally the most efficient way to produce items in high volume, at low cost per unit and with low error rates.

Also, continuous production is necessary in some activities such as electricity generation, oil refining, and so on.

Batch production is used when a large number of different products are made, when volumes are limited, and when custom items are produced.

This process may involve setting up equipment, arranging supplies, performing the actual production run and then dismantling various structures.

The production of nuts, bolts and other fasteners may be an example of this, when in some cases several thousand different products are carried by the manufacturer.

4.8.2.3. Manual & Mechanical Production

Production generally involves a combination of manual activity and machinery operations.

Some small enterprises use purely hand-made production methods.

Hand crafts are an example of this situation.

In the case of large scale production, a manufacturing plant may be highly automated, with the entire production process being performed by continuous mechanical process, and human input being limited to monitoring process parameters to ensure than problems do not arise.

Power generation stations may operate on this basis.

As a general rule, the proportion of mechanical operation, compared to the level of manual activity involved, is higher in large-scale facilities than with small-scale facilities.

High levels of mechanical production may lead to high capital and fixed costs, with low variable costs.

Manual production may involve low capital costs and a high proportion of variable costs.

In general, a high level of mechanical production leads to lower total costs, higher volume capacity, and lower fault rates than manual production.

Manual production is suitable for low volumes and customised items.

Complex assembly generally involves manual processes in smaller enterprises, and automated processes in large-scale manufacturing.

Mechanical production is suitable for high volumes and for situations where accuracy and tolerances are critical.

4.8.3. Products & production

4.8.3.1. Product designs

The design of the products that are made within a manufacturing operation may come from several sources.

This may include some of the following.

- Products developed internally within an integrated operation.
- Products developed within the business by a separate design centre.
- Product designs licensed from external parties.
- Products made according to specifications supplied by outside parties, under a contract manufacturing arrangement that involves producing items for other businesses.
- Product made on a custom, single-order basis. For example, printing operations generally operate in this way.

In the case of product designs and technology licensed from other parties, license fees would usually be paid.

This may involve a fixed payment per period, an amount for each item produced, or some other approach.

4.8.3.2. Production output

The output from a production process may be generated for a range of purposes.

This could include some of the following purposes

- Items produced for sale by the business itself to customers or distributors.
- Items produced for sale into open markets.
- Items produced on behalf of other businesses, under a contract manufacturing arrangement
- Single items produced for specific customers, or customised production runs according to a customer order.

4.8.4. Analysis of a manufacturing operation

Analysis of a manufacturing operation involves the general business issues of margins, returns, cash flow and capital structure.

However, manufacturing analysis may be particularly concerned with assets, the volumes of materials produced, and the separation between the fixed and variable costs of production.

Costs and inputs to a production process may include the following items.

- Materials
- Electricity
- Fuel
- Labour costs
- Deprecation of equipment

Funding is generally a separate issue from the operational structure of manufacturing, and the values of equity, debt and interest costs are not included within a production or margin analysis.

In the case of leased equipment, the lease payments could be split into an interest component, and a separate component that could be included as a depreciation figure.

4.8.4.1. Production analysis

Production analysis is concerned with the volumes of items produced, and the volumes of raw materials used.

Production analysis relates to activity that occurred over a period of time, rather than static figures such as asset values that apply at a particular date.

In context of production analysis, labour costs includes payments to employees involved in production, and does not include staff costs relating to other business activities such as marketing or administration.

Production analysis may involve two major areas.

These may include the following points.

- The level of production in comparison to plant capacity and fixed costs.
- The efficiency of production, in terms of the number of inputs required to generate a finished product.

Production reports in large manufacturing operations may include a large volume of information and statistics.

This could include production volumes of finished goods, work in progress, supplies used, margins, and figures for various time periods.

Monthly reports may include figures for recent months, trend changes, totals over longer periods, and comparisons with the same period in previous years.

Although a wide range of figures, statistics and margins could be calculated and reported, some of the following items may represent some of the major issues.

4.8.4.1.1. Production trends

Although production levels may have a large impact on costs, the level of production is generally set by issues such as customer demand, marketing activities, and updating of product lines.

Production management may involve reviewing trend changes in efficiency.

This may include the amount of materials used to produce items, the number of employees needed to support a particular production level, and so on.

Deteriorating values for these figures may indicate that equipment is becoming outdated, that scheduling and shift management could be improved, or that new production processes should be implemented.

4.8.4.1.2. Production levels

Capacity utilisation refers to the volume of production during a period, in comparison to the plant capacity.

The capacity utilisation rate can be calculated using the following formula.

$$\text{capacity urilisatio n} = \frac{\text{number of items produced}}{\text{design capacity of the plant}} \times 100$$

For example, if a plant had a capacity of 20,000 units per month, and production was 15,000 for the previous month, then the capacity utilisation could be calculated using the following figures.

$$\text{capacity utilisatio n} = \frac{15000}{20000} \times 100$$

$$= 75\ \%$$

4.8.4.1.3. Availability

Availability may also be an important production management issue, in addition to capacity utilisation.

While capacity utilisation is a major factor in determining cash flow and profitability, the volume of production in the short term may be determined by the level of customer orders.

Availability refers to the percentage of time that a facility was available for use, whether production actually occurred or not.

A low availability rate may be due to frequent production stoppages due to worn-out equipment generating high fault rates, shortages of raw materials, equipment break-downs and so on.

Availability is a production management issue, in contrast to capacity utilisation, which may be a wider issue.

Capacity utilisation may be dependant on creating products that meet with a demand from customers, performing effective marketing activities, and ensuring that the business operation is efficient and allows products to be priced competitively.

A low availability rate may lead to low capacity utilisation, and long delays in filling customer orders.

The availability rate may be calculated using the following formula.

$$\text{availabili ty rate} = \frac{\text{hours availabile for use}}{\text{tota hours of potential production}} \times 100$$

4.8.4.1.4. Materials usage

The volume of a material used to produce a product could be calculated using the following approach

$$\text{materials usage per item} = \frac{\text{volume of material used}}{\text{number of items produced}}$$

For example, if 7 kilograms of plastic were used to produce 1000 plastic bottles, then the materials usage could be calculated using the following approach.

$$\text{materials usage per item} = \frac{7}{1000}$$

$$= 0.007 \text{ kg}$$

If the trend in materials usage gradually rises over a long period, then this may suggest that the equipment is becoming less efficient, with increased wastage and fault rates, and that replacement equipment may be necessary.

A similar calculation could be applied to the amount of electricity or fuel used by production processes.

For example, in the case of electricity, this could be calculated using the following approach

$$\text{electricity usage per item} = \frac{\text{amount of electricty used}}{\text{number of items produced}}$$

In this case, electricity usage would refer to production equipment only, and not to general usage such as lighting.

Fuel and electricity usage per item produced could also be used to asses any decline in equipment operating performance.

A rising figure over time may suggest that equipment was becoming less efficient and was due for replacement.

These calculations apply to variable costs, where each input directly relates to the production of a single unit.

Labour costs per unit could also be calculated using the same approach.

For example, the following formula could be used.

$$\text{labour usage} = \frac{\text{number of hours worked}}{\text{number of items produced}}$$

For example, if a total of 1200 man-hours were worked during a period, and 150000 items were produced, then the following calculation would apply

$$\text{labour usage} = \frac{1200}{150000}$$

$$= 0.008 \text{ labour-hours per item}$$

A gradually rising trend may indicate that equipment was becoming less efficient and that production was becoming labour-intensive, or that staff levels were unnecessarily high.

However, this calculation could only be applied when the number of hours was directly related to the number of items produced.

In practice, costs relating to permanent employees may be a largely fixed, not a variable cost, while costs relating to overtime shifts, temporary, and contract staff may be variable costs.

4.8.4.1.5. Wastage and faults

The efficiency of a material usage could be calculated using the following formula

$$\text{materials usage efficiency} = \frac{\text{volume of material in finished products}}{\text{volume of material used}} \times 100$$

In the case of multiple different products, a more complex calculation may be needed.

For example, in the production of a range of different steel products, the volume of steel involved in each different product would need to be considered.

This calculation could be performed by summing the number of items of each product made, multiplied by the weight of each item.

This method could used to calculate the total weight of the steel in the completed products.

For example, the following three products may be produced during a production period

Product	Weight	Number
A	12	123
B	7	55
C	15	432

If the total weight of steel used during the period was 8500, then the efficiency of steel usage could be calculated using the following approach

$$\text{materials usage efficiency} = \frac{12 \times 123 + 7 \times 55 + 15 \times 432}{8500}$$

$$= 98.1\%$$

In practice, a manufacturing operation producing small steel items may carry thousands of different products, and computer software such as inventory management software or production management software may be used to generate statistics from the complete list of production runs during a period.

Custom-written software programs and general software packages, such as spreadsheet programs, may also be used to perform this type of analysis.

4.8.4.2. Plant analysis

Plant analysis may involve reviewing the type and efficiency of the equipment that is used in production.

A number of approaches could be used to review these issues.

This could include some of the following points.

4.8.4.2.1. Automation level

An automation level could be calculated to identify the amount of mechanical production involved in a production process, compared to the amount of manual processing involved.

Although equipment may have a high capital cost and an on-going depreciation expense, higher levels of automation generally lead to lower overall costs.

The automation level could be calculated using the following approach.

$$\text{automation level} = \frac{\text{depreciation}}{\text{depreciation} + \text{labour costs}} \times 100$$

In this calculation, depreciation would relate to production equipment and facilities only, and would not include depreciation of other assets such as buildings and storage facilities.

In the case of leased equipment, the lease payment could be split into an interest component and a depreciation component, with the interest component based on debt interest rates and the value of the equipment.

Labour costs would only include costs relating to production activities, rather than non-production staff costs.

An automation level of zero would indicate that a process was completely manual, with no machinery being used, while a level of 100% would indicate that the process was entirely automated, with no manual input to the process.

Power generation stations and chemical production plants typically have a high level of automation, while production of hand crafts may be entirely manual.

For example, in a situation where the depreciation expense was $10 and labour costs were $4, the automation level could be calculated using the following approach.

$$\text{automation level} = \frac{10}{10 + 4}$$

$$= 72\ \%$$

A gradual decline in the automation level may indicate that equipment was becoming less efficient, and that more manual input was being required in the production process.

4.8.4.2.2. Equipment age

The average age of equipment may be calculated to ensure that the facilities have not become out-dated.

This figure could be calculated using the following approach.

$$\text{average equipment age} = \frac{\text{sum of the age of each item}}{\text{number of items}}$$

For example, if three machines were installed, with ages of 9, 17 and 2 years, then the average age could be calculated using the following example

$$\text{average equipment age} = \frac{9 + 17 + 2}{3}$$

$$= 9.3 \text{ years}$$

In an operation that involved a large number of items of equipment, this figure should be reasonably stable if equipment was regularly replaced.

This calculation involves a direct average of the ages of each item, and does not involve a weighting due to the size of the item of equipment.

However, in the case of smaller machines, these items may have the same impact on production time as larger machines, and in fact a small machine may be more likely to cause a bottleneck in production than a larger machine.

4.8.4.2.3. Non-depreciating equipment

Equipment is generally depreciated over a time period that is equal to its estimated working life.

This involves the book value of the asset being reduced each period, with a depreciation expense being included in the profit and loss statement to reflect the reduction in value of the equipment.

It could generally be expected that the performance of a machine may be reasonable stable during this period.

After the end of the depreciation period, the value recorded for the asset declines to zero, and the depreciation expense ends.

However, the estimated life is often a conservative figure, and it is common for equipment to be continued in use for long after the depreciation period has finished.

This may cause no problem when the equipment is properly maintained.

However, eventually the equipment performance will deteriorate, and also the level of technology may fall behind the level of technology that is available in new machines.

Non-depreciation equipment refers to equipment that is used in production, but has passed the initial depreciation period of the estimated working life.

A large proportion of non-deprecating equipment may suggest that the overall production process has become inefficient, and that a major capital expenditure program may be needed.

In cases where a large number of items of equipment are used, the following formula could be used.

$$\text{non-depreciating equipment} = \frac{\text{number of non-depreciating machines}}{\text{total number of machines}} \times 100$$

For example, in an operation that involved 7 non-depreciating machines and 35 machines that were still within their depreciation period, the following calculation would apply

$$\text{non-depreciating equipment} = \frac{7}{35 + 7}$$

$$= 17\ \%$$

In cases where only a few items of equipment are used, a more relevant calculation may involve the proportion of the production process that was performed by non-depreciating equipment.

One approach to this calculation could use the following formula.

$$\text{non-depreciating equipment} = \frac{\text{variable costs used by non-depreciating equipment}}{\text{total variable costs}} \times 100$$

For example, if the cost of materials, electricity, and labour expenses involved with non-depreciating machines was $15, and total variable cost were $72, then the proportion of the production process than involved non-depreciating equipment could be calculated using the following approach

$$\text{non-depreciating equipment} = \frac{15}{72}$$

$$= 21\ \%$$

4.8.4.2.4. Occupancy Intensity

4.8.4.2.4.1. Capital intensity

An occupancy capital intensity figure may relate to the size and capacity of the production processes that were installed within a particular building or area.

In some cases, a large land area or building may be occupied by a business, with the business activity that is conducted being small in comparison to the land area.

In these situations, the overall returns from the business may be lower than an alternative business that occupied smaller facilities, or that used the full potential of the available area.

The capital intensity of building occupancy could be calculated using the following approach.

$$\text{ocupancy capital intensity} = \frac{\text{equipment \& facilities assets}}{\text{building occupancy costs}}$$

Equipment values & occupancy costs

In this calculation, the assets figure would include equipment and manufacturing facilities, and would not include general buildings being occupied, storage warehouses and other assets.

In the case of leased equipment, the value of the assets should be included within the asset value for the purposes of this calculation.

The building occupancy costs figure may include the costs of building leases, electricity for heating and lighting, cleaning, and building maintenance.

In cases where the building was owned, an equivalent rent level should be used to enable the calculation to be performed.

In the case of production facilities covering a large land area, the equivalent occupancy cost could be estimated from the land value.

A multiple may be applied to the land value to estimate an equivalent effective occupancy cost.

As an example, a multiple of 8% may be used as a rule of thumb.

In the case of a production facility occupying land with a value of $150, this would correspond to an effective occupancy cost of $12 per year.

This approach may allow the capital intensity of a wide range of different facilities and business activities to be compared.

A low or declining value for this figure may indicate that the business was occupying a large building area, but did not have significant production facilities installed within the building or land area.

4.8.4.2.4.2. Utilisation intensity

Although a business may have production facilities installed within a building or land area, these facilities may not be fully utilised.

The level of actual production and income that is generated from a facility may be calculated from the following formula

$$\text{occupancy utilisation} = \frac{\text{net profit}}{\text{building occupancy costs}}$$

High values of this figure may suggest that significant business activity was occurring within a facility.

In contrast, low or declining values may suggest that facilities were not being fully utilised, or that occupancy costs were unnecessarily high in relation to the business activity.

4.8.4.2.5. Comparisons

In the case of figures that are affected by the age and efficiency of equipment, a trend comparison over several years would normally be needed to determine a clear change.

Figures from previous years could be used as a base for comparison against current figures.

Some figures can be directly reviewed, such as the percentage automation level.

In many cases, however, a figure may have little direct relevance, unless it is compared to other figures.

This may involve figures from previous years, figures based on information published by major competitors, and averages for an industry.

Decisions involving the purchase of new equipment, and the construction of new facilities could also be reviewed on the basis of the before-and-after affect that the change may have on some of the previous figures.

4.8.4.3. Margins & financial analysis

4.8.4.3.1. Financial structure of production

Manufacturing is primarily an asset-based activity.

This is in contrast to service businesses, which may be cash flow based operations, and development activities, which are project-based.

Manufacturing operations can be assessed on an asset basis, or an income and expense basis.

The asset view may include the following details

Asset value	200
Net Profit	16
Return on Assets	8 %

This presents a static picture of the business operation.

Alternatively, an income-and-expense view can be taken.

This may include the following major items

Income		
	Sales	61
Expenses		
	Cash expenses	25
	Depreciation	20
	Total Expenses	45
Net Profit		16

The income-and-expense view presents a dynamic view of the business operations over a period of time.

The asset value is relevant in the context of the financial value of the assets.

In theory, the assets could be sold for the market value and the funds could be invested elsewhere.

However, the business value may be higher or lower than the asset value.

The business value is sometimes calculated as a multiple of net profit.

For example, a multiple of 14 times earnings may be used to value a particular business.

In this example, the business value would be calculated as the net profit value multiplied by 14.

This would correspond to a valuation rate of 7.1%, which would be equal to one divided by the valuation multiple.

In this case, the following figures would apply.

Asset View	
Assets	200
Earnings before interest	16
Return on Assets	8 %

Income-and-expense view	
Income	
Sales	61
Expenses	
Cash expenses	25
Depreciation	20
Total Expenses	45
Earnings before interest	16
Valuation Multiple	14
Valuation Rate	7.1 %
Business Value	224

4.8.4.3.2. Funding structure

The funding of the assets through a combination of debt and equity is a separate issue from the operational structure of the business.

The return-on-assets may be a particularly relevant figure for a manufacturing operation.

This figure records the net return from operating the capital assets, ignoring any funding issues.

In the case of leased assets, the value of the equipment should generally be included within the total assets figure for the purpose of calculating a return-on-assets figure, to enable effective analysis and comparisons to be carried out.

In cases where debt was used, the return on equity would be higher than the return on assets when the return on assets exceeded the interest rate on the debt, and otherwise it would be lower.

This affect is illustrated in the following formula, relating the return-on-assets to the pre-tax return-on-equity.

In this formula, the gearing rate "g" is equal to the debt value divided by the total assets.

$$ROE = ROA + \frac{g}{1-g}(ROA - debt\ interest\ rate)$$

4.8.4.3.3. Production leverage

The income and expense structure of a manufacturing business can be broken down into the following parts.

Income	**Expenses**	
Sales	Net Profit	
	Variable cash expenses	
	Fixed cash expenses	----| total fixed
	Depreciation	----| costs

The fixed costs remain the same in each period, regardless of the level of production and sales.

The variable cash expenses and the net profit vary with the level of sales.

The term "production leverage" could be used to refer to the effect that the percentage change in the net profit is larger than a percentage change in sales, due to the fact that a proportion of the cost base does not change as the level of sales changes.

The production leverage could be calculated using the following formula

$$\text{production leverage} = \frac{\text{num units} \times (\text{unit sale price} - \text{unit variable cost})}{\text{num units} \times (\text{unit sale price} - \text{unit variable cost}) - \text{fixed costs}}$$

For example, in the case of the following figures, the production leverage could be calculated using the previous formula.

Number of units	1000
Unit sale price	1.20
Unit variable cost	0.50
Fixed Costs	500

$$\text{production leverage} = \frac{1000 \times (1.2 - 0.5)}{1000 \times (1.2 - 0.5) - 500}$$

$$= 3.5$$

A rise or fall in sales at this level of production would lead to 3.5 times the percentage change in net profit.

The production leverage is not a fixed value, and the leverage rate changes with the level of production.

The following graph illustrates the cost per unit, net profit, and production leverage than may occur at various levels of production.

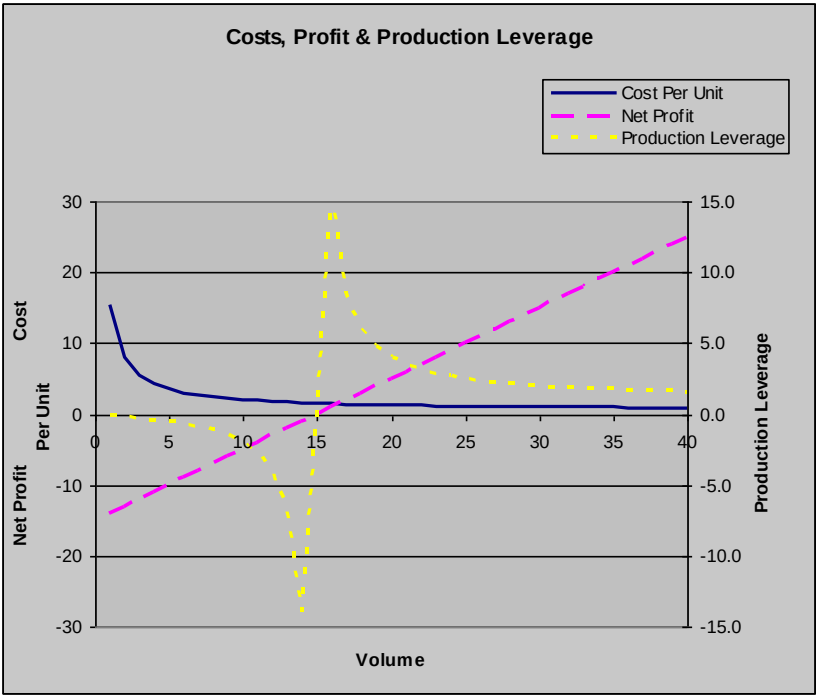


Figure 3

4.8.4.3.4. Margin & return analysis

4.8.4.3.4.1. Margins and Returns

The format below illustrates one possible layout for a summary analysis of the margins from a manufacturing operation.

These figures could be calculated for individual products, and also for the complete production volume using total amounts and using weighted averages for per-unit figures.

Margins and returns can be analysed to determine rising or falling trends over time, compared with industry averages, and compared against base levels for investment returns and other parameters.

These figures could also be used to review possible projects and alternative facilities or processes, and to review the affect that updating equipment and other changes may have on the manufacturing operation.

	Production	Design Capacity
Unit sale price	1.20	
Unit variable Cost	0.55	
Number of units	123	150
Sale value	147.60	180
Fixed Costs	70	70
Fixed Cost per unit	0.57	0.47
Total Cost per Unit	1.12	1.02
Variable Costs	67.65	82.5
Total Costs	137.65	152.5
Net sales value	9.95	27.5
Production margin	54 %	54 %
Sales Margin	6.7 %	15.3 %
Capacity Utilisation	82 %	
Asset Value	190	190
Return on Assets	5.2 %	14.5 %

Notes:

sales value = unit sale price x number of units
variable costs = unit variable cost x number of units
total costs = fixed costs + variable costs
production margin = (unit sale price – unit variable cost) / unit sale price
sales margin = (sales value - total costs) / sales value
capacity utilisation = number of units / design capacity

Sales value represents the value of the items produced, rather than the income received from actual sales during the period.

Income from sales may be higher or lower than production, depending on whether stocks of completed goods where increased or depleted.

The figures for design variable costs are based on current actual variable costs from production, rather than expected costs at a previous time.

Design fixed costs are based on the current fixed cost level, allocated across the design capacity.

4.8.4.3.4.2. Production margin

The “production margin” in this case relates to the difference between the sale prices and the variable input costs.

The production margin in this example is calculated as the percentage of the sale price of an item that is retained, after paying the direct costs of producing the item.

This involves the efficiency of the production process and the sale prices.

The production margin involves the amount of raw materials used in production, and the difference between the prices of sold items and the cost of supplies.

The production margin does not involve the capital cost of the equipment and facilities, and it is not affected by the level of production.

The production margin can be calculated using the following formula

$$\text{production margin} = \frac{(\text{sale price per unit} - \text{variable cost per unit})}{\text{sale price per unit}}$$

4.8.4.3.4.3. Sales margin

The “sales margin” is defined in this example as the net margin received by the business.

The sales margin includes the allocation of fixed costs, such as the depreciation of the capital facilities, across the production level that occurred during the period.

The sales margin is affected by the production margin, the volume of production, and the capital cost of the facilities.

$$\text{sales margin} = \frac{\text{num units} \times (\text{sale price per unit} - \text{variable cost per unit}) - \text{fixed costs}}{\text{num units} \times \text{sale price per unit}}$$

4.8.4.3.4.4. Return on Assets

The return on assets is the net profit from operations, before funding costs such as interest, as a percentage of the asset base.

This can be used to asses the efficiency and production levels of the manufacturing operation, and also to compare the returns against alternative uses for the asset capital.

The return on assets figure can be calculated using the following formula

$$\text{return on assets} = \frac{\text{earnings before interest \& tax}}{\text{assets}}$$

An alternative formula, listed below, highlights some of the variables and issues that may affect the return on assets figure.

$$\text{ROA} = \text{sales capacity} \times \text{production margin} \times \text{capacity utilisation} - \text{fixed cost ratio}$$

In this formula, each of the terms is defined in the following way.

$$\text{sales capacity} = \text{sales price} \times \frac{\text{design volume}}{\text{assets}}$$

$$\text{fixed cost ratio} = \frac{\text{fixed costs}}{\text{assets}}$$

$$\text{capacity utilisation} = \frac{\text{number of units produced}}{\text{design volume capacity}}$$

Three alternative formulas for calculating the net profit are listed below.

Each formula highlights a different set of issues affecting the net profit result

$$\text{net profit} = \text{num sales} \times (\text{sale price per unit} - \text{variable cost per unit}) - \text{fixed costs}$$

$$\text{net profit} = \text{production margin} \times \text{sales value} - \text{fixed costs}$$

$$\text{net profit} = (\text{sale price per unit} - \text{variable cost per unit}) \times \text{capacity utilisation} \times \text{design capacity} - \text{fixed costs}$$

4.8.4.3.4.5. Calculations based on multiple products

In most cases, a range of products would be produced.

The previous margin analysis could be performed for each individual product, and also for the full production volume by using weighted averages.

Weighted average figures could be used for figures that related to a single unit.

In this context, a "weight" does not refer to a physical weight.

The weight of an item in this context refers to the importance of the item within the average, and the size of the impact that an individual item would have on the total figure.

For example, if a business had one debt with a value of $100 and another debt with a value of $15, the interest rate on the first debt would have a greater impact on the total interest cost than the interest rate on the second debt.

The average sale price per unit could be calculated using the following formula.

$$\text{sale price} = \frac{\text{sum of the "sale price} \times \text{number of units" for each product}}{\text{total number of units}}$$

For example, the following items may be produced during a period

Product	sale price	Quantity

A	1.23	345

B	0.64	45

C	3.34	565

The weighted average sale price could then be calculated using the following example.

$$\text{sale price} = \frac{1.23 \times 345 + 0.64 \times 45 + 3.34 \times 565}{345 + 45 + 565}$$

$$= 2.45$$

The use of weighted averages would allow the cost-per-unit and margin calculations to be performed across the full volume of production during a period.

4.8.4.3.4.6. Fixed & variable costs

Manufacturing costs can be are broken into two categories; fixed costs and variable costs.

Fixed costs may include deprecation, building rents, and general expenses such as administration.

These are costs that are fixed dollar amounts and do not vary as the volume of production changes.

Variable costs may include raw materials, fuel and electricity, and in some cases labour costs for overtime, temporary and contract workers.

The total variable cost changes with the volume of production.

Variable costs are a fixed amount per item, while the fixed costs are a fixed amount for each period of time.

The average cost-per-unit is based on the total of the fixed and the variable costs that were incurred during a period of time.

The proportion of fixed to variable costs

In general terms, high capacity equipment and automated facilities may have high fixed costs and low variable costs, while low capacity facilities and manual processes may have high variable costs and low fixed costs.

The proportion of fixed to variable costs determines the leverage of net profit to changes in production levels.

A business with a high proportion of fixed costs may have a high leverage to rising or falling sales, while a business with a high proportion of variable costs may experience a gradual change in profit as sales rise or fall.

For example, the table below shows the figures for two different combinations of fixed and variable costs

	Operation A	Operation B
Sale Price Per Unit	10	10
Fixed Cost	100	1000
Variable Cost Per Unit	5	3
Production Volume	Net Profit	Net Profit
0	-100	-1,000
1	-95	-993
10	-50	-930
100	400	-300
1,000	4,900	6,000
10,000	49,900	69,000
100,000	499,900	699,000
Break-even Production Volume	20	143

The break-even sales volume can be calculated using the following formula

$$\text{break-even sales volume} = \frac{\text{fixed costs}}{\text{sale price per unit} - \text{variable cost per unit}}$$

In this example, operation A has lower fixed costs than operation B, but higher variable costs.

This table illustrates two key points.

In this example, the break-even point is higher for the operation with the higher fixed costs than for the operation with the high variable costs.

This break-even point for each operation would depend on the level of the fixed and variable costs.

However, in general the break-even production level would be higher in a facility with a high proportion of fixed costs, in comparison to a facility with a high proportion of variable costs.

In all cases the operation with the high fixed and low variable costs would have a higher production leverage that the alternative operation.

When sales were low, the loss would be greater in an operation with high fixed costs, while when sales are high, the profit would be greater in the high-fixed-cost operation than in the high-variable-cost operation.

In other terms, if a large investment is made in high capacity equipment, then a high leverage of profit levels to sales volumes may be created.

Costs per unit

The fixed cost per unit can be calculates using the following formula

$$\text{fixed cost per unit} = \frac{\text{fixed costs}}{\text{num units}}$$

This formula could also be expressed using the capacity utilisation rate, as in the following formula.

$$\text{fixed cost per unit} = \frac{\text{fixed cost}}{\text{design volume} \times \text{capacity utilisation}}$$

The total cost per unit can be calculated using the following formula

$$\text{cost per unit} = \text{variable cost per unit} + \frac{\text{fixed costs}}{\text{num units}}$$

For example, if the variable cost was 1.45 per unit, and the fixed cost were 12,000, and the capacity utilisation was 75%, then the total cost per unit could be calculated using the following example

$$\text{cost per unit} = 1.45 + \frac{12000}{15000}$$

$$= 2.25$$

This formula could also be expressed in terms of capacity utilisation, as described in the following formula

$$\text{cost per unit} = \text{variable cost per unit} + \frac{\text{fixed cost}}{\text{design volume} \times \text{capacity utilisation}}$$

The following table presents the variable cost, fixed cost, and total cost for a single unit at various levels of production

Production Level	Variable Cost	Fixed Cost	Total Cost
10%	1.45	6.00	7.45
20%	1.45	3.00	4.45
30%	1.45	2.00	3.45
40%	1.45	1.50	2.95
50%	1.45	1.20	2.65
60%	1.45	1.00	2.45
70%	1.45	0.86	2.31
80%	1.45	0.75	2.20
90%	1.45	0.67	2.12
100%	1.45	0.60	2.05

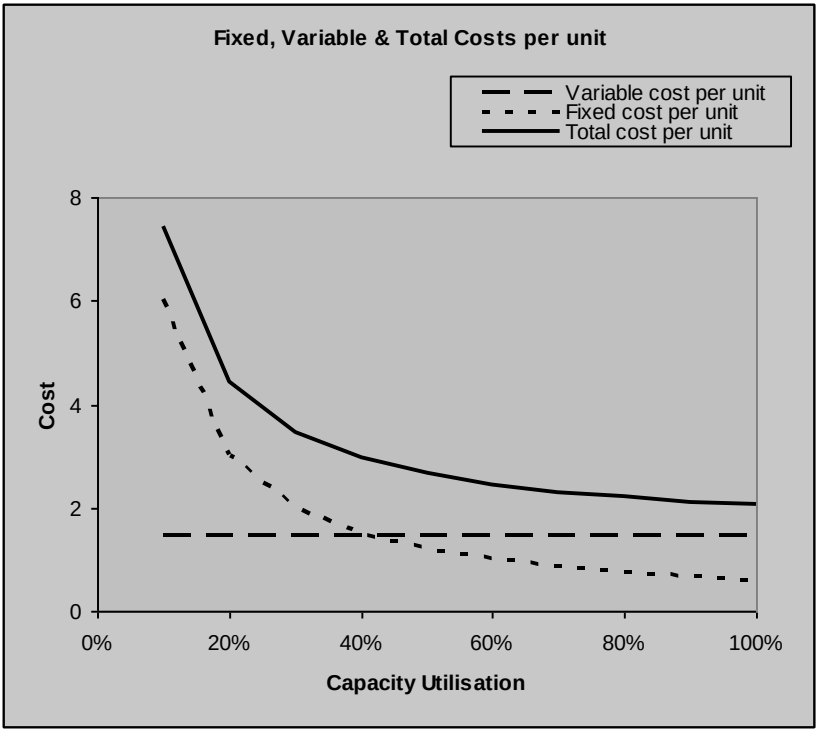


Figure 4

As illustrated in the graph above, the cost per unit declines with increasing capacity utilisation as a curve, not a straight line.

Costs are reasonably stable at high levels of production, however the cost-per-unit rises rapidly at low production levels.

The actual extent of the curve would depend on the proportion of fixed and variable costs.

A facility with a high proportion of variable costs would have a shallow curve, with costs varying gradually at different production levels.

In the case of high-capacity plants with a large proportion of fixed costs, a steep curve may apply, with large differences in cost-per-unit at different production levels.

4.8.5. Creating the manufacturing process

4.8.5.1. Plant design

4.8.5.1.1. Project developments

The design of a new manufacturing facility involves en engineering design process.

From the perspective of the business analysis, some of the following attributes of a manufacturing facility may be relevant.

- The capital cost of the project.
- The expected lifetime of the facility
- The production capacity, such as the number of units per month.
- The type and volume of raw materials required.
- The type and amount of other supplies involved, such as electricity and gas supplies.
- The cost per unit of production, assuming an average medium-term price for raw materials.
- The cost per unit at varying production levels, such as operations occurring at half design capacity.

In some cases, a manufacturing facility is built as a single project, maintained and operated, and eventually closed.

These situations occur with power generation facilities, chemical production plants, and so on.

The capacity of various stages in a project facility is generally balanced, and the plant may be designed to a specific rated production volume capacity.

In these situations, general maintenance and repairs may be involved, along with the occasional replacement of individual items of equipment.

However, the operating performance of different sections of the plant may deteriorate at a similar rate, and when the operating performance of the plant had deteriorated significantly, the entire plant may be closed and a new facility may be developed.

4.8.5.1.2. Evolved plants

In the case of general manufacturing, an individual site may be used over a long period of time.

In these cases, a wide range of equipment of varying capacities and ages may be installed.

In situations such as this, the design of the plant and the facilities may need to be reviewed on a regular basis.

In cases where a facility had changed many times since it was first built, a number of issues may arise.

Estimating capacity

Industrial machinery is generally rated to a particular capacity.

For example, a printing machine may be rated at 10,000 pages per hour, with an expected lifetime of 8 years, and a duty cycle of 200 hours operation per month.

In the case of a project development, an entire facility may be rated at a particular design capacity.

However, in the case of general manufacturing, estimating the capacity of a complete production process may be a complex exercise.

A large section of the analysis of production and the financial structure of a manufacturing operation involves calculations based on the maximum capacity of the process.

This figure can be estimated from the rating of each individual machine in the process, together with time allocations for equipment setup for production runs, scheduled maintenance, and so on.

This would allow the maximum throughput to be calculated.

This figure may then form the reference point against which calculations such as fixed costs, capacity utilisation and so on could be performed.

Aligning the capacity of process stages

Estimating the process capacity may highlight situations where parts of the process may have differing capacities.

If large differences occur, then improvements in efficiency may be possible by increasing the capacity of slow stages, to allow the high-capacity sections of the process to be fully utilised.

Outdated equipment

In an evolved facility, individual machines may vary widely in age, and in some cases an individual machine may be outdated and may delay the entire production process.

This may also involve additional expenses from frequent maintenance, a high level of manual input, and re-working of faulty products.

In these cases a significant improvement may result from replacing a component of the process with new equipment.

4.8.5.1.3. Small enterprises

In the case of small manufacturing operations, plant design may involve selecting the items of equipment to be used.

A large machine that performed several functions may result in efficient production.

However, high capacity equipment may also have a high capital cost.

Advantages with using several smaller machines may include that fact that greater flexibility may be achieved, and also that the individual machines could be bought or sold in stages.

4.8.5.2. Process design

Process design involves selecting the equipment to be used, and designing the operating process.

In many cases a wide range of equipment may be available for manufacturing operations, with varying capacities, and performing various different functions.

A single machine that performed several different functions would generally allow for more efficient production than several individual machines.

However, this may also be a less flexible arrangement than individual machines, as in some operations the facilities required of each stage may be different to the machine facilities, depending on the other processes involved in production.

A large number of steps may be involved from the point at which raw materials arrive, to the point at which the goods are completed and ready for shipping.

An existing production process could be reviewed by checking some of the following issues.

- The time taken to complete each stage in the process.
- The proportion of time spent with equipment operating, compared to time required for equipment set-up, transporting supplies, and so on.
- Identifying any stage that prevented previous stages from operating at full capacity.
- The fault rate occurring at each stage.
- The costs of each stage in terms of raw materials, manual input, storage space, fuel etc.

Attention to the complete process, including the equipment involved in each stage, and the processes used to complete the production, may have a significant impact on capacity and costs.

For example, although the capacity rating of a machine may set the maximum process capacity, the actual capacity of the complete process may be significantly lower than the machine capacity, due to the other steps involved in a complete production cycle.

For example, a machine may have a capacity of 2,000 units per hour.

If the machine operated for two hours, while materials transport, set-up and other activities required one hour, then the capacity of the production process would be 1,333 units per hour, not 2,000 units per hour.

The capacity of a production process using a single machine can be calculated using the following formula

$$\text{production capacity} = \text{machine capacity} \times \frac{\text{average run time}}{\text{average run time} + \text{average down time}}$$

In the previous example, the following calculation would apply

$$\text{production capacity} = 2000 \times \frac{2}{2+1}$$

$$= 1{,}333 \text{ units per hour}$$

Changes in processes may allow machines to operate uninterrupted for long periods of times, with short down-time periods between production runs.

4.8.5.2.1. Fault rates

Fault rates may be a significant issue in the design of a manufacturing process.

A fault may involve a faulty product.

Also, this issue may arise in the case of production stoppages, which may reduce capacity and increase costs.

Faults may include some of the following items

- Products that are misshapen or incorrectly formed.
- Products that are outside manufacturing tolerances.
- Production stoppages.

Faults may be caused by some of the following issues.

- Worn-out equipment, which may jam, mis-stamp items or produce faulty goods in other ways.
- Mistakes in setting up equipment, such as mistakes in installing moulds, or setting machine parameters for a production run.
- Processes that are excessively labour-intensive or poorly designed.
- Poor quality raw materials.
- Machines being used incorrectly.

For example, poor quality raw materials may create a number of potential problems.

This may lead to machines jamming, quality problems in chemical or material production, and products being created with dimensions or performance that may be outside the product design tolerances.

Also, materials may have a certain proportion of faulty items or batches within the material itself.

4.8.5.2.1.1. The natural fault rate of a process

The fault rate of a process is determined when process is design and created, not by the way the process is operated.

Of course, a process cannot produce its design potential unless it is operated correctly.

However, a machine that produces three faults per million items will never produce three faults per hundred if everything is operating properly, and a machine that produces three faults per hundred will never produce three faults per million.

No process has a fault rate of zero.

Just as human error occurs at random moments, machines and production processes also generate a percentage of faulty outputs.

High capacity machines and facilities may be rated at a certain average fault rate, such as 20 faults per million items produced.

Faulty items may require a considerable level of manual input to correct and re-work the item, they may halt production for a period of time, and the process for re-working faults may fill a significant section of the facility.

Fault rates may be reduced by ensuring that equipment is replaced as soon as its operating performance begins to deteriorate significantly.

Also, continuous processes generally have lower fault rates than batch processes.

A machine that performs several functions may reduce the fault rate in some circumstances, compared to using several individual machines.

A large increase in production efficiency may sometimes occur through reviewing fault rates at each stage of the production process, and replacing equipment or addressing process problems where faults cause a bottleneck in production.

4.8.5.2.1.2. Measuring fault rates

A fault rate may not be able to be effectively managed unless it is measured over an extended period of time.

For example, the number of faults may be recorded for each production run, as a standard operating statistic.

A percentage of faulty goods could then be calculated from the number of faults and the total number of items produced.

In the case of production stoppages, both the number of stoppages and the total length of time may be recorded.

Addressing faults on an ad-hoc basis may not result in a permanent change to the business activity or operational processes.

Measuring faults may enable an assessment to be made as to whether new items of equipment, or new processes, may have improved the fault rate.

Also, this process may allow fault rates to decline continuously over time, as new steps may be taken at each point to establish a further reduction in fault rates.

During the 1970's (**check decade), an approach known as "total quality management" become popular within manufacturing operations.

This approach raised fault rates as a major issue of production.

Through a range of changes over time, some manufactures were able to reduce fault rates from the order of one fault for every few hundred items, to a few faults for every million items produced.

These changes lead to large increases in production efficiency and capacity, and significant reductions in costs-per-unit in a range of cases (**check details).

4.8.5.2.1.3. Reducing fault rates

A number of steps may be taken that may reduce fault rates. This may include some of the following points.

- Sourcing good quality raw materials, and testing material batches before use.
- Using continuous production processes rather than batch processes.
- Ensuring that equipment is used correctly.
- Replacing worn-out equipment.

- Replacing several production stages by a single machine or a link between machines.
- Automating processes that were previously performed manually.
- Ensuring that equipment is correctly maintained, and regularly adjusted.
- Measuring fault rates as permanent production statistics, and taking regular steps to reduce the structure of the fault rate within the production process.
- Altering production procedures, such as altering supply transport and loading methods, or performing long production runs or related runs in related batches.

4.8.5.2.2. Plant efficiency

Plant efficiency involves the amount of raw materials that are required to produce a certain volume of output.

This also involves the fixed costs of the plant itself, and the level of expenses such as staff costs, that are required in proportion to the volume of output produced.

A range of conditions must be in place for a plant to operate efficiently.

This includes efficient equipment, a well designed plant structure and operating processes, and effective production management.

Problems in any of the relevant areas may prevent the plant from operating effectively.

The plant efficiency can be measured as the total cost per unit when the plant is operating at full capacity.

4.8.5.2.3. Bottlenecks

Bottlenecks occur when a particular stage in a production process causes a significant reduction in the potential throughput of the process, or causes a significant increase in costs.

This may occur due to some of the following causes

- A worn-out item of equipment.
- A machine that does not have sufficient capacity in relation to the rest of the process.
- A stage in production involving a large amount of manual input, that could potentially be automated.
- A poorly design or managed production process.
- Co-ordination and timing problems, such as shortages of materials, different parallel stages in the process completing at different rates, and so on.

Removing a bottleneck may increase capacity significantly and also reduce costs.

4.8.5.2.4. Continuous vs. batch processes

Continuous processes involve a process that processes a large number of items continuously over an extended period of time.

In theory, a continuous process could operate at full capacity indefinitely, as long as supplies were continuously available and output items were removed and stored.

In contrast, batch processes involve a production run that produces a specific number of items.

Batch processes are used in small scale manufacturing, and when a large number of different products are made.

Examples of batch production include the manufacture of nuts, bolts and other small items, where several thousand different products may be stocked.

Continuous production is used in high volume manufacturing, processes such as chemical production, and where a small number of product designs are involved.

Continuous processes generally have significantly lower costs and fault rates than batch processes, and may produce a larger volume of items over a period of time.

Batch processes require setting up of equipment in preparation for a production run, loading materials, and transferring finished items to the next stage in the process.

Where possible, implementing continuous processes within a production environment may lead to significant increases in efficiency.

For example, where several machines are linked together into a single chain, processing the items may involve less down-time and fewer faults than operating each stage separately.

4.8.5.2.5. Split facilities

Split facilities are used when a function is performed by several small machines rather than a single large machine.

Although a large capacity machine would generally have lower costs per unit than a small machine when operating at full capacity, there may be several advantages with using split facilities.

Most machines operate at maximum efficiency when they are operating near full capacity.

In a similar way to complete production processes, there are fixed and variable components within the materials and fuel used by machines.

Although a large machine operating at full capacity may have lower costs per unit a smaller machine, when production is only occurring at half capacity, a smaller machine may provide more efficient production.

When production levels are low, the use of a single small machine may produce a more efficient result than using only part of the capacity of a large machine.

This arrangement is common in power generation facilities, for example.

A gas-fired power generation facility may contain three gas turbines, rather than a single large turbine.

In some manufacturing plants, entire sections of the plant are duplicated, and sections of the plant can be closed when production levels are low.

Another advantage of this arrangement relates to back-up facilities.

When a single machine or process stage is used, production may be halted in the event that a fault develops in the process.

This may cause a major problem when an extended period of time is required to restore the machine or facility to an operational condition.

When several items of equipment are used, production may be able to continue when one item is unavailable due to a fault, or is unavailable due to maintenance activities.

4.8.5.2.6. Parallel & series processes

The production of an individual item generally involves a number of separate operations.

Series processes involve a set of stages that are performed in sequence, with an item passing from the first stage to the second stage, then the third stage and so on.

Parallel processes involve several independent activities occurring at the same time.

For example, an item of equipment may be constructed from three major sections.

A series process may begin with the first section being constructed.

The partially completed item may then pass to the second stage for completion of the second section, and finally to the final stage for completion of the finished product.

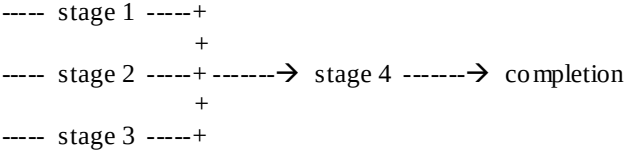
A parallel process may involve all three sections being independently constructed at the same time.

A fourth stage would then involve assembling the three sub-sections into a finished product.

This can be illustrated using the following diagrams

Series process

Parallel process



The choice between a series and a parallel process may not significantly alter the activity that occurs within each individual stage, nor may it alter the total costs or the volume capacity of the process.

However, a parallel process reduces the time taken to complete a specific item.

For example, if each stage required 10 days to complete, then a series process would require 30 days to complete an individual item, while a parallel process would require only 10 days.

This reduction in processing times may be of benefit in producing specific custom products based on client orders.

This approach may be particularly relevant in business operations where all the items are built according to specific client orders.

Building construction is one example of this situation.

In these cases, the use of a parallel approach may lead to considerable savings in interest costs by significantly reducing the time taken to complete a project.

Within manufacturing, a parallel approach may allow the business to supply specific orders more quickly, and to reduce the delays involved in responding to changing levels of sales demand.

In the case of an individual item, the time involved in producing an item through a series process would be the sum of the total times required in each stage.

Within a parallel process, the time delay would be equal to the time required for whichever stage required the longest time period to complete.

For example, the following stages may be involved in a production process.

Stage	**Time Involved**
1	3
2	9
3	5
4	7

Series process time	24
Parallel process time	9

In the case of continuous production, all the stages would need to have the same production rate, regardless of whether a parallel or a series process was involved.

In cases where the potential capacity of each stage was different, the process capacity would be set by the stage that had the lowest production rate.

This situation would apply whether a series or a parallel process was used.

4.8.5.2.7. Fault tolerance

Parallel processes may also provide a level of fault tolerance to the production process.

When a stage within a series process is halted, this may prevent all further stages from operating.

Earlier stages could continue operation, up to the point that was determined by the storage space available mid-way through the process for partially completed items.

A similar situation may occur in a parallel process.

A product cannot be assembled and completed until all the individual components are available.

However, in the case of a parallel process, other components of the process could continue operation when a single stage was halted.

This is in contrast to a series process, where only the earlier stages could continue operation.

This operation would be limited by the amount of storage space that was available to store the output of each individual stage, until the final assembly process could be re-started.

4.8.5.2.8. Attended & Unattended processes

Some machines and processes may involve an operator loading each individual item, and selecting functions for the processing of each item that is processed.

Other machines and processes can operate continuously for long periods of time without human involvement.

This may occur when large capacity input storage is used for raw materials, when conveyer systems are used to transport items from one machine or process stage to the next, and when automatic selection of process options is performed by machines or process control equipment.

Unattended processes may have a range of advantages over attended processes.

Production volumes and quality control may be higher with unattended processes than with manually operated processes.

Operating costs may be lower with unattended systems than with attended systems, as an employee may not need to be permanently stationed at each machine or process stage.

Also, disruptions to production flow due to issues such as breaks and shift changes may be reduced.

Where possible, equipment and processes that support unattended operation should generally be used, in preference to processes that require continuous manual input.

This approach may lead to large increases in production capacity, and reduced costs and fault rates.

4.8.5.3. Economies of scale

Economies of scale are a fundamental component of manufacturing.

An economy of scale may occur when the cost for producing a single unit of a product is lower when high volumes are produced than when low volumes are produced.

This may be a general effect within manufacturing, and may occur for two reasons.

The cost-per-unit of production may be lower in the case of high capacity equipment, than in the case of low capacity equipment.

For example, a printing machine that has a capacity of 10,000 pages per hour may print each page at a lower cost than a machine that has a capacity of 1,000 pages per hour.

This may involve lower costs of electricity, depreciation, maintenance and so on, when the costs are allocated to a single page of printed output.

This is the nature of mechanical equipment.

A second effect may involve the fixed costs of the business operation.

Costs such as marketing and administration costs may be a constant figure, regardless of the level of production and sales.

For example, the same costs may be involved in processing an invoice for $100, as processing an invoice for $10.

In the case of marketing expanses, as another example, a similar cost may be involved in negotiating a supply agreement for 5,000 units, as a supply agreement for 1,000 units.

The cost per unit may be derived from the variable costs, such as the raw materials, and a pro-rata allocation of the fixed costs.

For example, a business may have the following costs under two different production volumes

	Low Volume	High Volume
Volume	10	40
Fixed costs	120	120
Variable cost per unit	5	5
Fixed cost per unit	12	3
Total cost per unit	17	8

In this example, the cost for producing each unit drops from $17 to $8 as the volume of production is increased, without any change occurring in the facilities, materials or processes.

Economies of scale may also apply in the case of some service businesses and other types of business activity.

For example, the cost of computerised processing and administration systems may be a fixed value, while variable costs may apply to processing volumes.

In the case of managing transactions, such as investment management, project management and so on, many activities and costs may be constant, however the fee income may vary with the size of the transaction.

In the case of licensing items such as designs, computer software, music and so on, the costs may be largely fixed, however the income may increase with the level of sales.

In any situation in which a portion of the costs may be fixed, and may not vary with the level of sales, then economies of scale may apply.

4.8.5.4. Costs Vs. Volumes

The combination of low costs per unit for high capacity equipment, and allocating fixed costs across a large number of units, may result in costs per unit declining in the case of high production volumes, or high capacity facilities.

One approach to modelling costs may involve a cost per unit that falls in line with a curve that is based on the volume raised to the power of a particular number.

Figure 2 on page 499 illustrates the decline in cost per unit with increasing volume, based on a polynomial curve.

This curve has the property that the value declines by a constant figure for each proportional change.

For example, the costs may decline by the same percentage each time that the production capacity was doubled.

In the case of one rule of thumb that may be used, the cost per unit may fall by 40% each time that capacity is doubled (** check)

(** check rules of thumb/typical ratios)

For example, when capacity was increased from 10 to 20 units, or from 5,000 to 10,000 units, the cost per unit may fall be 40% in each case.

4.8.5.5. Scale calculations

An estimated cost per unit of production at varying production volumes may be calculated using a polynomial curve relationship

The cost per unit of production may be represented using the following formula

$$\text{cost per unit} = a \times \text{volume}^{\,b}$$

The function of raising one number to the power of another number may be represented in the form y^x.

This function may be available in some calculators that may include scientific or financial functions, and in computer software such as spreadsheet programs.

In order to estimate costs at different production levels, an estimate must be made for the values of "a" and "b" in the previous formula.

This may be done in several ways.

Where the costs may be estimated at two different levels of production, the following formulas may be used.

$$b = \frac{\ln\left(\frac{\text{cost 2}}{\text{cost 1}}\right)}{\ln(\text{volume 2}) - \ln(\text{volume 1})}$$

$$a = \text{cost 1} \times \text{volume 1}^{-b}$$

In these formulas, the variables have the following meanings.

cost1	The total cost per unit at production level 1
cost2	The total cost per unit at production level 2
volume1	The number of units at production level 1
volume2	The number of units at production level 1

In the formula for “b”, the function “ln” is the natural logarithm of the value, and is available within some calculators and software programs.

For example, the following figures may be available

Volume	Cost per unit
10	4.72
30	1.16

Applying the previous formulas, the following values may be calculated for “a” and “b”

$$b = \frac{\ln\left(\frac{1.16}{4.72}\right)}{\ln(30) - \ln(10)}$$

$$= -1.28$$

$$a = 4.72 \times 10^{-1.28}$$

$$= 90$$

Alternatively, only a single set of values for current costs and production levels may be available.

In this case, a value may be estimated for the value of “b”.

This may be based on a rule-of-thumb approach, or it may be calculated from a set of costs and volumes of several different businesses that may operate within an industry.

For example, one rule of thumb that may be used in manufacturing may involve costs falling by 40% each time that production capacity is doubled (** check).

In this case, this may correspond to a value of -0.74 for “b”.

Using this value of "b", the value of "a" for the formula may be estimated from the current cost and volume figures using the following approach.

$$a = \text{cost per unit} \times \text{volume}^{0.74}$$

For example, a production facility may currently produce 5,000 units per month, at a total cost of $7,000.

The current cost per unit may be determined from the following formula

$$\text{cost per unit} = \frac{\text{total costs}}{\text{number of units}}$$

$$= \frac{7000}{5000}$$

$$= 1.40$$

The value of "a" may then be estimated using the following example

$$a = 1.40 \times 5000^{-0.26}$$

$$= 764$$

Having estimated values for "a" and "b", the cost per unit and the total costs may be estimated for a range of larger production facilities.

For example, although production levels in the previous example were currently 5,000 units per month, an expanded facility may be available for purchase that may enable production volumes to be increased to 20,000 units per month.

In this case, the cost-per-unit of the expanded facility may be estimated using the following example.

$$\text{cost per unit} = a \times \text{volume}^{b}$$

$$= 764 \times 20000^{-0.74}$$

$$= 0.5$$

Also, the total costs may be estimated using the following approach

$$\text{total costs} = \text{cost per unit} \times \text{volume}$$

$$= 0.5 \times 20{,}000$$

$$= 10{,}000$$

This example illustrates, that using the assumption for the shape of the curve and the rate of decline, the cost per unit may fall from $1.40 to $0.50 in the previous example if the new facility was purchased, enabling production to increase from 5,000 units per month to 20,000 units per month.

4.8.6. Managing manufacturing

The efficiency of production relates to the amount of raw materials that are needed to produce an item, the volume that can be produced from equipment of a certain value, and the reliability and quality of output.

Efficient production requires equipment that is up-to-date and suitable for the production process, effective procedures and processes, and effective production management.

4.8.6.1. Process control hardware

Process control equipment involves computer equipment used to control flow rates, temperatures and pressures, transport of items between process stages, and so on.

Process control equipment is particularly used in high capacity continuous production, where accuracy is critical, and in production that involves a wide range of variables, such as oil refining facilities.

The use of process control hardware and software may lead to significant improvements in quality levels and production capacity, and reduce the amount of raw materials that are required to produce a particular volume of output.

Process control is heavily used in production facilities that are developed as an integrated facility on a project basis.

However, process control can also be implemented within general manufacturing operations.

This may include operations such as automatically recording volumes to record production information, automatic transfer of items using conveyor systems, and automatic selection of machine options for different types of materials and products.

4.8.6.2. Managing production

The aims of production management may include some of the following points:

- Minimising the materials and resources that are required to produce a certain volume of products.
- Ensuring that the quality standards of the finished products are high.
- Maximising the potential production volume available from a facility, to enable high production levels to be maintained when sales demand is high.
- Maintaining a flexible and variable cost structure, so that high fixed costs are not incurred during periods of slow sales.
- Reviewing product volumes, profitability, and plant efficiency, as an input into decisions to change product structures and to re-invest in updated facilities.

Managing production may involve scheduling production runs, organising maintenance, and designing production processes.

In many cases, the requirement for products will be set by customer demand, and this will then lead to the requirements for production.

However, the customer demand itself is related to the price of the products.

Effective production management may enable a large volume of goods to be produced within a particular period of time.

This may reduce the cost of each item, which could feed through into increased sales.

4.8.6.2.1. Scheduling

Scheduling production runs is a major component of production management in many manufacturing operations.

This includes planning the order, length and starting time of various production runs, organising employee shifts, and ensuring that processes are not delayed due to a shortage of materials or other processes not being completed.

Production runs should generally be scheduled so that there is a minimum of equipment set-up required when changing from one product to another.

In some operations, the scheduling order of tasks may affect the delay and changes required between each production run.

In general, one long production run may be more efficient than several shorter runs.

This may reduce the set-up time required for the equipment, and may also reduce the time involved in the overall process, such as locating the relevant supplies and transporting materials.

However, this may need to be balanced against the fact that a long production run may require more raw materials and higher inventory levels that using short production runs, and may also require more storage space for the completed products.

Maintenance of equipment may be scheduled at times when it will have the least impact on production levels.

4.8.6.2.2. Production stoppages

Production may be stopped due to a fault in an item, a break-down in equipment, or a shortage of supplies.

This may be a particularly significant problem for continuous processes, although production stoppages may also affect batch processes.

The cost of a production stoppage is generally much greater than the actual time of production that is lost.

In some facilities and items of equipment, a considerable cost is involved in the process of actually starting or stopping production.

Also, this may delay other stages in the process, and disrupt the general flow of production within the facility.

The number and length of production stoppages may be determined by the operating condition of the equipment, and the production processes that are in place.

A process that is built on equipment and procedures that produce low fault rates may have a lower rate of production stoppages than alternative processes.

4.8.6.2.3. Maintenance & replacement

Industrial equipment generally includes a defined set of regular maintenance procedures, as specified by the manufacturer.

Also, repairs and non-scheduled maintenance may be needed on a regular basis with complex items of equipment.

Maintenance can be a significant expense in some manufacturing operations.

However, equipment that is not properly maintained may loose production capacity rapidly, and lead to a major decline in operating efficiency.

In addition to replacing consumable items and other scheduled maintenance, adjusting machines regularly may lead to reduced fault rates, prevent excessive wear and extend the useful working life of the equipment.

Equipment that has reached the end of its useful working life may experience frequent stoppages, high fault rates and require high levels of maintenance.

Equipment should generally be replaced when its operating performance begins to deteriorate significantly.

4.8.6.2.4. Product mixes

In most manufacturing operations, a range of different products are made.

Each product may have different margins, and may require a different set of raw materials.

The mix of different products that are made during a period may affect the net results for the period.

In many cases, the customer demand may determine the mix of production that is performed during a period.

However, other options could include producing a large batch of a product to be sold at a discount, and reducing or increasing the prices of individual products to lead to a more effective mix of production.

4.8.6.2.5. Availability

Although production levels have a significant impact on costs and net profit, the level of production is dependant on two issues.

The capacity utilisation is the number of items produced, as a percentage of the capacity of the facility.

In the short term, production levels may be determined by customer demand for the products.

However, production may also be affected by the availability of the facilities.

Availability refers to the percentage of time that a production facility was operational and available for use, whether or not production actually occurred.

A low availability rate may place a limit on production volumes, regardless of the level of customer demand.

If customer demand exceeded the available supply of products and significant delays were involved in shipping products to customers, then the availability rate may be a significant issue.

Down-time involves a period of time in which a facility is not available for use.

This may occur for some of the following reasons.

- Break-down in equipment that requires repairs.
- Scheduled maintenance.
- Stoppages due to a faulty item.
- Stoppages due to a lack of supplies.

In general the production management process should attempt to minimise periods of unavailability, particularly during periods of high sales demand.

The availability rate can be calculated using the following formula

$$\text{availability rate} = \frac{\text{hours available for production use}}{\text{total potential production house}} \times 100$$

For example, if the total hours of operation within a period were 1,000 hours and the facilities were available for use for 930 hours, then the availability rate could be calculated using the following example

$$\text{availability rate} = \frac{930}{1000} \times 100$$

$= 93\ \%$

4.8.6.2.6. Fault rates

Although the natural fault rate of a system is a product of the design of a system, fault rates are also an operational issue.

A stage in the production process that generates a high fault rate may lead to frequent stoppages of that stage and other stages, increase the level of manual input required, and reduce the quality level of the finished product.

Depending on the situation, high fault rates may be addressed by replacing worn-out items of equipment, changing the order and structure of tasks and processes, and addressing fault rates as a production issue along with volumes, availability rates and materials usage.

The fault rate can be calculated using the following formula

$$\text{fault rate} = \frac{\text{number of faulty items produced}}{\text{total number of items produced}}$$

In this calculation, the "number of faulty items produced" may include the following items.

- Items produced that are faulty or mis-formed.
- Machines jamming, causing a break in production.
- Items produced that are outside the design tolerances for the product.

For example, a production run may involve the following results

Volume produced	1,000
Faulty items produced	6
Items outside tolerances	23
Machine jams & stoppages	2
Total faults	31

$$\text{fault rate} = \frac{31}{1000}$$

$$= 3.1\%$$

4.8.6.2.7. Inventory management

Inventory includes raw materials held for production, and finished goods stored for shipment to customers or distributors.

Inventory management involves recording items held within inventory, managing inventory levels, and ordering supplies.

Large manufacturers may store thousands of different items within materials inventories, and small manufacturing operations may also have complex inventory arrangements.

Capital & inventory levels

Inventory must be funded, however stocks and finished goods that are stored do not earn a return.

For example, debt may be raised to fund inventory and on-going interest payments may be made, although no income would be received from the items held in storage.

The costs involved with inventory storage may also include lease or capital costs of storage facilities, insurance, and the deterioration of items held in storage.

For these reasons, the level of inventory is generally kept at the lowest practical level.

However, stopping production due to a lack of supplies may lead to significant production losses, and in general the inventory levels should be maintained at sufficient levels to prevent production stoppages wherever possible.

Records & ordering

Inventories are generally managed using computerised inventory management systems.

These systems may record the number of items that are held for each material, the rate of usage, and re-ordering arrangements.

Orders may be placed with suppliers on a regular basis, or as stocks become low.

Electronic links may be used in some cases to manage ordering arrangements for supplies.

In some cases, inventory and production management may be integrated into a single software system.

In other cases, separate systems may be used.

Production management software may store production records and generate reports regarding scheduling, production volumes, margins, usage of materials and so on.

Storage

A considerable amount of storage space may be required to store materials, and particularly finished goods.

Some manufacturing takes place within inner-city areas, where land area has a high cost.

In these cases, small amounts of frequently-used materials may be kept at the production site, with a large warehouse of supplies kept at another location.

Warehouse space can be leased on a temporary or permanent basis, or land can be purchased and warehouse facilities may be constructed.

4.8.6.2.8. Production employees

Manufacturing involves employing staff to operate machinery, load materials, and transport stocks.

This would generally involve a combination of permanent, contract and temporary employees.

Permanent staff are used when a detailed knowledge of the production process is required.

Contract and temporary staff are used to manage changing production levels due to seasonal demand and changes in sales levels.

Although employment arrangements with permanent staff can be terminated during sustained periods of slow sales, managing staffing levels is more practical when contract and temporary arrangements are used.

4.8.6.2.9. Excessive focus on efficiency

In some respects, the base line for production efficiency could be considered to be 100%, with figures less than this representing a reduction from the reference point.

For example, materials usage of 98% implies that 2% of materials were wasted, while a capacity utilisation of 85% implies that 15% of the potential production volume was not used.

However, in some cases attempts to increase efficiency and reduce wastage may be counter-productive.

For example, retaining old and worn-out equipment, and using supplies that have degraded in an attempt to avoid wastage and save costs may to lead to an increase in costs and wastage, rather than a reduction.

All manufacturing operations involve a proportion of wastage which must be written off in order to maintain efficient operating processes.

In general, any step that changes the fundamental nature of an operation and that improves efficiency may be a positive development.

However, a level of wastage is a natural part of efficient operations, and attempts to retain every last drop of value from supplies or equipment are likely to lead to a reduction in efficiency, rather than an increase.

4.8.6.3. Increasing volume capacity

Increased production capacity may be required when the business experiences strong sales demand, or when expansion into new markets occurs.

Increasing production capacity itself does not automatically lead to a higher level of sales.

However, increasing capacity may allow sale prices to be reduced to increase the number of sales, which may indirectly improve returns.

Also, many of the steps that may be involved with increasing capacity may also lead to a general improvement in the efficiency of the production process, and lead of lower costs, regardless of the volume that is actually processed.

4.8.6.3.1. Equipment & process design

The capacity of a production facility is dependant on the equipment that is used, and the processes that are established.

In some circumstances, changing the production processes may enable a higher rate of production to be generated.

For example, a machine may have a capacity of 10,000 units per hour, with storage space for 5,000 units of raw materials.

In this situation, the machine could only operate continuously for half an hour using a single set of supplies.

If a long manual process was involved in moving supplies and loading materials into the machine, then the total production level over a period of time may be far lower than the rated capacity of the machine.

Some machines can be re-stocked while they are operating, however the size of the storage and the time involved in loading supplies may be a major factor affecting the production rate and the costs of the process.

Examples such as this could be addressed using approaches such as increasing the storage capacity of the input and output storage, linking machines directly together, and changing the loading process so that supplies could more easily be transported and loaded into a machine.

4.8.6.3.2. Balanced process stages

If one stage in a production process is considerably slower than the other stages, the cost and capacity of the other stages may be wasted.

The speed of processing through the production stages is set by the slowest stage, with any excess capacity in other stages remaining unused.

High costs may occur due to the unused capital cost of the equipment and facilities in the other stages.

In general, regardless of the capacity of a particular facility, each stage should be balanced to have a similar capacity to the other stages, to reduce costs that may be associated with unused facilities.

This problem may particularly arise in situations where a large number of changes have been made to a facility over a period of time, rather than a facility being developed as a single project.

In these cases, a wide variety of different machines of varying capacity and age may be in place.

Production processes may have changed many times since the facility was first established.

In this situation, costs may be minimised if attempts are made to ensure that each stage supports a similar capacity to the other stages, and that a capital expenditure budget is directed towards updating the production stages that have the least capacity.

4.8.6.3.3. Bottlenecks

The capacity of a production process may be restricted by a bottleneck in the process.

In these cases, removing the bottleneck may lead to a large increase in capacity.

In a production process that involves many stages in sequence, the capacity of the process is set by the slowest stage in the process.

A bottleneck may severely reduce the throughput of a process that would otherwise have a much greater volume capacity.

Bottlenecks may occur due to some of the following reasons.

- A worn-out item of equipment with slow production and a high level of down-time.
- An item of equipment that is rated at a lower capacity than other stages in the process.
- A production stage than involves a high level of manual input, and that could either be replaced by machine processing, redesigned to be more efficient, or have a greater capacity through additional resources.
- Poor co-ordination and scheduling, where one stage finishes and a long delay occurs until a separate parallel stage is completed, so that the next stage of production can commence.

4.8.6.3.4. Expanding capacity

Expanding capacity may involve replacing equipment with higher-capacity machines.

This is a separate issue to replacing out-dated or worn-out machines, although in practice the two issues may be linked together in the purchase of a new item of equipment.

Capacity can be expanded by scrapping the existing equipment and purchasing a new machine, or by continuing with the existing machine and purchasing a smaller new machine to extend the total capacity.

Replacing a single machine with a single larger machine would generally lead to higher efficiency and lower costs than operating two machines in parallel.

Also, this approach may be necessary when the existing machine was past its useful working life and was not in a condition to enable efficient production to continue.

However, in cases where the existing machine was operating effectively and higher capacity was required, there may also be advantages in operating a new machine in parallel with the existing facilities.

This may require additional costs in maintenance and rent for floor space.

Also, the efficiency that would be achieved at full production levels may be lower than the efficiency that would be achieved by using a single large machine.

However, this approach may be more efficient at low production volumes, as in some cases a small machine that operates near full capacity may use fewer resources than a larger machine operating at a small proportion of design rating.

Also, this arrangement may allow for a back-up facility arrangement, where one machine could be used to allow production to continue if the other machine was unavailable due to maintenance or a break-down.

The capital cost of the new machine may also be lower that a replacement approach, when the existing machine provided a significant proportion of the total increased volume capacity.

4.8.6.4. Utilising production capacity

The effective operation of a manufacturing business may involve two related issues.

This may involve establishing an efficient production facility, and then using the facility effectively to produce products for customers.

Sales demand is of little relevance if the production facilities suffer from serious problems.

Also, an efficient production facility is of little use unless customer demand for the products occurs.

The success of a manufacturing business is dependant on fully utilising the capacity of the production facilities that are created.

4.8.6.4.1. Marketing

In cases where facilities are not fully utilised, marketing activities could be increased as a method of increasing sales.

This could involve advertising and promotion campaigns, marketing in new regions such as interstate and overseas, and arranging distribution with new distributors.

Unlike some activities such as retailing and distribution, the cost of a manufactured product is not a fixed value.

This cost changes with the level of production.

This can lead to a situation where sales are low because costs and prices are high, however the costs and prices are high because the sales level is low.

One option for addressing this problem may be to reduce sale prices in advance of a major promotion campaign.

Although early sales may generate a loss, the increased volume from a successful expansion may restore the margins to their previous level, at a high level of sales than the previous situation.

However, this approach may only be practical when the price has a direct and significant impact on the number of sales.

4.8.6.4.2. Products

Most manufacturers produce a range of products.

This may range from several major products, through to thousands of individual products.

Each product will have a different margin and may require different equipment and raw materials.

Discontinuing products that meet with little demand from customers may have several benefits.

This may allow the production capacity to be used to produce larger volumes of more popular products, which may also lower the costs of the more popular products.

Also, carrying a product has a wide range of costs, including issues such as complex product catalogues, inventory storage, equipment setup for production, computer processing of data and so on.

In the case of low-volume products, discontinuing a product may increase the efficiency of the production operation.

In cases where the product line has not been updated for a period of time, designing and launching new products may lead to an increase in sales.

Also, existing product designs may need to be updated to meet changing interests from customers.

In the case of spare parts for discontinued products, these may be manufactured while a steady level of sales demand continues.

When sales fall to a low level, one option may be to organise a large production run for the part.

The parts could then be placed in storage, together with any tools, moulds and specifications, and removed from the general manufacturing inventory and operation lists.

This process may allow a storage of parts to be kept for several years to meet parts requests, and possibly for decades, without the costs involved in maintaining a large number of unused products within the operational product lists.

4.8.6.4.3. Seasonal businesses

Seasonal industries have the majority of their sales are certain times of the year.

This may be weather-dependant, such as winter skiing equipment, or calendar-dependent, such as retail sales during December.

In these cases, production may continue through the year, with finished goods being stored for delivery.

This approach has the advantage that a steady rate of production can be maintained through the year, which may allow more efficient production.

However, in cases where temporary facilities can be hired, lower costs may be achieved by organising a large volume of production over a period of a few months, rather than maintaining facilities through the full year.

Storage of finished goods may present a problem when a large volume of storage space is required, or when the goods are perishable, such as food items.

In these cases, continuing production through the full year may not be practical.

Alternatives may include arranging production for several months, and using production capacity during the other months to produce a different range of products, or to perform contract manufacturing for other businesses.

4.8.6.4.4. Cyclical businesses

Cyclical industries have large variations in activity from one period to the next.

For example, the construction industry may have several years of high activity, followed by several years of very little activity.

Operating in a cyclical industry may present a difficulty for the management of an effective manufacturing operation.

This could be addressed in a number of possible ways.

This may include some of the following points.

- Constructing split facilities, so that parts of a facility could be closed during periods of slow sales.
- Using hired and temporary equipment during periods of high sales demand.
- Launching a second product range that was sold in a different industry, and was not affected by the same cycle as the main industry.
- Performing contract manufacturing for other businesses.

4.8.6.4.5. Split facilities

Split facilities involves the use of several smaller machines rather than a single large machine.

Also, this may involve duplicating a process in several sections within a facility, so that each section could be operated as a complete production facility, or all sections could be operated to generate the maximum production output during periods of high demand.

This process may allow small volumes to be produced at lower costs that the costs involved with operating a large facility at low volumes.

Part of the facility may be operated at close to full capacity, and the alternative facilities could be placed on a general maintenance basis during times of low sales demand.

4.8.6.4.6. Contract manufacturing

Contract manufacturing involves producing goods for other businesses.

This could include short-term arrangements to meet seasonal demand or to supply capacity to businesses experiencing production problems.

Alternatively, longer-term arrangements may apply to businesses that do not operate their own production facilities, or to businesses that are expanding and have insufficient in-house capacity to meet sales demand.

This arrangement may allow the business to smooth cash flows across periods, continue production levels when sales are low, and generate income without the costs associated with product development, marketing and distribution.

4.8.6.5. Capital expenditure decisions

A decision to purchase a new item of equipment or to construct a new facility may be a major business decision.

The cost of industrial equipment may be high in comparison to the cash flow and cash resources of the business.

Capital expenditure decisions may involve replacing an individual machine, or constructing an entirely new facility.

Machine replacement may occur every ten or fifteen years, while large scale manufacturing facilities generally operate largely unchanged for several decades before they are re-built.

The decision to replace an item of equipment may involve a review of the current equipment in use.

This may involve recording some of the following information

- The fault rate over a period of time.
- The percentage of down-time.
- The maintenance costs.
- The volume capacity of the machine.
- The production volume that can be achieved, allowing for the time involved in setting up and supplying the machine.
- The current depreciation expense, if any.
- The interest payable on debt that was equal in size to the market value of the machine. This would be the interest saving that could be achieved by selling the machine.

Similar figures could be estimated for a new machine.

A comparison could then be done between the depreciation and interest expenses associated with the new machine, and the cost savings due to lower maintenance, less down-time, and higher production volumes compared to the existing machine.

However, the effect of each stage on the total production process should also be considered.

In general, maintaining an efficient flow through of every stage in the production process may have benefits for the business beyond the direct measured cost of an individual item of equipment.

Net present value

In the case of larger scale facilities, a net-present-value project valuation may be conducted.

This may involve estimating the income over the expected life of the facility, assuming a certain rate of growth in sales, inflation, volumes and so on, and comparing the present value of the income with the capital cost of the project.

For example, the following figures may be used as assumptions to value a project.

Initial sales value	10,000
Sales growth rate	5 % p.a.
Profit Margin	10 % (constant over time)
Project discount rate	15 %
Estimated facility life	20 years

Year	Sales Value	Net Profit	Present Value
1	10,000	1,000	870
2	10,500	1,050	794
3	11,025	1,103	725
4	11,576	1,158	662
5	12,155	1,216	604
6	12,763	1,276	552
7	13,401	1,340	504
8	14,071	1,407	460
9	14,775	1,477	420
10	15,513	1,551	383
11	16,289	1,629	350
12	17,103	1,710	320
13	17,959	1,796	292
14	18,856	1,886	266
15	19,799	1,980	243
16	20,789	2,079	222
17	21,829	2,183	203
18	22,920	2,292	185
19	24,066	2,407	169
20	25,270	2,527	154
Total Net Present Value			8,379

The present value of a figure represents the equivalent value of a future cash flow on the current date.

Present values are discussed in detail in the section on finance, beginning on page 734.

In this example, the total present value of future year's profits over the life of the project would be equivalent to 8,379 at the current date.

In this case, if the project could be constructed at a lower cost than this figure, then the project would have a positive net return, otherwise constructing the facility would be a loss-making transaction.

This approach is generally used to value large project developments.

Other issues may also be involved, such as the costs and returns of existing facilities, the plans for future directions and products of the business, and so on.

Valuation multiples

A project valuation could also be calculated using a multiple, such as a multiple of the current net profit.

This approach may be particularly relevant to a facility that was already operating.

For example, projects of a similar type may be valued at around 8.5 times the current year profit.

In this case, the project value could be estimated using the following example.

$$\begin{aligned} \text{project value} &= \text{valuation multiple} \times \text{current year profit} \\ &= 8.5 \times 1000 \\ &= 8500 \end{aligned}$$

4.8.6.6. Expansion & improving returns

4.8.6.6.1. Commodity producers

Commodity products are items that are sold in large volumes of similar items.

This includes agricultural products and mining products.

Industrial commodities include chemicals, paper, steel, and hardware components for computers.

Electricity generation and oil refining could both be considered to be commodity production activities.

Commodities are produced in large volumes, and generally trade in open markets.

Prices in these circumstances fall to the lowest sustainable level, based on current production technology.

Economies of scale may be the major factor in the effective operation of a commodity manufacturing operation.

In general, the latest production technology must be used, and capital equipment in these manufacturing facilities may be updated on a regular basis.

Paper mills, steel mills and hardware manufacturers generally operate with very high production capacities, continuous production processes, and efficient production.

In the case of commodity producers, a small range of standard products is generally produced in high volumes.

Prices of both input and output items are generally set by external forces.

In these situations, improving returns may be based on increasing volumes, or reducing costs through capital investment in the latest technology and large-scale production equipment.

4.8.6.6.2. Specialist producers

Specialist producers produce a wide range of various products.

In these cases, products may vary widely from one manufacturer to another.

Product design, development and marketing may be important issues in these operations.

The efficiency of production and the sale price of the finished goods may be less critical in these cases than in the case of commodity producers.

However, increasing production efficiency may improve returns, as in many cases the volume of sales that can be generated may be limited by the wide variety of other products that are also available in the market place.

4.8.6.6.3. Large market shares

Due to the capital-intensive nature of manufacturing and the economies of scale that can be generated, it is common for an industry to consolidate into two or three major producers.

In these cases, expansion within the industry may be difficult.

Although lowering prices to increase sales may be effective in markets with many competitors, in the case of concentrated markets, a direct response from the competitors may occur, with price reductions being directly matched.

In this case, returns would be reduced and sales may not increase.

Investment in new capital equipment, implementing new technology, and updating processes may improve returns.

However, in the case of concentrated industries, the main opportunity for expansion may involve entering new markets.

This may involve selling existing products in new areas, such as overseas markets, or launching a new product range within a new industry.

4.8.6.7. Example production reports

The following formats present some of the information that could be included in production reports.

Production reports may often contain large volumes of information.

The formats below a not intended as specific formats, but illustrate the type of information and calculations that could be useful in managing production.

(** calculate percentages etc. in displayed figures)

	Units Produced	Variable Cost	Sale Price	Production Margin	Fixed Cost Allocation	Sale Margin	Capacity	Capcity Used
Product A	1344	2.32	2.84	12%	2.34	8%x	1222	73%
Product B	2134	4.34	2.43	8%	2.34	6.5%	2333	12%
Product C	32342	1.34	5.23	15%	2.34	12%	1212	85%

	March	April	May	June	Quarter	Same quarter in Previous Year	Year	Change since last year
Product A	1344	2342	2342	2342	54334	34345	1222	+ 12%
Product B	2134	4342	234	8%	2.34	6.5%	2333	- 14%
Product C	32342	2343	5435	15%	2.34	12%	1212	+ 43%

	March	April	May	Year	Last Year
Total Plant Hours	1234	1234	1234	123443	123443
Downtime					
Scheduled Maintenance	43	35	345	453	345
Other Schedule Processes	345	45	34	54	345
Unscheduled Stoppages	345	35	345	54	326
Stoppages due to supply shortages	234	342	65	76	345
Total Down Time	2344	324	543	645	345
Available Hours	434	234	3424	234	234
Availability	98%	82%	93%	63%	94%
Production Hours	341	2341	341	2134	341
Available Hours Used	23%	32%	23%	32%	23%

	March	April	May	Year	Last Year
Income	234	3245	543	345	34
Expense for fixed costs	345	5345	34	35	23
Expenses for variable costs	76	345	3434	34	23
Available Billable Hours	1234	1234	1234	123443	123443
Hours Billed	2344	2342	2344	2342	4234
Proportion of hours billed	23%	23%	75%	45%	23%
Fixed cost per hour billed	3.43	4.34	3.33	4.43	23.43
Fixed costs at max. hours billed	2.43	2.43	2.54	5.434	3.43

Plant Utilisation for September

Production Capacity	123444
Production	23213
Fixed Costs	23232
Fixed Costs/Unit	1.32
Fixed Cost/Unit at max capacity	1.12
Margin	7%
Margin at max capacity	9.5%

4.8.7. Creating a manufacturing business

Markets for manufactured products can generally be described as either commodity markets or specialty markets.

Commodity markets involve large volumes of a small number of products, and include examples such as paper, steel and consumer electrical goods.

These markets are generally supplied by a small number of manufacturers operating plants with high production volumes and large economies of scale.

Specialty markets include a wide range of goods that are sold in smaller volumes, with many different product designs being used.

Competing effectively in a commodity market would require raising a large sum of capital and constructing a high-capacity facility.

Operating a specialty manufacturing operation can be implemented as a small start-up operation, beginning with limited volumes and expanding as sales are increased.

Manufacturing operations have an advantage over some other forms of business activity, in that samples can be made and presented to potential customers before the operation commences.

In contrast, the market demand for some activities, such as service businesses, cannot be effectively determined until after the business begins operating.

A start-up manufacturing operation may commence with samples, mock-ups or models, produced using manual methods, and used to demonstrate the product ideas to potential customers.

Production may commence within hand-made activities in some cases, while in other cases some low-volume equipment could be leased or purchased to commence operations.

The design, costs and pricing of the products may be important in these circumstances.

Examples of possible products may include some of the following items.

- Unusually design products.

- Tools and equipment for new industries, when the equipment has been adapted from other uses and is not directly suitable for the purpose that it is being used for.

- New products where the existing manufacturers supplying products have withdrawn from production, moved into different industries, or not updated their product designs for long periods of time.

- Products designed for specific purposes, in cases where general-purpose products are currently used.

- Products designed for small target markets, where large manufactures do not currently supply specific products.

The general pattern of development of a manufacturing business may involve commencing with a small scale operation, producing a limited number of products and sourcing sales within a limited area.

If products were well received and met with steady sales demand, then facilities could be expanded in stages, through the purchase or leasing of higher-capacity equipment, and through using machinery for processes that were previously performed manually.

This process may be associated with reduced costs and sale prices, expansion into wider areas, and possibly expansion of the number of products into a wider product range.

In the case of expanding facilities and lower costs per unit, sales volumes may also increase within existing markets due to the lower prices that may be offered.

This expansion process would generally require significant capital, which could be funded through bank loans, through funds sourced from the existing business owners or other investors, or through leasing arrangements.

4.8.8. The evolutionary process within manufacturing

Improvements in technology may allow products to be manufactured using fewer raw materials than previous processes.

As time goes by, new technology may be implemented and may result in larger and more efficient facilities.

The size of production facilities, the production capacity, and the capital costs may all increase.

Conversely, the amount of manual input, the time required to produce an item and the raw materials used for each item may decrease as this development unfolds.

The evolution of manufacturing processes allows products to be created in higher volumes, at lower costs per unit than previous processes.

This trend may occur within the economy generally, within specific industries, and within individual businesses that expand in size or that increase production efficiency.

4.8.9. Miscellaneous manufacturing issues

4.8.9.1. Spare parts

Spare parts may be a significant issue in several situations within manufacturing.

Internal equipment

Supplies of spare parts for equipment that is used by the business may be necessary to enable regular maintenance to be performed, and to repair equipment following break-downs.

In most cases, spare parts would be sourced from the equipment manufacturer, or from third-party manufacturers, as they were required.

In the case of equipment that was discontinued by the manufacturer, or when the manufacturing business ceased to operate, keeping internal stores of spare parts may be useful in avoiding long-term problems with obtaining parts.

Also, this approach may allow maintenance and repairs to be conducted at less cost and in shorter periods of time than if parts need to be sourced externally.

Products

Parts for manufactured equipment are generally supplied directly to distributors, in addition to the completed products, for use in service and repairs.

Producing spare parts, in addition to producing completed products, may be a significant part of a manufacturing operation.

Spare parts inventories may contain thousands of different types of items, and involve complex storage, ordering and inventory control arrangements.

Availability

In the case of large items of equipment with long expected operating lifetimes, the future availability of spare parts may be a significant issue in a customer's decision to purchase a product.

Although this may not become a major issue in the case of stable manufacturing operations with long histories, in other cases this issue may become significant.

For example, in a situation where there was significant doubt about the continued operation of the business, customers may decline to purchase products due to the risk that parts may not be available in the future.

Many items of equipment have expected lifetimes that may exceed 15 years, and in some cases these products would be unable to operate if a small part was not available for replacement.

As another issue, this situation may result in the establishment of a steady stream of sales being difficult for a new or a small manufacturer of capital equipment, where customers may avoid the products due to the risk of long-term parts availability.

This issue may be addressed in various ways.

One option may be to establish an escrow parts inventory, with spare parts being produced and stored in warehouse facilities, and owned and managed by another party such as a commercial trustee.

In the event of a business liquidation, the parts inventory may be maintained separately and taken over by another operator, to enable a long-term parts supply to be maintained.

In some cases, a single item of equipment may be designed and constructed.

For example, a manufacturer may commission the design and construction of a specific machine to perform a certain operation in the manufacturing process.

In these cases, a set of spare parts may also be created along with the completed machine, to allow for regular maintenance and future replacement.

The engineering designs may also be supplied with the machine, to enable parts to be created in the future as required.

Parts designs

In cases where manufactures cease to operate or are liquidated, it is common for other parties to take over the product designs of the manufacturer, and to continue the maintenance and spare parts supply of the previous products.

This may be done by another party purchasing the designs and the rights to the product directly from the business itself, or through the liquidation process as part of the sale of the business's assets.

A nominal fee would normally be involved, as in many cases the liquidation itself may have been related to a low volume of sales, and the new operator may simply perform maintenance and supply activities for the products that were already in use.

4.8.10. Summary of manufacturing issues

Capital assets	Manufacturing is a capital-intensive, asset-based activity. Equipment and facilities are used to produce goods for sale. The return on assets figure, which gives the percentage profit return on the asset base, represents the percentage return from the manufacturing operation itself, ignoring interest costs and debt leverage.
Depreciation	Equipment declines in value over time. This depreciation expense represents a loss of value. The net profit during a period is the net cash flow, minus the loss of value due to depreciation.
Design & Manufacturing	Product design is a project-based activity, while manufacturing is a continuous activity. In cases where product design is a large business expense, the financial analysis may split the design costs from the manufacturing operation, with licence fees allocated for the manufacturer's use of product designs.
Economies of scale	In general, the cost per unit of production is lower for high capacity equipment and facilities than for low capacity equipment and facilities. This effect also occurs with production levels within an existing facility.
Fixed & variable costs	Manufacturing costs may include fixed costs per period, such as lease payments and depreciation, and variable costs, such as the raw materials used in production. A high proportion of fixed costs may be associated with high capacity facilities and high levels of automation. A high proportion of fixed costs may result in a high leverage of net profit to rises or falls in sales levels.
Technology	Technology is a major issue in manufacturing. This includes new advances in equipment design, new techniques, and updated processes. Technology and economies of scale may be the two major factors in determining the potential efficiency of a manufacturing operation.
Volumes	The volume of goods produced is relevant to the results and performance of a manufacturing operation, in addition to financial figures. In particular, the capacity utilisation, which measures the production volume as a percentage of the

facility’s potential production level, may have a significant impact on the net profit results.

4.8.11. Summary of manufacturing calculations

4.8.11.1.1. Production

$$\text{availabili ty rate} = \frac{\text{hours availabile for use}}{\text{tota hours of potential production}} \times 100$$

$$\text{capacity utilisatio n} = \frac{\text{number of units produced}}{\text{design volume capacity}} \times 100$$

$$\text{materials usage per item} = \frac{\text{volume of material used}}{\text{number of items produced}}$$

$$\text{materials usage efficiency} = \frac{\text{volume of material in finished products}}{\text{volume of material used}} \times 100$$

$$\text{production capacity} = \text{machine capacity} \times \frac{\text{average run time}}{\text{average run time} + \text{average down time}}$$

$$\text{fault rate} = \frac{\text{number of faulty items produced}}{\text{total number of items produced}}$$

Process time for a series process = sum of the times for each stage

Process time for a parallel process = maximum time for a single stage

4.8.11.1.2. Plant structure

$$\text{automation level} = \frac{\text{depreciation}}{\text{depreciation + labour costs}} \times 100$$

$$\text{average equipment age} = \frac{\text{sum of the age of each item}}{\text{number of items}}$$

$$\text{non-depreciating equipment} = \frac{\text{number of non-depreciating machines}}{\text{total number of machines}} \times 100$$

$$\text{non-depreciating equipment} = \frac{\text{variable costs used by non-depreciating equipment}}{\text{total variable costs}} \times 100$$

$$\text{ocupancy capital intensity} = \frac{\text{equipment \& facilities assets}}{\text{building occupancy costs}}$$

$$\text{occupancy utilisation} = \frac{\text{net profit}}{\text{building occupancy costs}}$$

4.8.11.1.3. Fixed & variable costs

$$\text{break-even sales volume} = \frac{\text{fixed costs}}{\text{sale price per unit} - \text{variable cost per unit}}$$

$$\text{fixed cost per unit} = \frac{\text{fixed costs}}{\text{num units}}$$

$$\text{fixed cost per unit} = \frac{\text{fixed cost}}{\text{design volume} \times \text{capacity utilisation}}$$

$$\text{cost per unit} = \text{variable cost per unit} + \frac{\text{fixed costs}}{\text{num units}}$$

$$\text{cost per unit} = \text{variable cost per unit} + \frac{\text{fixed cost}}{\text{design volume} \times \text{capacity utilisation}}$$

$$\text{production leverage} = \frac{\text{num units} \times (\text{unit sale price} - \text{unit variable cost})}{\text{num units} \times (\text{unit sale price} - \text{unit variable cost}) - \text{fixed costs}}$$

4.8.11.1.4. Margins

$$\text{production margin} = \frac{(\text{sale price per unit} - \text{variable cost per unit})}{\text{sale price per unit}}$$

$$\text{sales margin} = \frac{\text{num units} \times (\text{sale price per unit} - \text{variable cost per unit}) - \text{fixed costs}}{\text{num units} \times \text{sale price per unit}}$$

4.8.11.1.5. Returns

$$\text{return on assets} = \frac{\text{earnings before interest \& tax}}{\text{assets}}$$

$$\text{ROA} = \text{sales capacity} \times \text{production margin} \times \text{capacity utilisation} - \text{fixed cost ratio}$$

Terms for the return on assets formula

$$\text{sales capacity} = \text{sales price} \times \frac{\text{design volume}}{\text{assets}}$$

$$\text{fixed cost ratio} = \frac{\text{fixed costs}}{\text{assets}}$$

$$\text{capacity utilisation} = \frac{\text{number of units produced}}{\text{design volume capacity}}$$

4.8.11.1.6. Profit

$$\text{net profit} = \text{num sales} \times (\text{sale price per unit} - \text{variable cost per unit}) - \text{fixed costs}$$

$$\text{net profit} = \text{production margin} \times \text{sales value} - \text{fixed costs}$$

$$\text{net profit} = (\text{sale price per unit} - \text{variable cost per unit}) \times \text{capacity utilisation} \times \text{design capacity} - \text{fixed costs}$$

4.8.11.1.7. Funding structure

$$\text{ROE} = \text{ROA} + \frac{g}{1-g}(\text{ROA} - \text{debt interest rate})$$

g = gearing ratio
ROA = return on assets
ROE = pre-tax return on equity

4.8.11.1.8. Weighted Averages

$$\text{weighted average} = \frac{\text{sum of the "amount} \times \text{weight" for each item}}{\text{sum of the weights}}$$

4.9. Strategic planning & review activities

A strategic planning and review process may involve a periodic set of discussions among a team or a group of people.

This may occur at various times, although reviews once every year or two may be a time frame that may be suitable for long term discussions in some circumstances.

A strategic review may be used to clarify and work through a large number of current problems, and also to determine a medium term direction for the operation and the development of the activity.

4.9.1. Occasions

Strategic reviews may occur at various times, which may include some of the following points.

- Scheduled reviews, such as an annual review and planning process.
- Following a major milestone, such as the completion of a large project, or a start-up enterprise reaching a stable positive cash flow position.
- During times when major issues may arise, that may affect the operation and direction of the activity, and which may involve detailed discussions and major decisions.
- When a large number of issues arise and future directions seem unclear.

In the case of reaching a major milestone, a period of time may elapse following the completion date or the occurrence of the event.

Following a period of time after the completion period, thoughts may be gathered and the process of discussing future directions may begin.

4.9.2. Location & structure

4.9.2.1. Location

A strategic review process may be assisted by holding the discussions within a different location to the usual business operations.

This may involve a separate building, a conference centre, or other venues such as a hotel function rooms.

In the case of reviews covering several days, a residential location may also be used.

This may involve a conference location that includes accommodation and meals, where the discussions may be moved to a completely separate location for a number of days.

4.9.2.2. Group size

Strategic reviews may operate effectively when they involve a group of between approximately six and twelve people.

A group of three or four may find that discussions may be little different than the discussions that may occur directly within a business environment, although the process of formalising the discussions may still be useful.

In the case of groups that are larger than about 15 people, group discussion may not be practical, and the event may become similar to a question and answer lecture format, which may not be productive to the development process.

4.9.2.3. Group individuals

A review may involve a single team that may operate a particular activity within the business structure.

In other cases, a group may involve representatives from several different sections within the business, such as the heads of various departments.

Strategic planning processes may also be held by boards of directors, and by business owners and individuals from the business in the case of other business structures.

In some cases, a team may be assembled involving various individuals, as part of a major transaction, such as preparing a bid for a large tender.

4.9.2.4. Time frames

A strategic review may operate for two or three days.

A minimum of a full day may be required, and longer time periods may be necessary to fully work through long term issues.

Reviews lasting more than a week may degenerate into discussions that may revolve in circles, covering the same issues repeatedly, with the group members becoming very tired, and with little additional progress being made following a full week of discussions.

4.9.3. Topics

Discussions may involve a wide range of topics.

This may include some of the following items

- A summary and review of progress that has been made, developments which have occurred, and major events from the previous year or two.
- Possible future directions, including opportunities, problems, and issues related to each possible direction.
- A review of the current business situation, such as resources, current activities, and a review of the current structure and operations.
- A discussion of current problems, options and alternatives for addressing current problems, and steps and actions that may be taken.

4.9.4. Preparation

A broad agenda and list of topics may be prepared before the review is conducted.

Each individual team member may then prepare notes and collect their thoughts on the various issues that may be involved regarding each topic for discussion.

Notes and materials such as overhead slides may be prepared for presenting information to the group, such as a summary review of major activities and events, and lists of options for future directions.

4.9.5. Organisation & operation

4.9.5.1. Co-ordination

A strategic review activity may proceed smoothly in many cases where a specific individual is nominated to coordinate activity and discussions.

This may involve an individual such as a team leader or a chief executive officer.

In the case of several individuals from different areas, problems may sometimes arise in organising discussions.

Attempts may be made to organise activities on a co-operative basis, however in many cases this situation may not operate effectively.

In some situations a struggle may develop to control the discussion process, while in other situations the opposite case may occur, with no coordination occurring, and topics not being effectively raised or issues being addressed as intended within an agenda or the context of the planning process.

In this situation, a single individual may be nominated at random to coordinate the discussion process.

In some cases, professional facilitators, or individuals experienced in the development process, may be used to coordinate discussions.

This may be relevant in cases such as large groups, case where hostility may exist between internal areas of the business, and so on.

4.9.5.2. Structure

In general, a rough agenda of topics may be followed.

Each topic may begin with a presentation to the group by an individual, summarising key points and issues that may be involved in the topic.

Following this, general discussion may occur.

In some cases, a topic may begin with general discussion, rather than an individual presentation.

Several hours of discussion may be necessary in order to raise the relevant issues and work through the issues through the discussion process.

Summarising issues and options on a chart or display board may be useful during the discussion process.

The discussion process itself may be extremely useful in developing ideas and options, and working through existing problems.

In some cases, a specific set of actions may also be decided on as a result of the discussion process.

In general, each member of the group should have the opportunity to conduct a presentation, and present their throughs on a wide range of issues, and possibly also present information relating to a specific topic.

4.9.6. Outcomes

A major outcome of the strategic review process may involve a clearer picture of current problems, the structure and operation of the business, and the direction for development over the medium term.

Specifically, outcomes of the review process may include some of the following items.

- A list of actions to be taken to address current problems.

- A clear picture of the direction for activity over the medium term, such as the new few years.

- A possible list of new projects, changes to resources and activities, and other issues relating to the business activities to be conducted over a medium term time frame.

4.9.7. Larger groups

A related review process may also be conducted by larger groups.

This may involve groups of up to around 100 people.

This may represent an entire organisation, or an individual department, division or business unit of a larger organisation.

In the case of groups that may be larger than this, the situation may develop into a lecture type of format, which may not have a great deal of benefit as a review process.

In the case of a large group, the review process may mainly involve presentations by individual teams, rather than discussions.

A similar location to team reviews may be chosen, with a full day being a possible time frame for the review process.

Each team may conduct a presentation, outlining major activities and events of the previous year, current activities, and plans and projects for the medium term.

Throughs on general issues regarding the business may also be presented.

Individual problems may be raised, although a forum of this kind may not be a productive situation to address problems, as a full discussion of the issues may not be practical.

Problems may be best addressed within team discussions, and in separate discussions between individual areas.

A separate review by the chief executive officer or head of the business unit may also address the operations and activities of the entire area, as a single operation.

4.10. Growth & decay

A business may grow through the actions that are taken by the operators of the business.

A business is a dynamic activity.

In the absence of continuous attention and ongoing management, a business enters a natural state of decay, and may gradually decline in size and operation until it ceases to operate and closes.

The efforts and ideas of the person or people managing and operating the business are the driving force that sustains the business and creates the expansion of the business enterprise.

4.10.1. Capital investment

Long-term survival and expansion of the business requires regular investment in new projects.

This may involve purchasing new equipment or building new facilities, developing new products, developing computer systems, and designing new processes.

Capital investment projects can be funded from cash flow from the ongoing business operations, or capital may be sourced from raising debt or from additional equity investment from investors.

4.10.2. Organic expansion

Organics expansion involves the growth of the business from internal means.

This may involve expansion into new markets, growth in sales and customer numbers, and developing new products and services.

Organic expansion can be driven by the changes that occur in the business operations as time goes by, leading to improved use of technology, changes to processes and operations, and the development of economies of scale as customer numbers increase.

Organic growth can also be derived from specific projects, such as product development and establishing operations in new geographic regions.

4.10.3. Acquisition

Growth by acquisition involves buying other businesses.

This approach can be used to enter new markets, to acquire technology that would be useful within the exiting business, to reduce per-unit costs through larger volumes, and to make large leaps in size that would require a long period of time or would simply be impractical through gradually increasing customer numbers.

Growth by acquisition may involve paying an additional cost in the purchase of an existing business.

While in some case the acquisition of another business may simply involve transferring customer accounts to the existing business, in general this process may involve an extended period of time and a dis-organised structure until a new structure is developed for the expanded business.

4.10.4. Decay

Decay is the natural state of all non-living things.

Anything that is constructed or built begins to decay from the moment that it is created

Over time, a physical object or other structure gradually breaks apart, until it becomes the basic raw materials that occur in nature, and that it was built from.

This occurs in the rusting and decay of machinery, the decay of trees and other plant life, and in the decay of buildings and other structure.

This concept also applies to other constructed items, such as businesses.

Without continual renewal, a business gradually decays.

In a static business operation, customer tastes and interests may change, but the products provided by the business may not be updated.

New competitors may appear with different approaches, and customers may move to other suppliers.

Internal structures may also slowly fall apart, and different systems and processes may gradually cease to operate.

This is a natural state of affairs and can occur when a business owner looses interest in the business operations, at times following retirement, and when a business is owned by passive investors and effective management is not in place.

4.10.5. Capital starvation

Capital starvation occurs when capital is not available to conduct new projects and investment, and when costs are reduced to an unsustainable level that results funds being unavailable to purchase essential supplies, such as information supplies.

This situation may occur in cases where repeated budget reductions have been applied to a business operation for an extended period of time.

Also, this may occur when funds are inappropriately allocated.

For example, rather than using the available funds to develop a small effective operation, the available funds may be used to create or sustain a larger operation, which cannot operate effectively using the available resources.

Capital starvation can result in an organisation becoming paralysed.

Large sales may be lost due to small items not being available for the development of marketing approaches and other activities.

Minor changes to products may not be possible, which may result in serious operational problems.

An organisation operating under conditions of capital starvation may continue to operate with the current structures and operations from previous periods.

However, this may lead to a structure than gradually becomes outdated as time progresses, leading to collapse or large losses at some future time.

Alternatives in this situation are to raise additional capital through debt or equity, increase operational budgets, reduce the dividend stream withdrawn from the business, or to restructure the business to create a smaller operation that is able to move forward effectively.

5. Topics

5.1. Sourcing business services

5.1.1. Contract Services & project developments

Contract services and project developments involves transactions with other businesses regarding on-going services, as opposed to buying and selling products.

This may occur in a wide range of circumstances.

For example, contract services may be used for some of the following types of services.

- Administration.
- Computer hardware & software supply, maintenance and user support.
- Equipment maintenance.
- Business services such as property management.

In this context, contract services refers to an on-going service activity, rather than individual transactions involving services such as legal services, accounting services, advertising activities and so on.

Project contract development may involve the development of projects using external contract arrangements.

For example, this may involve some of the following activities.

- Building construction.
- Computer software development.
- Engineering design & testing of product designs.

A project development generally involves a specific task, with specified time frames and costs.

In most cases an item is produced by the project, although projects are also conducted for activities such as testing designs, conducting large advertising campaigns and so on.

5.1.2. Internal vs. external services

Service and project developments are arranged and managed on a contract basis.

In the case of internal service areas, a service agreement may be termed a Service Level Agreement, while in the case of an external business, a service contract may be in place.

A number of issues may be relevant in making a decision as to whether to use an external service provider, or to use or establish an internal service area.

These may include some of the following issues.

5.1.2.1. Economies of scale

External service providers may often perform services for a range of clients, and may conduct a larger number of transactions than the business would conduct directly.

This may allow the external business to operate at lower costs than an internal service area, due to economies of scale.

For example, the cost of computer software purchase or development could be spread across a large number of transactions, while equipment such as high-capacity printers and mail sorting machines could be used.

The economies of scale may allow the external service to supply the services at a lower cost than using an internal service operation.

5.1.2.2. Variable volume levels

The major benefit with the use of external services may involve the ability to increase or decrease the volume of transactions that are processed and the costs that are incurred.

An internal service area may generally have a fixed cost and capacity, which could not be easily changed in the short term.

During times of slow sales, the fixed costs may remain even though the capacity is unused.

During times of strong business activity, the internal area may not have sufficient capacity to meet the needs of the business activity.

In contrast, external service providers may charge on the basis of the number of transactions processed, with few practical limits on the minimum or maximum volume.

This arrangement may significantly increase the flexibility of the business, reduce the chance of losses during slow periods, and allow the business to operate effectively when sales demand is high.

5.1.2.3. Termination and commencement

Service contracts may often be terminated or commenced at relatively short notice.

In contrast, creating or closing an internal service area may involve a considerable period of time and a major change to the business structure.

The flexibility of external services may allow the business to adapt to changing conditions and pursue various paths, such as discontinuing products, launching new product ranges, and so on.

5.1.2.4. Process knowledge

External services may not be practical in cases where a detailed knowledge of the business structure and processes is required.

For example, the preparation of accounts and financial statements would usually be performed in-house.

In the case of large service agreements, this problem may sometimes be partially overcome by individual staff members within the service provider being involved solely with transactions related to a single client.

5.1.2.5. Availability

In some cases, external service providers are not available to perform various services, or the services that are available may not meet the service standards and cost structures that would be desirable in operating the business.

In these cases, an internal service area must generally be used, involving either an existing service area, or creating a new service area.

5.1.2.6. Project resources

Although the total amount of work involved in a project is not affected by the number of employees performing the project tasks, this issue may affect the time that is taken to complete the project.

Long projects may lead to high interest costs, lost opportunities in the market place, difficulties with temporary arrangements, and the chance of problems developing due to circumstances changing during the development of the project.

The use of external services may have a benefit in terms of the possibility of allocating a large number of resources to a project for a short period of time, rather than requiring a long project development.

This approach may also be used with internal development areas in some cases.

A project completed on this basis may be completed in a relatively short period of time, particularly regarding the construction phases rather than the design phases.

Disadvantages with this approach may include the limited time available to correct design problems and change the course of the project.

A risk may arise in these cases of a design problem becoming frozen into the structure of the completed project.

Also, the structure of the completed project may be partially formed as the construction appears, without the opportunity for review by the client.

However, these issues may be outweighed by the wide range of potential benefits that may be available from a short project development time.

5.1.3. Components of a service agreement

In some cases, service contracts and agreements may contain a large number of individual points.

This would generally occur in the case of a large transaction, where a contract was individually negotiated between the service provider and the client.

In the case of retail services that involved a large number of clients, such as telephone services, a set of standard products and service levels would generally be available, with a relatively straight-forward fee structure.

Some of the specific points that could be addressed may include the following issues.

5.1.3.1. Fees

The fee arrangements would normally be specified, and could include some of the following fee structures.

- Fixed regular fees.
- Fixed transaction fees, with the fee level related to the type of activity involved in a particular transaction.
- Usage fees, with the fee based on the amount of usage of items such as computer data, electricity, transport services and so on.
- Minimum and maximum fees, and combinations of various fee arrangements.
- Project payments such as regular payments, payments when stages were completed or milestones were reached, payments at the end of the period and so forth.

5.1.3.2. Time frames

A service contract may specify time frames, such as response times to enquiries, turn-around times for processing specific transactions and so on.

In the case of projects, a project schedule may apply.

In many cases this would be a period of time with a target project completion date.

In the case of large project developments, timeframes may be specified for the completion of various stages.

5.1.3.3. Progress reviews

Progress reviews of projects may involve the client reviewing the structure of the product and the progress of the project at various points in the development.

This may be done to ensure that the project was proceeding according to the schedule, and also to ensure that the design of the item matched the design that the client was expecting.

A progress review may involve the business as the client of a development project, or alternatively, the business may be involved in a project review as the project developer.

In the case of a project development business, this process may reduce the risk to the business of disputes about the design arising after a project was completed.

5.1.3.4. Costs

Costs that are incurred by the service provider when performing the services for the client may be managed in various ways.

This may include some of the following alternatives.

- Costs paid by the service provider, with the average cost level included within the service fees.

- Costs paid by the service provider and then reimbursed by the client.
- Costs passed on to the client for direct payment by the client.

5.1.3.5. Audits

Audits may be involved when the service provider processes financial transactions on behalf of the business.

For example, a contract administration services may process customer payments into a client's holding account, and make payments to end customers for refunds of credit account balances.

Audits would normally be performed by accounting and auditing firms that also audit the preparation of financial statements.

Customer service audits are performed by external agencies to review customer service standards.

This may involve an employee of the agency presenting anonymously as a customer of the business, and rating issues such as product knowledge and customer service approaches.

This may then involve a general assessment and rating of the customer service standards.

5.1.3.6. Data ownership, control & backup

In some arrangements, a considerable amount of information may be stored by the service provider.

For example, a service provider may store computer records of the business's customer details, transaction histories and so on.

This situation may raise a number of issues.

In cases where the business itself did not store the information separately, the back-up arrangements for computer data storage may be a significant issue.

Also, security in terms of data being provided to third parties, either deliberately or through unauthorised access, may also be an issue.

In these cases, the contract may specify that any data related to the service was the property of the business, that adequate computer backup facilities should be in place, and that information should not be released without authorisation and should be deleted or transferred on request.

5.1.3.7. Design ownership

The service contract would normally specify the ownership of any designs that were created as part of the project.

In the case of a specific project development, ownership of the design would normally rest with the client.

Custom designed computer software and graphic design of product logos may be examples of this situation.

In other cases, copyright or design ownership may remain with the service provider, with the service contract specifying license conditions.

For example, a photographic assignment may be conducted to produce images that may be used in an advertising campaign.

In some cases the copyright of the photographic image may remain with the photographer, with the client having exclusive use of the image for a period of time for purposes such as an advertising campaign.

5.1.3.8. Reporting

A service agreement may include a description of various regular reports that should be provided to the client.

This may include information such as income amounts processed, the number of new customers, and service response times.

Reporting may be used for two purposes.

Regular reports may be used to monitor the service levels that were being provided, and to ensure that the service levels did not fall below the standards that were included in the service agreement.

Also, these reports and data feeds may include information that was necessary for the management of the business itself, such as the cost and income amounts for a period of time.

5.1.3.9. Penalties & defaults

Default conditions

A default condition is a situation in which a specified part of a contract is not completed.

This may include a specified term in the contract not being performed by the other party.

Also, large agreements commonly include a list of default conditions, such as time frames for payments of amounts that are due, minimum service standards according to an independent rating system, time frames for project completion and so on.

The actions that may result in each situation may also be specified.

For example, this may include actions such as financial penalties, the right for the business to withdraw from the project, the right to have previous completed sections purchased by the other party at specified values, and so on.

Penalty clauses

It is common within large agreements to include a range of default conditions, and penalties that would apply in each case.

These may range from interest charges on overdue payments, through to termination of the arrangement and financial penalties if certain conditions arose, such as a major project stage not being completed within a certain timeframe.

These conditions may particularly apply to project developments, and other situations where the business could suffer considerable loss if the other party did not fulfil the contract conditions.

The inclusion of penalty clauses may reduce the risk to the business of financial loss in various circumstances, and also increase the chance that the original contract conditions will be fulfilled by the other party.

Minor penalties, such as interest payments, may generally pass with payment being made and the contract continuing, while major default conditions may result in court action as each party may attempt to minimise the loss that was incurred in the situation that had arisen.

Examples of the second condition may include a situation where a large and expensive product development project was conducted as a joint venture between two companies, however the project ended without an effective product design having being created.

No-fault clauses

"No-fault" clauses specify conditions under which penalties may not arise.

These clauses may be used in high-risk business situations, where there may be a significant risk of financial loss occurring in the project.

A no-fault clause is included within a contract to reduce the risk of other parties successfully suing the business in the event that a project or activity ended with losses occurring.

For example, a business may enter a joint venture arrangement with another business to attempt the launch of a product within a new market.

A no-fault clause may be included in the agreement, to clearly specify that, in the event that the product launch was unsuccessful, no additional costs would be incurred by the business, and that the losses would be limited to the payments that had already been made.

5.1.4. Development of a service agreement

In the case of standard services, a set of products and service levels would normally be available from the service provider.

The business would then select a product from the service provider, and a standard service contract would apply.

Service contracts are sometimes posted for tender.

This would involve publishing a notice of the offer to receive tender applications, together with a basic description of the service and contract details for the business.

The business may develop a complete service contract that would be provided to allow tenders to be submitted, or it may accept general expressions of interest which would lead to detailed negotiations.

In situations where only a few service providers were available, a business may contact a service provider directly.

This may result in purchasing a standard service product from the service provider, or in the case of larger transactions, a period of negotiations may take place.

5.1.5. Managing a contract arrangement

Effective management of a service contract arrangement may involve reviewing regular reports, ensuring that audits were conducted, and reviewing audit reports.

In the case of an informal service arrangement, addressing problems may involve discussions with the service provider, and raising issues that needed to be addressed.

In these situations, the only option available to the client if problems continued may be to completely withdraw from the service.

In the case of internal service providers, this may not always possible, and problems may continue on an irregular and permanent basis.

In the case of a detailed service level agreement, the business may have the option of exercising penalty clauses when default conditions arose.

Penalty clauses would generally be exercised by default.

However, penalties may sometimes be waived in situations where an event occurred that was outside the control of the service provider and would not normally be planned for.

A long break in the commercial electricity supply may be an example of this situation.

In the case of project developments, two major issues arise.

The first is to ensure that the original specifications are laid out clearly and in detail.

This may involve an initial list of requirements prepared by the business, which should generally cover all the major issues involved.

The project developer may the produce a detailed design based on the requirements specified by the business.

Construction should not commence until the business had reviewed and signed the complete design.

Also, regular reviews of the project progress, and the structure of the item as is it built, may ensure that the project remains on schedule, and that the item that was constructed matched the design that was expected by the business.

5.1.6. Operating a service or project development business

Operating a service or project development business may involve the general issues of creating and developing a business activity.

Economies of scale may be particularly important in these activities.

Clients would normally accept services only when the cost of the service was lower than the cost that could be achieved by using an equivalent in-house service.

Also, some service industries are highly competitive, with a number of service providers supplying similar services, and price may be a major factor in the client's selection of a service provider.

Customer service standards, response times and error rates may be important issues within a business of this type.

These issues may directly affect service contract conditions, and may they may also affect the growth of the business and the number of new clients during future periods.

Effective management of the internal operation could be used to ensure that these issues did not develop into problems for the business operation.

5.2. Probability, risk & statistics

Probability involves issues concerning future events.

The future cannot be predicted.

In some cases, events may unfold as one would expect.

In other cases, a clear path of future events may seem likely, and suddenly an event may occur that completely erases all expectations, and the likelihood of particular future circumstances occurring.

Expectations of the future are often that the future will be similar to the present, with a few minor changes.

In practice, events are often highly unexpected when they occur.

Unexpected events are a common part of the business environment, and plans, directions and probabilities cannot predict what will happen in the future.

However, decisions must be made, and in some situations it would appear that some events are more likely to occur than others.

Probability involves applying mathematics to issues relating to the chance of particular future events occurring.

Statistics involves analysing sets of numbers.

This may include determining properties of the set of numbers, and estimating the relationship between different sets of numbers.

5.2.1. Sets of numbers

5.2.1.1. Single variables

5.2.1.1.1. Averages

5.2.1.1.1.1. Simple Averages

An average of a set of numbers represents a typical or central point within the group of numbers.

The most widely-used measure of an average is known as the "arithmetic average".

In statistics this figure is known as the "mean".

The arithmetic average can be calculated using the following formula.

$$\text{average} = \frac{\text{sum of the individual items}}{\text{number of items}}$$

For example, the following table presents a set of cash flows for a twelve month period.

1012
1004
1037
999
970
1023
952
1039
1020
1015
997
964

The average cash flow could be calculated using the following approach

$$\text{average} = \frac{1012 + 1004 + 1037 + 999 + 970 + 1023 + 952 + 1039 + 1020 + 1015 + 997 + 964}{12}$$

$$= 1002.7$$

This figure represents a central point within the set of numbers.

In this example, this could be interpreted as a cash flow that may be received in a typical month.

The total amount of an item can be calculated using the following formula

$$\text{total} = \text{average} \times \text{number of items}$$

For example, assuming that the cash flows continued at the current rate, the total cash flow over a two year period could be calculated using the following example.

$$\text{total} = 1002.7 \times 24$$

$$= 24,064$$

Averages can be used to determine the typical figure that may apply in a business situation.

In turn, these figures could be used in calculations for determining figures such as margins, and to determine the current business conditions.

For example, the margin of sales to costs could be calculated using figures for a full year.

However, a new product launch or a change in operations may result in sales stabilising at a new level.

In these circumstances, a calculation using the average monthly figure for recent months may produce a more accurate estimate of current conditions than using figures based on the full year period.

An average from a sample can also be used to estimate the total amount over a larger range of items, such as a longer period of time, or a larger number of products.

5.2.1.1.1.2. Weighted Averages

In some situations, one number may have a higher or lower impact on an average measure than another number.

For example, a calculation may be performed to determine the average interest rate across the debts of the business.

In this case, the interest rate paid on a large debt would have a greater impact on the effective interest rate than the rate paid on a small debt.

Situations such as this can be addressed by using a “weighted average” calculation.

In the context of finance and statistics, a “weight” does not generally refer to physical weight.

In these contexts, the weight of a number refers to the number’s significance or impact on the total amount of a set of numbers.

The weighted average can be calculated using the following formula.

$$\text{weighted average} = \frac{\text{sum of "value} \times \text{weight" for each item}}{\text{sum of the weight amounts}}$$

For example, a business may have the following three debts

Amount	Interest Rate
100	8
20	9
25	6.5

The weighted average interest rate could be calculated using the following example

$$\text{average} = \frac{100 \times 8 + 20 \times 9 + 25 \times 6.5}{100 + 20 + 15}$$

$$= 7.9\%$$

The total amount of a figure can be calculated using the following formula

$$\text{total} = \text{weighted average} \times \text{total of the weights}$$

For example, the total interest paid on the business's debt could be calculated using the following example.

$$\text{total} = \frac{7.9}{100} \times (100 + 20 + 25)$$

$$= 11.4$$

This illustrates that the weighted average calculation determines the effective average of the set of numbers.

Weights may often be percentages or proportions.

For example, if the income from a business operation was derived from the following three products, then these percentages could be used as weights to determined figures such as the average costs for each product.

Product	Proportion of Sales
Product A	10 %
Product B	75 %
Product C	15 %

In this case, product B is the source of 75% of the business sales, and costs related to product B may have a greater impact on the total costs of the business than costs that were related to product A.

5.2.1.1.1.3. Alternative measures of the average

Various other approaches are also taken to measuring averages.

The “mode” is the most common single value occurring in a large set of similar numbers, although this figure is rarely used in practice.

The “median” is the number which involves half the data set being larger than the median, and half the data set being smaller than the median.

The median can be useful as a measure of the average when a small sample of numbers is available, and when extreme values may occur in the set of numbers.

In these circumstances, a single data value may have a large impact on the average, and the median may be a more stable measure of the central point within the data set than the mean.

The “geometric average” is used for sets of numbers that are multiplied together, such as investment returns.

This is calculated using the following formula

$$\text{Geometric average} = \left[\text{product of the items}\right]^{\left(\frac{1}{\text{number of items}}\right)}$$

Adding the arithmetic average to itself leads to the total of the data set, while multiplying the geometric average by itself also leads to the total of the data set.

The geometric average can be used to represent a central point when the total value of the data set is determined by multiplying, rather than adding, the individual items.

5.2.1.1.2. Standard deviation

In addition to determining the average of a set of numbers, the variation within the numbers can also be measured.

A set of numbers that all have similar values would have a small variation, while a set of numbers that were widely different would have a large variation.

The most widely used measure of variation is known as the “standard deviation”.

This is also used in the form of the “variance”, which is equal to the standard deviation squared.

The standard deviation can be calculated using the formula listed in the formula summary beginning on page 1106.

Alternatively, this function may be available on pocket calculators that include statistical functions, and within computer software such as spreadsheet programs.

The standard deviation can be thought of as the average distance that a data point is from the average value.

Technically, it is the square root of the average of the squared differences.

In the case of the earlier example, the following figures would apply.

	1012
	1004
	1037
	999
	970
	1023
	952
	1039
	1020
	1015
	997
	964
Average	1002.7
Standard Deviation	28.0

In this case, the standard deviation of the cash flows has a value of 28.

In other terms, a typical monthly figure may be around 28 larger or smaller than the average of 1002.7.

For example, some typical figures could be calculated using the following approach

$$\text{low figure} = \text{average} - \text{standard deviation}$$

$$= 1002.7 - 28$$

$$= 974.7$$

$$\text{high figure} = \text{average} + \text{standard deviation}$$

$$= 1002.7 + 28$$

= 1030 .7

When standard deviation is applied to a series of numbers over time, this may be interpreted as the volatility of the particular value.

For example, the volatility of a share price or a raw material price could be calculated using a standard deviation calculation.

A highly volatile price would have a high standard deviation figure, while a stable price would have a low standard deviation.

5.2.1.1.3. Time series

Some data series apply to a set of different items, while other data series apply to changes through time.

For example, the cost prices of a list of different products, or the value of a set of assets, are both static sets of numbers.

These numbers could be analysed using the average and standard deviation calculations from the previous section.

Data series that apply through time may include the price of raw materials, the sales received in each period, asset values at different points in time and so on.

These figures can also be analysed using averages and standard deviations.

However, in the case of time series, other issues may also apply.

For example, the underlying average and volatility of the data items may not be constant.

In these cases, the underlying average or standard deviation of the data items may change through time.

These affects can be reviewed by calculating figures based on a section of time, and reviewing the trend that occurs as the data series progresses.

5.2.1.1.3.1. Trends

In some cases the average or standard deviation of a data series may change over time.

For example, the average level of sales may steadily rise or fall over a long period of time, even through individual months may have high or low sales.

The following table presents the monthly cash flows for a three-year period.

Each average and standard deviation figure applies to the previous twelve monthly cash flows.

In this example, the both the average cash flow and the volatility of the cash flows has risen steadily over time.

This effect may not be clear from reviewing the individual monthly figures, as there may be large random rises or falls from one month to the next.

Month	Cash Flow	12-month Average	12-month Standard Deviation
1	1058		
2	1132		
3	1188		
4	1175		
5	1175		
6	1377		
7	1343		
8	1402		
9	1406		
10	1417		
11	1584		
12	1566	1319	171
13	1699	1372	182
14	1723	1421	191
15	1647	1460	186
16	1651	1499	169
17	1853	1556	165
18	2125	1618	222
19	1749	1652	207
20	2223	1720	248
21	1985	1769	238
22	2065	1823	224
23	1859	1845	211
24	1926	1875	192
25	1922	1894	184
26	2658	1972	279
27	1966	1999	260
28	2353	2057	253
29	2556	2116	282
30	2447	2142	297
31	2276	2186	272
32	2974	2249	355
33	2597	2300	357
34	2698	2353	366
35	2823	2433	354
36	2416	2474	316

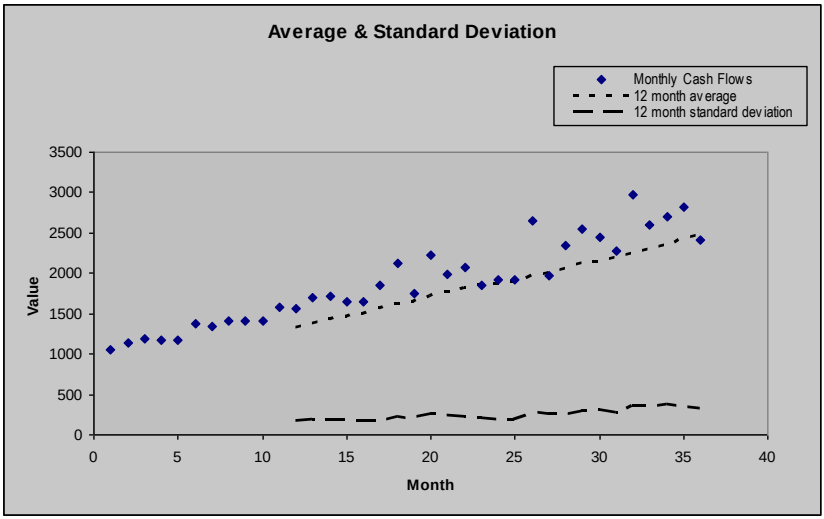


Figure 5

The calculation of a trend average is known in investment analysis as a "moving average".

This approach may also be useful in business analysis to highlight rising or falling trends in sales, margins, costs and so on.

5.2.1.1.3.2. Seasonal Data

In many business situations, figures may vary according to the time of the year.

In these cases, trends over a short time period, such as a few months, may reflect seasonal changes, rather than a change in the business itself.

Various statistical formulas and approaches are used in attempts to determine underlying trends within seasonal data, particularly in the case of economic data.

However, in many practical business circumstances there may be limited information than can be determined by following these approaches.

Determining a clear trend requires a reasonable number of data points, and in the case of seasonal data, an entire year may effectively form a single data item.

In practice, the trend being measured may change at a faster rate than the number of data points that are available to measure it.

However, one approach in these circumstances may be to compare figures against the same period in the previous year, rather than comparing figures to previous months.

This approach may be used in production reports, comparing sales figures to previous periods and so on.

Also, a trend may be identified in some cases by comparing each individual month to the previous year, and determining the average change.

For example, the following data presents a set of seasonal sales figures, with the percentage change from the same month in the previous year also included.

Month	Sales	Change
1	1103	
2	1948	
3	1392	
4	1910	
5	1380	
6	1183	
7	380	
8	520	
9	580	
10	733	
11	444	
12	1360	23%
13	1701	-13%
14	1963	41%
15	1558	-18%
16	1690	23%
17	1602	35%
18	1049	176%
19	546	5%
20	609	5%
21	413	-44%
22	262	-41%
23	910	-33%
24	1398	-18%
25	1644	-16%
26	1805	16%
27	1513	-10%
28	1612	1%
29	1767	68%
30	1142	109%
31	1154	90%
32	866	110%
33	408	56%
34	243	-73%
35	1103	-21%
36	1198	-27%
Average		18%

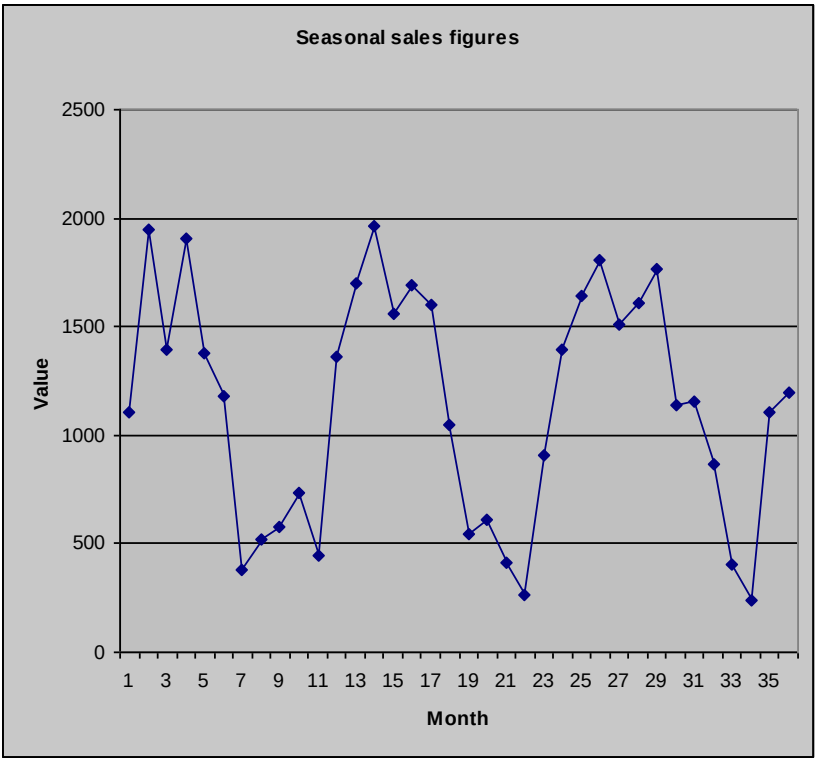


Figure 6

These sales figures illustrate a seasonal pattern of sales occurring at a particular time of the year.

In situations such as these, underlying trends within the business operation may not be able to be determined by reviewing the change in figures from one month to the next.

However, the previous table includes the percentage change in each month from the same month in the previous year.

These figures indicate that, on average, the sales in any particular month were 18% higher than the sales of the same month in the previous year.

Due to the highly volatile sales figures and the seasonal nature of the sales, this trend may not have been easily identified from reviewing the individual monthly figures.

5.2.1.2. Multiple variables

In some situations, two separate variables may be related.

For example, the amount of money spent on advertising may have an impact on the sales figures of the business.

In these cases, the relationship between the two sets of numbers can be analysed.

5.2.1.2.1. Correlation

“Correlation” is a measure of a linear relationship between two data sets.

The value of the correlation number may vary between -1 and +1.

A correlation of zero suggests that the data sets may be independent.

In these cases, a value in one data set may not be affected by the corresponding value in the other data set.

A correlation of +1 indicates that the data sets are perfectly related, and a rise or fall in one data set is matched by a proportional rise or fall in the other data set.

A correlation of -1 indicates that the data sets are perfectly negatively related, with a rise in one data set being matched by a fall in the other data set.

Correlations that are not 0, -1 or +1 indicate that the data may be partly related, and also partly independent.

For example, the sales level may be affected by the advertising budget, and may also be affected by other factors.

The correlation value can be calculated using the formula listed in the section beginning on page 1106, or by using a pocket calculator or a computer program.

For example, the following set of data includes a list of advertising expenses and sales figures for a period of time.

Advertising	Sales
7	104.6
13	101.3
8	101.3
13	104.7
14	109.5
6	102.9
8	107.3
15	110.1
8	97.1
8	102.3
12	110.7
8	97.7

Correlation	0.58

In this example, the figures have a correlation of 0.58.

Correlation is also expressed as a percentage, such as 58 % in this case.

The positive correlation figure suggests that high values of the advertising expense may be associated with high levels of sales.

The accuracy of this correlation could be estimated by using a confidence internal, as described in section beginning on page 648.

Also, the multiplication effect of the advertising expense to the sales increase could be estimated by using a regression, as described in section beginning on page 645.
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5.2.1.2.1.1. R-squared

When the correlation is squared, this number is known as the “coefficient of determination”, or more simply the “R squared”.

This terminology is based on the common usage of the letter “r” to represent correlation in statistics.

This figure can be interpreted at the proportion of one value that is caused by the other value.

For example, in the previous example, the following calculation would apply.

$$\begin{aligned} r-\text{squared} &= \text{correlation} \times \text{correlation} \\ &= 0.58 \times 0.58 \\ &= 0.34 \end{aligned}$$

Assuming that the advertising expense caused the sales change and not the other way around, this would indicate that 34 % of the sales figure was related to the advertising expenses, and the remaining 66 % was related to other causes.

5.2.1.2.1.2. Properties of correlation

The correlation value applies in both directions, and does not indicate that one data set causes a result in the other data set.

For example, both data sets could be affected by an independent third factor, rather than one data set causing an effect within the other data set.

Correlation is independent of the average and the standard deviation.

For example, two data sets could have a correlation of +1, indicating that they moved in perfect proportional changes, however, the data sets could have different average values and different standard deviations.

Unless the correlation is +1 or -1, correlation does not indicate a direct proportional move.

For example, a correlation of 0.5 does not indicate that one data item moves by one-half of the amount of the other data item.

In these cases, both data sets remain random and any values could occur.

The correlation simply indicates the average value than may occur in one data set, corresponding to a particular value in the other data set.

Correlation only indicates a linear, straight-line relationship between two data sets.

Two data sets could be related according to a non-linear relationship, such as a curve, and yet may have a correlation of zero.

5.2.1.2.2. Regression

5.2.1.2.2.1. Linear regression

In cases where one data set causes the effect in the other data set, an estimate can be made of the average result that may occur for the second data value.

For example, using the previous figures, a prediction could be made of the sales that may result if a particular level of advertising expenses was chosen.

This is known as regression analysis, and may involve determining a formula for calculating one figure from the other figure.

The formulas for calculating these values are included in the section beginning on page 1106, and are generally included with statistical functions in calculators and computer programs.

The aim of a regression calculation is to determine the values of "a" and "b" in the following equation

$$\text{secondvalue} = a \times \text{firstvalue} + b$$

Using the data from the previous example, the following figures would apply

A	0.84
B	95.7

In other terms, a linear regression model of the previous figures would produce the following formula

$$sales = 0.84 \times adverti\ sin\ g + 95.7$$

This figure would only determine the average level of sales due to advertising, and both the average level of sales and the individual sales figures may also be affected by other issues.

For example, if the advertising budget was set to 15, the average predicted sales level could be calculated using the following example

$$sales = 0.84 \times 15 + 95.7$$

$$= 108.3$$

The "A" value can be interpreted as the multiplier factor that applies to the first data value.

In this example, the sales level would be related to 0.84 times the advertising expense.

In other terms, a single dollar of advertising expense would relate to an 84 cents increase in sales.

This data would suggest that the particular advertising program used was not cost effective, as sales increased by a smaller amount than the cost of the advertising.

5.2.1.2.2.2. Multiple linear regression

Regression can also be performed when a data value is related to two or more other data values.

This is known as multiple linear regression.

A large number of calculations may be involved in determining the coefficients in the equation, and computer software would normally be used to determine these values.

For example, a chemical process in a production facility may use three raw materials, with the volume of the chemical being produced being related to the amount of each raw material that was included.

This could be represented in the following equation.

$$\text{output} = a \times \text{input } 1 + b \times \text{input } 2 + c \times \text{input } 3 + d$$

The regression process would estimate the values for “a”, “b”, “c” and “d”.

5.2.1.2.2.3. Non-linear regression

Regression can also be performed when the relationship between the two variables is not linear.

In other terms, a graph of the two variables would show a curved shape rather than a straight line.

For example, the cost per unit of a manufacturing plant may be related to the production capacity by a curve, not a straight line.

In these circumstances, the data points can be converted to linear points using the relationship between the variables, and then the standard linear regression formulas could be used. (** check details).

5.2.1.2.3. The relationship between correlation & regression

The correlation and regression values are linked by the following formula.

$$a = \frac{\text{standard deviation of second data series}}{\text{standard deviation of first data series}} \times \text{correlation}$$

In this formula, the “a” value is the coefficient in the regression equation that is multiplied by the first data value, not the value that is added to the equation result.

5.2.1.3. Ordering of data sets

Average and standard deviation figures are not affected by the order of the items within the data set.

In the case of a correlation or regression, the value is not affected by the order of the data set, however each data point within one data set must correspond to a single data point within the other data set.

5.2.1.4. Confidence intervals

In cases where the data may represent a sample of a larger data set, a figure, such as an average, that is calculated from the sample may not match the figure than applies to the full set of data.

Samples may apply when a small group of items is used, such as a sample of products, or a survey of customers.

Also, in the case of data such as a history of market prices, the data may effectively represent a sample of the underlying effects that are causing the price changes.

In these situations, an estimate may be made of the likely range of the actual value within the full set of data, based on the value that was calculated from the sample, the number of data points, and a specified probability accuracy level.

This calculation is known as a confidence interval.

A confidence interval can be calculated by using the following formula

(** confidence internals)

The confidence interval gives a minimum and maximum range for a value, based on the size of the data sample.

This is based on the probability that the true average or other figure is within the specified range.

For example, the average value of a cash flow series may be calculated as 74.

Based on a confidence interval calculation, there may be a 95% probability that the actual average of the underlying data series is within a range such as 68 to 80.

The confidence interval becomes narrower as the number of data points within the calculation is increased, and wider as the specified accuracy of the confidence level is increased.

For example, a confidence internal around the calculation of an average value would be narrower when 100 data points were used to calculate the average, than when 20 data points were used.

In contrast, if the specified accuracy level was increased from a probability level of 95% to a level of 99%, the range of values would become wider.

(** t-tests)

5.2.1.5. Samples

In some cases, statistics can be calculated from a full set of values.

For example, in the case of parts that were manufactured to a specified tolerance, each individual part would generally be weighed or measured.

In other cases, a sample of data from the full set of information may be used.

5.2.1.5.1. Samples

For example, a survey of customer interest in a product may be conducted, to asses the likely interest within a wider range of potential customers.

In the case of a manufacturing example, the crush strength of an item can only be effectively measured by placing the item in a testing machine and measuring the item strength under a crush test.

This is known as destructive testing, and in these cases a small sample would be used to estimate the properties of the full set of products.

In other situations, non-destructive testing procedures can be used, using methods such as ultrasound and x-ray scanning.

In cases where sample testing is used, a larger sample would generally provide a more accurate estimate of the actual value of the parameter within the full set of products.

A confidence interval may be calculated based on the sample size, to estimate the probability that the figure within the full set of items was within a particular range around the value that was calculated from the sample.

5.2.1.5.2. Sample sizes

Where possible, the largest practical data sample should generally be used to calculate a statistical result.

A few dozen figures may provide a reasonable estimate of an average or a standard deviation in a general business analysis, although a large data sample would allow a more accurate estimate to be calculated.

For example, weekly price returns or sales figures could be used instead of monthly figures, to allow a more accurate estimate of volatility to be made.

The use of weekly rather than monthly figures would not affect the average.

5.2.1.5.3. Sample selection

The selection of a sample may have a significant impact on a calculated result.

Statistical analysis generally assumes that a sample has been chosen at random from the full data set.

The method that is used to select a sample may result in the sample results being an inaccurate representation of the total set of items.

For example, if the sample products for a manufacturing sample were all selected from a single batch of products, or the customers that were surveyed were selected in a particular way, then the results of the calculations may not reflect the actual results that may apply to the full set of data.

Sample selection is a major issue in performing a statistical analysis.

Calculations themselves may be reasonably straight forward, however to ensure an accurate result, in some cases a considerable amount of effort may be required to create a sample that may be a random selection from the full set of data.

For example, if a survey of customers was based on customers who received a regular newsletter from the business, this survey may only reflect the views of customers who regularly purchased the business's products, rather than the views of customers who purchased the items on an individual basis.

Problems with sample selection may be reduced by using some of the following approaches.

- Using random selection, such as a computer program, rather than manually selecting items.
- Selecting items from across the full range of products rather than selecting items from specific groups.
- Performing calculations from the full set of data, where this is practical.
- In cases where distinct separate sub-groups within the full data set are involved, such as several products, sub-samples may be selected from each group in proportion to the group size. In some cases this may be against the theory of random selection, however in practice this may produce a more relevant result.

5.2.2. Probability

5.2.2.1. Chance

Probability refers to the chance of future events occurring.

Based on past history, certain events may appear to be more likely to occur than others.

Also, when certain actions have been repeated many times, certain patterns have emerged.

Although events cannot be predicted, and the future is unknown, these patterns may form some basis for decisions made in the present time.

For example, when a coin is tossed a very large number of times, the number of heads and tails tends to average to a level of approximately 50% heads and 50% tails.

However, the average rarely equals exactly 50%, and large variations in results can occur.

Aside from issues relating to future events, a “deterministic” process is a process in which the outputs are directly related to the inputs.

For example, the processing rate of a machine may be directly related to the setting that is selected, while the costs of a business may be directly related to the purchase decisions that are made.

A “stochastic” process is a process that incorporates random elements.

In these cases, the outcome of the process cannot be directly predicted.

Faults generated by machine processing are an example of a stochastic process.

Also, the number of customers appearing at a business location within a period of time is also a stochastic value.

5.2.2.2. Probability

The probability that an event may occur can be expressed mathematically as a number between zero and one.

A probability of zero indicates that the event will not occur.

A probability of one indicates that the event is certain to occur.

A probability between zero and one indicates that there is a chance that the event may occur.

For example, a probability of 0.5 indicates that the event would be expected to occur around half the time.

This is sometimes expressed as a percentage, in this case being 50%.

For example, a standard dice with the numbers 1 through to 6 may be thrown.

The probability of the number 7 occurring would be zero, while the probability of a number less than 7 occurring would be one.

The probability of a two appearing would be one-sixth, or 0.167.

5.2.2.3. Types of events

Probability generally involves certain events occurring.

The word “event” in this context has a wide and general meaning.

For example, the fact that the price of a raw material may have a certain value on a certain day would be an example of an event, which may have a certain probability.

Statistical events may fall into two categories.

The first relates to events that may or may not occur within a period of time.

For example, a shortage of raw materials may or may not occur within a particular month.

This is a time-based event.

The second type of event involves a specific situation were several possible outcomes could occur.

For example, a dice may be thrown.

In this case, one of a range of possible outcomes may occur.

The act of throwing the dice is referred to as a “trial”, while each of the possible results is known as an “outcome”.

The probabilities of each of the possible outcomes must sum to one, as it is certain that one of the possible outcomes will occur.

In the case of the dice, time periods are not involved, and a throw of a dice is certain to produce one of the six possible numbers.

5.2.2.3.1. Individual events

Individual events may involve to a specific event which may or may not occur.

For example, a tender may be submitted to perform a project development.

The tender would either be accepted or rejected, with an announcement being made at a certain time.

This is an example of a specific event

A single probability applies to the chance than the event will or will not occur.

5.2.2.3.2. Time-based events

Some events could occur at different points in time.

In this context, the length of time affects the probability that the event may occur.

For example, a building may be insured against fire.

The probability of the building being destroyed by fire at some time within the next five years would be greater than the probability of the building being destroyed by fire within the next month.

In these cases, the probability of the event occurring is related to the period of time that is considered.

5.2.2.3.3. Time series

Some data values change continually as time passes.

The price of items sold in markets is an example of this.

In these cases, a number of events could be defined, each with a separate probability.

For example, one event may refer to the chance that a price would be below a certain point at some time within a time period, while another event may refer to the chance that a price may end a period of time with a value that is higher than a certain limit.

Analysis of time series is often based on the standard deviation of the data.

This allows the probability that a number will be outside a particular range to be determined.

5.2.2.4. Calculating probability

5.2.2.4.1. Mathematical

In the case of some events, the probability of the event occurring can be directly calculated mathematically.

Equally-likely events

For example, the probability that one of a set of equally-likely events will occur is equal to one divided by the number of values.

In the case of several equal events, such as coins and dice, the probability of an individual value appearing can be calculated using the following formula.

$$\text{probability} = \frac{1}{\text{number of items}}$$

For example, in the case of a standard six-sided dice, the probability of a 4 appearing can be calculated using the following example

$$\text{probability} = \frac{1}{6}$$

$$= 0.167$$

Distributions

In other cases, an assumption is made about the pattern of the data items.

This is known as a “distribution”.

Distributions are discussed in section beginning on page 671.

Assuming a certain pattern, the probability that an event will occur can be calculated.

In practice the most widely-used distribution is the “normal distribution”, and the standard deviation may be used to calculate the probability that a number will be within a certain range.

5.2.2.4.2. Historical

In many cases the probability of an event occurring cannot be directly determined.

Estimating the probability that an event may occur is often based on historical data.

For example, in the previous case of the building fire risk, fire records may indicate that 45 buildings were destroyed by fire within an area containing 1500 buildings, over a specified period of time.

The term "trial" is sometimes used to refer to a situation where the event could have occurred, and an "event" is an actual occurrence of the event.

In these cases, the probability of the event occurring can be calculated using the following formula

$$\text{probability} = \frac{\text{number of events}}{\text{number of trials}}$$

In the example of the building fires, this could be calculated in the following way.

$$\text{probability} = \frac{45}{1500}$$

$$= 0.03$$

As another example, a trial distribution of a new product may involve 150 samples being distributed, with a total of 30 sales being received.

The probability of receiving a sale could be calculated using the following example.

$$\text{probability of a sale} = \frac{\text{number of events}}{\text{number of trials}}$$

$$= \frac{30}{150}$$

$$= 0.2$$

5.2.2.4.3. Simulation

In some cases, a computer model can be build of the situation in question.

For example, engineering design commonly uses computer simulations to determine the results that would occur when a physical design was subject to various conditions.

Another example may include a business with a range of different products, cost structure and margins.

Simulation can be used to construct a model of the system, generate a large number of random events, and determine the probability that certain events may occur.

Using the product example, a range of different sales levels could be used as inputs to the system and used to determine the probability of a profit or loss occurring, assuming a certain chance of different sales levels.

5.2.2.5. Estimating numbers of events

When the probability of an event occurring has been estimated, the average number of events that may be expected can be calculated using the following formula.

$$\text{average number of events} = \text{number of trials} \times \text{probability}$$

For example, in the previous case of the sample products, the sales occurred with a probability of 0.2.

If a larger distribution of the product was launched, with a total of 2000 potential sales being arranged, then the number of successful sales could be estimated using the following calculation

$$\text{average number of events} = \text{number of trials} \times \text{probability}$$

$$= 2000 \times 0.2$$

$$= 400$$

This example assumes that the same conditions applied to the original trial product launch and to the full product launch.

Also, this calculation only estimates an average figure that may occur.

The actual figure that occurred in a single situation involving the product launch may be quite different from the average figure that was estimated.

5.2.2.6. Combining probabilities

(** Independent events, and/or/not events, within the one trial/separate events, coin/dice, mutually exclusive events, conditional events, scenarios.combinations of successful/unsuccessful events.)

5.2.2.6.1. “Not” events

The probability that an event will not occur is equal to one minus the probability that it *will* occur.

This result can be calculated using the following formula

$$\text{probability of not occuring} = 1 - \text{probability of occuring}$$

For example, the probability of throwing a 5 when a dice is thrown is equal to one-sixth, or 0.167.

The probability of throwing a number that is not a five can be calculated using the following example

$$\text{probability} = 1 - 0.167$$

$$= 0.833$$

5.2.2.6.2. “And” events

The probability that two events will both occur is equal to the individual probabilities multiplied together.

This may be is summarised in the following formula.

$$\text{probability of both "a" and "b"} = \text{probability of "a"} \times \text{probability of "b"}$$

For example, if a coin is tossed and a dice is thrown, the probability of a tail appearing is 0.5, while the probability of the dice showing a 4 is 0.167.

The probability that a single throw of a dice and a single toss of a coin will produce a 4 and a tail can be calculated using the following example.

$$\text{probability} = 0.5 \times 0.167$$

$$= 0.0835$$

When several events are involved, each individual probability is multiplied together to determine the probability that all events will occur.

For example, in the case of events “a”, “b”, “c” and “d”, the probability that all four events would occur could be calculated using the following formula.

$$\text{probability} = a \times b \times c \times d$$

5.2.2.6.3. “Or” events

Multiple outcomes within a single trial

In the case of a single trial, the probability that either one outcome or another outcome may occur can be determined by adding the probabilities together.

For example, the following formula could be used.

probability of outcome "a" or "b" = probability of outcome "a" + probability of outcome "b"

The probability of both outcomes occurring is zero, since each outcome is defined as a separate possibility, and both cannot occur at the same time.

For example, a single throw of a dice cannot produce a 3 and also a 5.

In the case of a dice being thrown, the probability of either a 2 or a 6 being thrown could be calculated using the following formula.

$$\text{probability} = 0.167 + 0.167$$

$$= 0.334$$

In the case of several outcomes, the probability that any one of a set of outcomes may occur is equal to the sum of the individual probabilities.

Separate events

In the case of separate events, a different situation applies.

In this case, the probability that either one event, or the other event, or both, will occur can be calculated by determining the opposite value, and subtracting it from one.

This can be calculated using the following formula

Probability of "a" or "b" occurring = 1 – probability of "a" not occurring x probability of "b" not occurring

This formula could also be expressed in the following form.

Probability of "a" or "b" occurring = 1 – (1 - probability of "a" occurring) x (1 - probability of "b" occurring)

For example, the probability that either a head will be tossed or a 1 will be thrown, or both, can be calculated by determining the probability that a head will not be tossed and that a 1 will not be thrown.

For example

Probability that head will not be tossed = 1 – 0.5

= 0.5

Probability that a 1 will not be thrown = 1 – 0.167

= 0.833

Probability that a head will not be tossed and that a 1 will not be thrown

= 0.5 x 0.833

= 0.4165

Probability of either a head being tossed or a 1 being thrown

= 1 – 0.4165

= 0.5835

In many probability calculations, a simpler calculation can be performed by calculating the probability of the opposite result occurring.

The probability of the original result can then be determined by subtracting the figure from one.

5.2.2.6.4. “Exclusive Or” events

An exclusive-or event occurs when either one event occurs, or the other event occurs, but not both.

The probability of this occurring can be calculated using the following formula.

Probability of either "a" or "b" occurring but not both =
Probability of "a" + probability of "b" – 2 x probability of "a" x probability of "b"

For example, the probability that a head will be tossed, or that a 1 will be thrown, but not both, can be calculated using the following approach.

$$\text{Probability} = 0.5 + 0.167 - 2 \times 0.5 \times 0.167$$

$$= 0.5$$

5.2.2.7. The value of uncertain cash flows

5.2.2.7.1. Single events

In some situations, a future cash flow may or may not occur.

For example, payments due from customers may or may not be received.

In the case of the building example, a fire in the building may require a payment to construct a new building.

In these situations, the effective value of the cash flow can be determined from the size of the cash flow, and the probability of it occurring.

In these cases, the effective value of the cash flow can be calculated using the following formula

$$\text{effective value} = \text{amount} \times \text{probability}$$

This equation specifies a fundamental relationship between effective values and probabilities.

This issue may arise in many areas of business and finance, including areas such as valuing projects, calculating insurance premiums, and planning activities such as product launches.

If the cash flow may occur at a date in the distant future, then the present value may also need to be calculated using a present value calculation, as described in the section beginning on page 734.

For example, a new product may be launched, with an estimated 80% chance of success.

The value of the new product, if successful, may be $50.

In this case, the value of the product before the launch could be calculated using the following example

$$\begin{aligned} \text{value} &= 50 \times 0.8 \\ &= 40 \end{aligned}$$

If the product was to be sold prior to launch, then the value of the product would be $40.

After the launch was completed, the value would be either $0 or $50.

This approach may enable a value to be placed on uncertain future events, before they occur.

Valuing future events may be used for some of the following purposes.

- Calculating asset values as part of preparing a balance sheet.
- Determining the potential profit or loss before making a decision as to whether to proceed with a project.
- Estimating a sale price for the sale or purchase of a project or a transaction.
- Determining the risk and potential losses that the business may be exposed to.

As another example, a building with a value of $100 may have a probability of 0.02 of being destroyed by fire within a 1-year period.

The effective value of this potential cash flow could be calculated using the following approach

$$\text{value} = 100 \times 0.02$$

$$= 2$$

This approach may be used to calculate an insurance premium for a fire insurance policy.

This is also known as the “price of risk”.

5.2.2.7.2. Uncertain values

In some cases, a cash flow or value may be expected to occur, however the size of the cash flow may be unknown.

This may apply to values such as future sales income, future materials costs and so on.

In these cases, the effective value of the cash flow is equal to the average of the possible values.

The average value can be calculated from the average value of a data series.

Alternatively, the average value may be determined from the weighted average value of a set of possible outcomes, with each value weighted according to the probability of it occurring.

For example, monthly cash flow may have an average value of $890 and a standard deviation of $25.

In this case, the effective value of the next month’s cash flow would be $890.

The standard deviation of the values is a separate issue.

Mathematically the effective value of an uncertain cash flow is not related to the standard deviation.

However, a low value may be placed on businesses or projects that involve volatile or highly uncertain cash flows.

5.2.2.7.3. Scenarios

The value of a cash flow or asset value depends on the possible values that may occur, and the probability of each value occurring.

This applies in all cases, whether the value has a continuous range of possible values, of whether it has a discrete set of possible values.

For example, the value of an asset may have a continuous range of possible values, while a cash flow due to an insurance policy has only two possible values, either zero, or the full value of the building.

The effective value of an event can calculated as the weighted average of the possible values, with the probabilities of each outcome being used as the weights.

This may involve multiplying the probability by the value for each outcome, and adding the results together.

This calculation could be summarised in the following formula.

$$\text{value} = \text{sum of "value} \times \text{probability" for each possible outcome}$$

For example, in the case of a building insurance, the following possible outcomes may occur

Outcome	Cash Flow	Probability
Fire	100	0.02
No Fire	0	0.98

The value of this cash flow could then be calculated using the following approach

$$\text{value} = \text{sum of "value} \times \text{probability" for each possible outcome}$$

$$= 100 \times 0.02 + 0 \times 0.98$$

$$= \$2$$

The calculation may be more difficult in the case of a continuous range of possible outcomes, such as the market price of a raw material.

In some cases, an analytical equation can be used for this situation.

In other cases, the range of possible values could be divided into a number of separate bands, such as 100 separate sub-ranges, and a similar calculation to the previous formula could be used based on the individual sub-ranges.

Other examples of valuing uncertain values may include an estimate of the value of a new product launch.

This may be done by defining a set of scenarios, together with the value in each case, and an estimate of the probability of each outcome.

Scenario analysis may be used to value projects and activities such as product launches.

For example, the following estimates may be made for a product launch

	Value	Probability
Very favourable response	80	10%
Successful launch	60	30%
Reasonably successful launch	50	30%
Poor response	20	20%
Very low response	-10	10%

The value of this project could then be calculated using the following approach.

$$\text{value} = \text{sum of "value} \times \text{probability" for each possible outcome}$$

$$= 80 \times \frac{10}{100} + 60 \times \frac{30}{100} + 50 \times \frac{30}{100} + 20 \times \frac{20}{100} - 10 \times \frac{10}{100}$$

$$= \$44$$

The probability figures may be based on the estimates of the likely outcomes, rather than mathematical calculations.

The process of developing scenarios and performing the calculations may be useful in developing a clearer picture of the possible outcomes and the value of the project

5.2.2.8. Random variables

A “random variable” is a statistical concept that involves a data item that has random values from one point to another.

Examples of random variables in business situations may include the monthly cash flows, and the change in the market price of volatile commodities.

Characteristics of random variables

A random variable may have an average value, a standard deviation, and a probability distribution.

The distribution specifies the probability of various different values occurring.

A random variable has an important property, in that the value of the variable cannot be predicted from the previous values.

For example, the monthly cash flow for a business operation may be an example of a random variable.

Monthly cash flows may have an average value, and a standard deviation.

The value of the next monthly cash flow may not be able to be predicted from the values of previous cash flows, aside from determining an average value.

Non-predictability

The non-predictability of a random variable can be illustrated using an example of tossing a coin.

In the case that a long series of tails appeared, this would not indicate that there was an increased chance of a head appearing on the next toss of the coin.

Also, it would not indicate that a long series of heads could be expected, in order to balance the series of tails that had appeared.

In all cases, the chance of a head or a tail remains 50% on the next toss of the coin, and future coin tosses are not affected by tosses of the coin that occurred in the past.

Another perspective of this situation is that a coin is simply a disk made of metal.

A coin does not have a memory.

It does not know whether it has been tossed in the past or not, and future events are based on the structure of the coin, rather than previous tosses of the coin.

Although this effect may be against natural intuition, this issue is fundamental to random data and to issues of risk within business.

For example, when a market price falls or rises significantly, there is no reason to suggest that the price will reverse its previous move, to return to the original level.

Both in theory and in practice, the new value of the price sets the base level for any future positive or negative moves, and previous prices become largely irrelevant in estimating future prices.

This issue is related to the fact that a decision to sell an asset should not include issues relating to the purchase price or whether the transaction will generate a profit or a loss, but should instead consider only the future possible outcomes.

For example, if the price of an asset has fallen since the asset was purchased, a loss has already occurred, and this cannot be reversed by avoiding selling the asset at the current price.

Although the asset price may rise, there may be no particular reason to suggest that a rise in the price of a particular asset is any more likely than an increase in the price of another asset than could be purchased with the funds that could be raised from selling the asset.

Correlation

Although the value of a random variable is not related to previous values of the same variable, it may be related to other variables.

This effect may be measured using the correlation and regression approaches.

For example, the value of two random variables may be combined into a third value.

In the case of all three data sets, the values could not be predicted from previous values.

However, the value a data item in the third data set may be partly related to the value of the corresponding item in either the first or the second data set.

5.2.2.9. Data series & random walks

In the case of a data series such as monthly cash flows, the average value may be a constant figure.

In this case, a fixed average figure may apply to the data values, and a standard deviation may refer to the standard deviation of the data values.

Market prices often appear to operate on a basis known as a “random walk”.

In the case of a random walk, the average value of a data value is based on the previous data value, rather than a constant value.

In this situation, the percentage changes, rather than the prices themselves, may form a random variable with a stable average and standard deviation.

5.2.2.10. Probability Distributions

A probability distribution specifies the probability of each possible outcome occurring.

Probability distributions may be discrete, where there may be a specific list of possible outcomes, or continuous, where a data value may have an unlimited set of possible values, but with different probabilities of values occurring in different ranges.

For example, the throw of a dice has six possible outcomes, while the price of oil has a continuous set of possible values.

5.2.2.10.1. Linear

A linear distribution occurs when each outcome has an equal probability of occurring.

Coins and dice are examples of this.

Linear distributions can be discrete or continuous.

In the case of a discrete distribution, the probability of a particular outcome occurring can be calculated using the following formula.

$$\text{probability} = \frac{1}{\text{number of possible outcomes}}$$

In the case of a continuous linear distribution, the probability that a number may occur within a particular range of values can be calculated using the following formula.

$$\text{probability} = \frac{\text{maximum range value} - \text{minimum range value}}{\text{maximum possible value} - \text{minimum possible value}}$$

Random numbers that are generated by computer programs and calculators often have a continuous linear distribution.

5.2.2.10.2. Normal

A particular probability distribution is known as the “normal distribution”.

When a large number of separate effects are combined together, the net result becomes close to the normal distribution, regardless of the distribution of the underlying effects (** check details).

For example, although a dice has a linear distribution, if a dice is thrown many times, then the total amount from all the dice throws will have an approximately normal distribution pattern.

The normal distribution has the following appearance when presented as a graph.

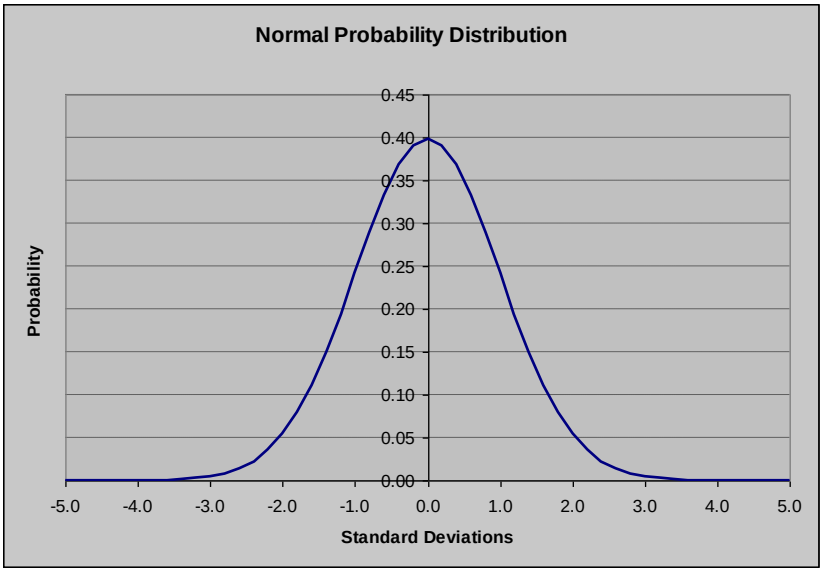


Figure 7

The height of a point on the graph indicates the probability that a value of that size may occur.

This indicates that the values close to the average have a high probability of occurring, while values far from the average have a very low probability of occurring.

For example, the probability of a number occurring between 1 and 1.2 standard deviations above the average could be calculated from the area of the graph, which would be related to the height of the curve around the 1.0 standard deviation point.

The probability of a data value occurring that is more than one standard deviation above the average is 16%, while the probability of a value occurring that is more than two standard deviations above the average is 2.3%.

Normal distributions occur in many contexts, ranging from the distribution of weights of manufactured items, to the percentage moves in market prices.

The assumption of a normal distribution allows the probability of certain value ranges occurring to be calculated.

5.2.2.10.3. Historical distributions

In some cases, historical data can be used to estimate the distribution pattern of a random variable.

For example, although the price of traded items often follows a normal distribution, this may sometimes be a “fat tailed” or “leptokurtic” distribution.

This means that the distribution shape is approximately equal to the normal distribution, however the ends of the distribution are larger than a normal distribution, and the probability of extreme high values or extreme low values occurring is higher than it would be if a normal distribution was in place.

In situations such as these, historical data can be used to estimate the shape of a distribution, to allow a more accurate estimate of probability to be made.

5.2.2.11. Probability of ranges

When a probability distribution is known or an assumption is made, the probability of numbers occurring within certain ranges can be calculated.

For example, the following table presents some figures that apply to a normal distribution.

These figures specify the probability that a number will be more than the specified distance away from the average.

Standard Deviations	Probability of a low figure	Probability of a high figure	Probability of a high or low figure
0.00	50.0 %	50.0 %	100.0 %
0.25	40.1 %	40.1 %	80.3 %
0.50	30.9 %	30.9 %	61.7 %
0.75	22.7 %	22.7 %	45.3 %
1.00	15.9 %	15.9 %	31.7 %
1.25	10.6 %	10.6 %	21.1 %
1.50	6.7 %	6.7 %	13.4 %
1.75	4.0 %	4.0 %	8.0 %
2.00	2.3 %	2.3 %	4.6 %
2.25	1.2 %	1.2 %	2.4 %
2.50	0.6 %	0.6 %	1.2 %
2.75	0.3 %	0.3 %	0.6 %
3.00	0.1 %	0.1 %	0.3 %

Figure 8

For example, based on this table, the probability that a number would be larger than 1.25 standard deviations above the average would be 10.6 %.

The probability is based on the number of standard deviations that the data point is away from the average.

This can be calculated using the following formula

$$\text{number of standard deviations} = \frac{\text{size of the change}}{\text{standard deviation}}$$

In the case of a data series with a fixed average, such as a set of cash flows or customer numbers, the following calculation can be used to determine the size of the change

$$\text{size of the change} = \text{new value} - \text{average}$$

In the case of a data value that is less than the average, this formula will produce a negative result.

However, only the size of the value itself, rather than the negative or positive sign, should be used to calculate the number of standard deviations of a change.

In this situation, the standard deviation may be calculated directly from the data values.

In the case of data points following a random walk pattern, such as market prices, the following calculation may be used

$$\text{size of change} = \frac{\text{new value} - \text{old value}}{\text{old value}}$$

In this case, the standard deviation may be calculated as the standard deviation of the percentage changes from one data point to the next, rather than being calculated directly from the data values.

For example, the following two data series may apply to a set of cash flows and market prices.

	Cash Flows	Market Prices	Price Change
	994	950	
	882	819	-14%
	959	906	11%
	1009	1028	13%
	998	902	-12%
	949	788	-13%
	930	676	-14%
	1034	807	19%
	1034	739	-8%
	1058	882	19%
	903	777	-12%
	1049	758	-3%
	995	762	1%
	909	774	2%
	981	813	5%
	964	884	9%
	1064	997	13%
	960	877	-12%
	1140	817	-7%
	1034	850	4%
	1122	955	12%
	853	858	-10%
	1041	916	7%
	884	829	-10%
	931	900	9%
	1066	880	-2%
	1032	989	12%
	1010	1084	10%
	1092	1087	0%
	1010	1209	11%
	1007	1328	10%
	871	1348	2%
	976	1288	-4%
	947	1435	11%
	870	1468	2%
	929	1352	-8%
Standard Deviation	73		10%

The following chart illustrates the different patterns that may occur in the two types of data series.

In the case of the fixed average, each data point is a random value around a fixed average point.

In the case of the random walk, each data point is a random value around the previous value.

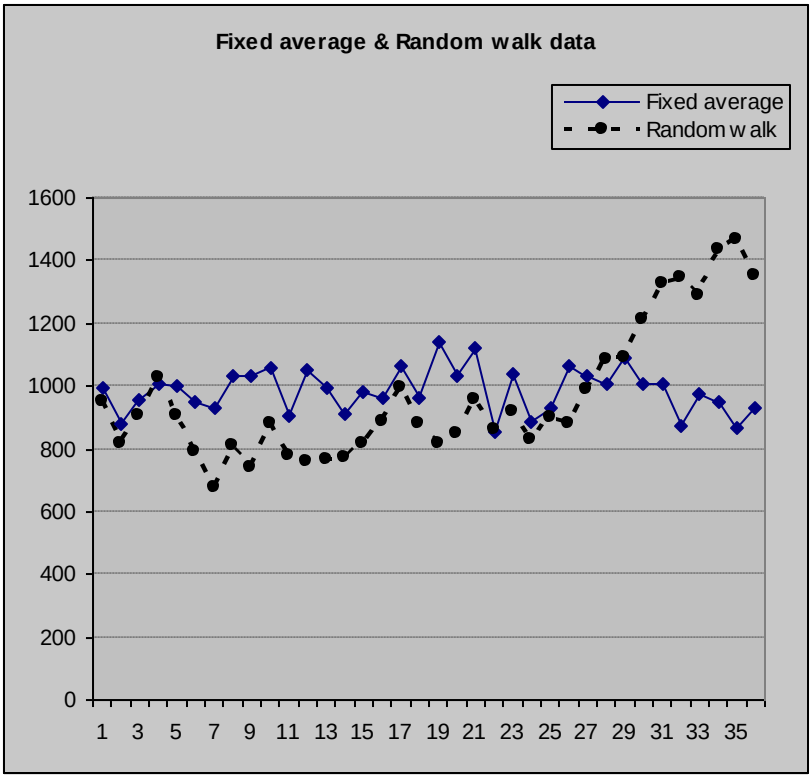


Figure 9

The price of a volatile raw material may have a current price of $100 and a standard deviation of price changes of 8% per month.

Market prices are assumed to follow a random walk pattern, so the current price is used as the reference point, and would be used as the average value in this calculation.

A probability that the price will rise above $110 at the end of the next month could be calculated using the following example.

$$\text{size of change} = \frac{\text{new value} - \text{old value}}{\text{old value}}$$

$$= \frac{110 - 100}{100}$$

$$= 0.1$$

$$= 10\ \%$$

$$\text{number of standard deviations} = \frac{\text{size of the change}}{\text{standard deviation}}$$

$$= \frac{10\ \%}{8\ \%}$$

$$= 1.25$$

This indicates that the limit price is 1.25 standard deviations above the current price.

Referring to the table in Figure 8 on page 674, this suggests that there is an approximately 10.6% chance that the price of the raw material would rise above $110 by the end of the next month.

Taking the opposite approach, the probability may be selected, and a value may be determined based on a probability.

In the case of a fixed average, the following formulas may be used to estimate a data point.

$$\text{upper value} = \text{average} + \text{number of standard deviations} \times \text{standard deviation}$$

$$\text{lower value} = \text{average} - \text{number of standard deviations} \times \text{standard deviation}$$

In the case of a random walk, where the standard deviation refers to percentage changes, the following formulas may be used.

$$\text{upper value} = \text{current value} \times (1 + \text{number of standard deviations} \times \text{standard deviation}$$

$$\text{lower value} = \text{current value} \times (1 - \text{number of standard deviations} \times \text{standard deviation}$$

As an example, a 1% probability level may be selected to estimate the price change that may occur for a market price in an extreme price move.

Referring to the previous table, this probability corresponds to a data point of approximately 2.2 standard deviations.

Assuming a current value of $95 and a standard deviation of 5% per month, the price that may occur in 1% of months could be estimated using the following example.

$$\text{upper value} = 95 \times (1 + 2.2 \times 0.05)$$

$$= \$105$$

$$\text{lower value} = 95 \times (1 - 2.2 \times 0.05)$$

$$= \$85$$

This example illustrates that an extreme price move, which may occur in 1% of cases, may result in the market price of $95 rising to $105 or falling to $85.

Calculations based on the normal distribution can be performed using computer software such as spreadsheet programs.

5.2.2.12. Volatility

5.2.2.12.1. Time series volatility

In cases such as cash flows, the standard deviation of the actual numbers could be used to determine the volatility of the variable.

This approach can be taken in any case where the average value is expected to be constant through the data set.

In the case of market prices, the standard deviation of the percentage changes is normally used, rather than the standard deviation of the actual prices.

While the percentage changes of a market price may be randomly distributed, the price itself may drift higher or lower, rather than remaining centred around a stable level.

For example, the following data shows a set of monthly prices for a 12-month period.

Price	Change
100	
93	-7%
98	5%
101	3%
108	7%
106	-2%
109	3%
91	-17%
102	13%
95	-7%

standard deviation	9%

The standard deviation of the percentage changes in this example if 9%.

This standard deviation could be applied to the previous table of probabilities, to determine the chance of a certain percentage move from the current price.

For example, a percentage move of 18% would represents 2 standard deviations compared to the standard deviation of 9%.

Based on the table in Figure 8 on page 674, there would be a 2.3% chance of the price rising by more than 18% over the coming month, and a 2.3% chance of the price falling by more than 18%.

5.2.2.12.2. Volatility over time

The volatility of a time series over long or short time periods can be calculated using the following formula.

$$\text{standard deviation} = \text{standard deviation per period} \times \sqrt{\text{number of periods}}$$

For example, in the previous example, the standard deviation of the monthly returns was 9%.

This could be converted into a standard deviation of annual returns using the following example.

$$\text{standard deviation} = 9 \times \sqrt{12}$$

$$= 9 \times 3.46$$

$$= 31\ \%$$

In this example, the volatility of the monthly returns would be 9%, and the volatility of the annual returns would be 31%.

The chance of a certain percentage change over a year could be calculated using the previous examples, using the rate of 31% as the standard deviation.

This is less than 12 times the monthly volatility, as individual months may rise or fall, and may partly cancel each other out.

5.2.2.12.3. Volatility over multiple events

5.2.3. Time-based events

In the case of time-based events, such as the chance of an event occurring within a certain period of time, the probability of the event occurring is related to a specific period of time.

For example, the probability of a building being destroyed by fire may be 2% in any 1-year period.

The probability of the building being burned within a 2 year period is not 4%.

The possibility of a fire in either the first or second years are independent events, and the probability of either event happening cannot be determined be simply adding the probabilities (**details)

In the case of time-based events, the probability of an event occurring within multiple periods of time can be determined by calculating the opposite event.

In other words, this can be determined by calculating the probability that the building will not be burned in either the first year, and also that it will not be burned in the second year, and subtracting this probability from one.

This leads to the following formula for time-based probabilities.

$$probability = 1 - (1 - single\_period\_probability)^{number\ of\ periods}$$

For example, the probability of the building being destroyed by fire within the next five years can be calculated using the following example.

$$\text{probability} = 1 - (1 - 0.02)^5$$

$$= 9.6\%$$

This can be illustrated in the following chart, which displays the probability of the building being burned within the specified time period.

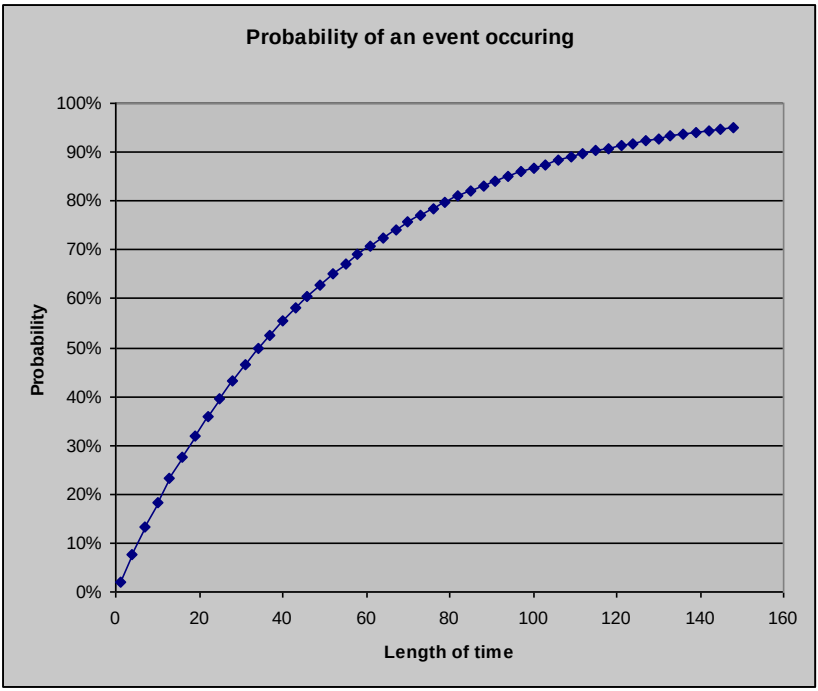


Figure 10

5.2.4. Portfolios

In some business situations, several events are combined into a single set of values.

In these cases, the standard deviation of the total amount may be less than the standard deviation of the individual items.

This occurs because the individual items may rise and fall at different times, which may partially cancel the net change, and lead to a less volatile value for the total amount.

In the case of events that may or many not occur, when a large number of risks are combined into a single portfolio, the chance of every single event occurring may be very low.

This effect is known as “diversification”, and is a major method of reducing risks in business and investment situations.

For example, this approach is used in investment management by combining several investments into a single portfolio, and this approach is also the basis of insurance, where a large number of policies are combined into a single pool of funds.

As an example of this effect, the following graph shows the reduction in volatility that may occur when a single amount is split into several independent smaller amounts.

This example is based on independent events, where each event has an equal volatility, and the items are also equally weighted within the total.

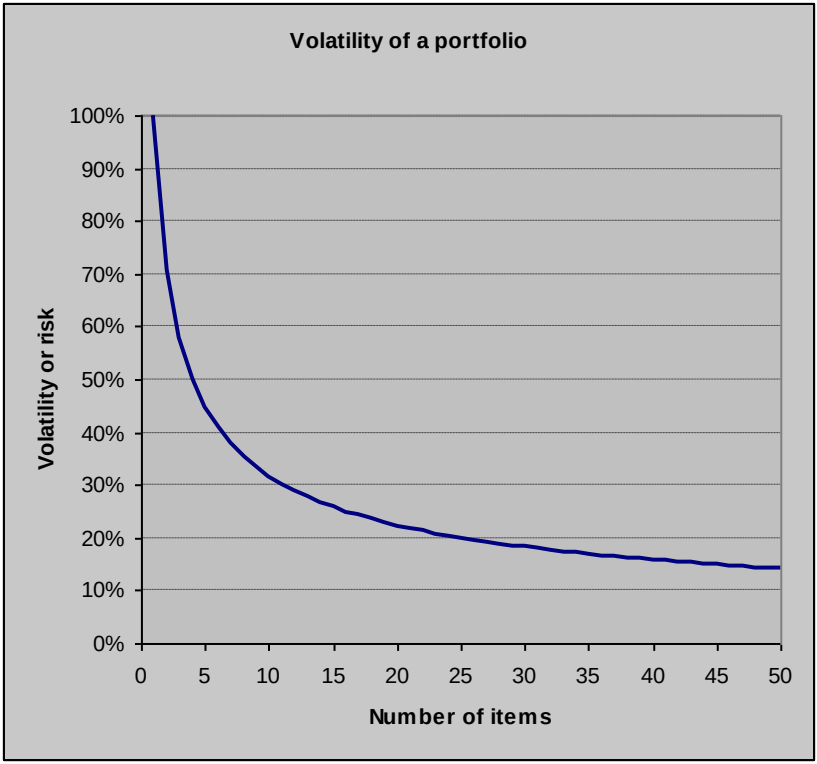


Figure 11

This example assumes the following conditions for each risk within the portfolio.

- The risks are independent, so that the correlation between any two risks is zero.
- Each risk has the same volatility as the other risks.
- Each risk has the same weight within the portfolio.

As an example of diversification, when these three conditions are met, the portfolio volatility can be calculated using the following formula.

$$\text{standard deviation} = \frac{\text{standard devaiation of an individual risk}}{\sqrt{\text{number of risks}}}$$

In cases where the events are independent, the correlation will between each event may be zero, and the volatility of the total falls toward zero when the number of individual items is large.

When the items have a high correlation and move in a similar pattern, there may be little diversification effect, and the volatility of the total amount may only reduce slightly.

The standard deviation of a portfolio of items can be calculated using a formula in the section beginning on page 1106.

5.2.5. Statistical estimation

A number of practical issues may arise with applying statistical analysis to a set of figures.

In some cases, although a figure can be mathematically calculated, the accuracy or practical relevance of the figure may be limited.

For example, although a standard deviation could be calculated from three annual figures, the fact that only three figures were included in the sample may result in the actual number having limited use in forecasting future values.

5.2.5.1. Stationary series

Problems may arise when the underlying causes that produce a set of numbers changes over time.

For example, if the structure or operation of a business changes over time, then any figures that relate to previous periods may not be relevant to calculating probabilities of future events occurring.

In the case of data such as market prices, if the underlying volatility changes significantly during the period of the sample, then a volatility calculation over the full period may not produce a useful estimate of the likely future volatility.

5.2.5.2. Outliers

An "outlier" is a data value that is much higher or much lower than the rest of the data sample.

This may be due to an error such as a typing mistake, or it may simply be an unusual value that occurred purely by chance.

Outliers may cause a large change in figures such as averages and standard deviations.

Standard deviation may be particularly affected by outliers, as the calculation is based on the individual differences being squared.

A single unusual value within several hundred data points can result in a noticeable difference in a standard deviation figure.

It is common within statistical analysis to remove outliers from the data sample before calculating statistical results.

This may enable a more accurate reflection of the underlying effects to be determined, and this approach may be particularly useful with the results are used for modelling transactions such as project cash flows, and when the results are used for forecasting.

However, this would not generally apply in the case that the figures were calculated for the purpose of reporting actual results, rather than for modelling or forecasting purposes.

5.2.5.3. Spurious correlations

Correlation figures may sometimes suggest that a relationship exists between two sets of numbers, when in fact this is not the case.

Correlations can arise when they do not exist within the underlying cause of the data in some of the following circumstances.

Independent third factors	Both data series may be related to a third factor, even through there may be no cause-and-effect relationship between the two data series. For example, the sales figures of sun tan cream and sun hats may be correlated, even though one data series did not cause the other.
Random chance	A correlation may appear between two sets of random numbers by pure chance.
Choice of sample	The choice of which data to include in the sample, and how the data should be defined, may create a correlation when in fact no correlation actually exists within the underlying system.
Directional effects	Where a correlation exists between two sets of numbers and a cause-and-effect relationship is the cause of the correlation, the correlation does not specify which data set is the cause and which data set is the result. This can only be determined by making an assumption as to which data set is causing the other data set, and in some cases an apparently obvious link may in fact be occurring in reverse.

5.2.5.4. Altering inputs

Regressions and correlations can only be performed with data series that contain a range of different values.

For example, in the earlier case of the advertising expenses, the relationship between the changing advertising expense and the changing sales figures allowed a regression calculation to be performed.

If the advertising expense had been a constant figure in each period, it would not have been possible to determine whether the advertising was affecting the sales figures or not.

In some cases, a variable can be deliberately changed in order to determine a cause-and-effect.

For example, the advertising may be operated for several months, halted for a period of time, and then re-started.

This may provide an opportunity to determine whether the sales figures rose of fell in relation to the advertising, or whether the advertising had no significant effect.

This is one approach that may be used to determine the effectiveness of a regular advertising campaign, although care should be taken to ensure that any profile that has been established by the business does not decay to the point where it cannot be resurrected.

In general a change in operations may not be made purely for the purpose of determining the effect that it may have on other issues.

However, the fact remains that the effect of one variable cannot be truly determined unless it is changed or removed.

When this is done, the original influence of the variable may be reflected in the change that occurs following a change in the variable.

5.2.6. Applications of probability and statistics

Statistics can be used within business situations in some of the following contexts.

Financial structure	Average levels and variations in sales, cash flows, asset values and so on.
Financial risk	Exposure of the business to potential loss due to volatile prices, interest rate changes, foreign exchange rate changes and so on.
Manufacturing	Product tolerances, fault rates, etc.
Marketing	Average response rates to advertising, trial product launches, the spread of customer numbers between low-volume, medium-volume and high-volume service usage and so on.

Statistics may be heavily used in manufacturing.

For example, food items are often sold by weight.

Samples of the completed products may be selected and weighed, to ensure that the average weight of the products matched the weight that was specified in the product description.

As another example, manufactured steel parts may be produced to specified tolerances.

For example, a part may have a specified weight of 1200 ± 4 grams.

The actual weight of individual items may follow a pattern that approximately matched a normal probability distribution.

Parts that were outside the specified tolerances may be discarded, with the measuring accuracy of the measuring equipment also being relevant in selecting the relevant set of parts.

5.2.7. Other statistical issues

5.2.7.1. Combinations & permutations

In some situations, the number of combinations of a set of variables may need to be determined.

The following formulas can be used to calculate the number of combinations of items that may occur in several different situations

Combinations

When several items are selected from a larger set of items, the number of possible combinations can be calculated from the following formula

(** combinations)

In this formula, “n” is the number of items that are selected, and “k” is the total number of items.

In this calculation, the order of the items is not significant, and a group of items is counted as a single combination, regardless of the order in which they are drawn.

Permutations

A similar calculation to the combinations value can be calculated when the order of the items is significant.

In this case, a group of the same items is classified as a separate set when the items appear in a different order.

The following formula can be used to calculate the number of permutations of "n" items selected from a set of "k" items

(** permutations)

Multiple variables

In some cases, such as product options, several variables may apply, with each variable containing a number of possible values.

In these cases, the total number of combinations of the variables can be calculated using the following approach.

$$\text{combinations} = \text{number of items for each variable, multiplied together}$$

For example, if a product contained three options, with the first option having 3 alternatives, the second option having 7, and the third option 4, then the total number of possible product combinations could be calculated using the following approach.

$$\text{combinations} = 3 \times 7 \times 4$$

$$= 84$$

5.2.8. Statistical terms

Arithmetic average	A central point in the set of numbers, calculated by dividing the sum of the numbers by the number of data points. This could also be expressed in the form that total value of the data series is equal to the arithmetic average multiplied by the number of data points. In statistics this value is generally known as the "mean".
Average	A central point within the set of numbers. The term "average" generally refers to the "arithmetic average".
Bivariate	Applying to two data variables.
Coefficient	A number in an equation that is multiplied by a variable. For example, in the equation "sales = 1.2 x advertising", the value "1.2" is a coefficient.
Confidence interval	A range based on a minimum and maximum value for a statistical number such as an average, which attempts to measure how accurate the number is likely to be. The width of the confidence internal reduces as the number of data points increases, and increases as the specified required accuracy is increased.
Correlation	A value that indicates the linear relationship between two data sets. A correlation of 0 suggests that the data sets are independent, and that a value is one data set does not affect a value in the other data set. Correlation varies between -1, for a perfect opposite relationship, to +1, for a perfect positive relationship.
Covariance	A measure of the relationship between two data sets, that includes the standard deviation of each data set. The covariance is equal to the "correlation x standard deviation of set 1 x standard deviation of set 2".
Estimation	Calculating a statistical value such as an average. In cases where the numbers may represent part of a larger set of values, the value that is calculated is only an estimate of the value that may apply to the full set of numbers. For example, the volatility within a market price can

	be calculated from a set of prices, however this may not exactly reflect the actual volatility that is causing the price changes.
Expectation	The mean of a random variable. Also known as the "expected value", although in some cases the mean is not equal to the value of any of the possible outcomes.
Geometric average	The "nth" root of the product of "n" numbers. When the geometric average is multiplied by itself, it equals the total of the data set, in contrast to the arithmetic average, which must be added to itself. The geometric average is used for data sets that are multiplied together, such as investment returns.
Kurtosis	The fourth moment of a distribution, this is calculated from averaging the values of the deviation of each data point from the mean, raised to the power of 4. Kurtosis specifies how large the "tails" of a distribution are, and whether extreme events are more likely or less likely than in alternative distributions. Leptokurtosis indicates that extreme events have a higher chance of occurring than a standard distribution would suggest. This is a common effect in some financial markets.
Linear distribution	A distribution in which the probability of each possible outcome is equal, such as tossing a coin.
Mean	See "arithmetic average".
Median	A point such that half the data set is less than the median, and half the data set is larger than the median. This is an alternative measure of a central point to the arithmetic average, and may be useful when a small number of data points are available, or when the data contains a large number of outliers or errors.
Mode	A data value that occurs the most number of times within a large set of numbers. This statistical figure is rarely used.
Moment	A property of a probability distribution or a set of numbers, calculated by averaging the deviations from the mean, raised to the specified power. The mean is the first moment of a distribution, variance is the second moment, skewness is the third moment and kurtosis is the

	fourth moment.
Multivariate	Applying to two or more data variables.
Normal distribution	A distribution that commonly appears in variables that are based on a large number of separate effects. Values within one standard deviation of the mean are common, while extreme positive or negative numbers have very low probabilities.
Outcome	A possible result from a trial, such as the number 3 appearing on a dice, or a sale in response to a sample of products.
Outlier	A data point that is much larger or smaller than most of the other data points. This may be an error, or simply an unusual occurrence. Outliers may have a significant impact on values such as standard deviation, and are sometimes removed before statistical values are calculated.
Poisson distribution	A probability distribution that specifies the number of random events that are likely to occur within a period of time, such as the number of customers arriving at a business location within a period of time.
Probability	The chance that an event will occur. Although probability cannot predict events, an event that has a probability of 0.5 would be excepted to occur about half the time, if a large number of trials were conducted. Probability ranges between 0, for an event that cannot occur, and 1, for an event that is certain to occur.
Probability distribution	A pattern of the probabilities that apply to each possible outcome. The “normal distribution” is the most widely-occurring distribution in the business and finance context.
Product	The result of multiplying several numbers together. For example, the product of “a”, “b” and “c” is equal to $a \times b \times c$.
Random variable	A value that can have random values that cannot be determined from previous values. Examples may include the sales figures for a month, and the price of a volatile commodity.
Random walk	A time series in which a probability distribution of each value is centred on the previous point in the series, rather than a constant value. The price of goods within markets often follows a random walk pattern.

Regression	A calculation that estimates a cause-and-effect relationship between two data sets. This allows a prediction to be made of a likely value in one data set, given a specified value in the other data set.
Risk	In the business context, a situation in which an event may occur that would have a negative impact on the business. In the financial context, this is exposure to the possibility of a positive or negative change in value, such as exposure to a volatile price, or an uncertain cash flow.
R-squared	The square of a regression co-efficient, which is the regression coefficient that is multiplied by the first data value. The r-squared indicates the proportion of the second data set that may be caused by moves in the first data set.
Sample	A set of numbers that is used to calculate statistical values, as an estimate of the values that may apply to the full set of items. For example, a sample of manufactured items may be weighed to estimate the weight of the average product in a large set of products.
Sample Bias	A situation in which a set of statistical results that have been calculated from a sample do not reflect the parameters that exist within the full data set, due to the method that was used to select the sample data items.
Seasonal adjustment	Adjustment to time series in attempts to remove the effect of seasonal changes, so that a trend rise or fall in the data values can be determined. Seasonally adjusted figured are widely used in economic data.
Skew	The third moment of a distribution, calculated as the average of the cubed distances of each data point from the mean. A symmetrical distribution has a skew of zero. A negative skew indicates that the left side of the distribution has a high proportion of extreme values, while a positive skew indicated that the right side of the distribution has a high proportion of extreme values.
Stationary	A time series in which the underlying distribution does not change. For example, if a market price became more volatile for an extended period of time, this would be a non-

	stationary series.
Statistic	A number that describes a property of a set of numbers, such as an average value.
Stochastic	A process that includes random elements, and in which the outputs cannot be predicted from the inputs or from previous events. In contrast, in a deterministic process, the outputs can be directly predicted from the inputs. The operating speed of a machine is a deterministic process, while the fault rate is a stochastic process.
Sum	The result of adding several numbers together. For example, the sum of "a", "b" and "c" is equal to a + b + c.
Trial	An action that generates an outcome, such as throwing a dice, or distributing sample products within a marketing campaign.
Univariate	Applying to a single data variable.
Variance	The average of the squared deviation of each data point from the mean. This is a measure of how widely spread the data points are. Standard deviation is the square root of the variance.
Volatility	The standard deviation of a time series, such as a series of market prices.
Weight	The significance or impact of an individual number within a data series. For example, each number with a data series may specify a property of an object, with the size of each object indicating the impact of the individual number on the total value of the series.
Weighted average	An average of a set of numbers that applies a separate weight to each number in the average. The weighted average multiplied by the total of the weights is equal to the sum of each individual number multiplied by its weight.

5.3. Specific risk management

5.3.1. Specific Risks

Business risk involves the risk that events may have a negative impact on the business.

This could occur suddenly due to a single event, or it may involve the gradual deterioration of the business over time.

General business risk may be addressed through some of the following steps.

- Creating a business structure that is flexible and effective.
- Maintaining adequate levels of capital and cash reserves.
- Attending to margins and cash flow.
- Investment in new products and projects.

Specific risks involve the risk that a negative impact may occur to the business due to a specific event.

This may include changes to the market price of raw materials or finished products, changes in foreign exchange rates or interest rates, projects risks, and losses due to insurable events such as buildings being destroyed by fire.

Specific risks may involve individual events, or they may involve a continuous process such as a volatile input price.

In general, specific risks can be managed as potential cash flows, of various sizes and probabilities, depending on the particular situation.

5.3.2. Risk Exposures

5.3.2.1. Underlying Exposures

Underlying exposures involve exposures to risk that occur as part of the business operation.

For example, if either a raw material or a finished product trades with volatile prices, then the business may be exposed to the risk of a negative impact caused by rising raw materials prices, or falling prices for finished goods.

Changes in foreign exchange rates may impact negatively on the business if the business imports raw materials or equipment, or exports finished products.

The risk of increases in interest rates may also represent a risk to the business, due to the higher interest payments that may be required in this case.

In the case of projects, risks may involve an uncertain value of future costs or income due to changes in market prices, interest rates and foreign exchange rates.

Also, the risk of the project itself may be considered, such as the risk that project stages will not be completed, or that costs and time frames will deviate from the project plan when the project is implemented.

A “long” exposure is an exposure in which a fall in the price would have a negative impact on the business.

A holding of a physical asset, and the sale price of a completed product, are examples of long exposures.

A “short” exposure is an exposure in which a rise, rather than a fall, in the price would have a negative impact on the business.

The exposure of the business to the risk of rising raw materials costs is an example of a short position.

Instruments that involve two parties, such as futures, options, and fixed-price supply contracts, are a long position for one party and a short position for the other party.

5.3.2.2. Risk instruments

Risk instruments involve contracts that create a risk for the business.

The risk created by a risk instrument may increase risk to the business, or it may reduce the net risk by offsetting an existing exposure.

Direct contracts

Direct contracts involve contracts between the business and customers or suppliers.

These may include agreements to conduct transactions on future dates, with the price and contract details being established at the beginning of the period.

This is known as a forward sale.

Direct contracts may also include options and other exposures, such as a delivery price that is equal to the market price, but with a maximum and minimum price range.

These contract structures may be used to reduce the risk of rising input values or falling output values for the business.

Also, contract conditions may involve the business taking on a price risk from a customer or a supplier, in return for an altered payment under the contract terms.

Traded Instruments

Traded instruments involve contracts that can be bought and sold with other parties.

The contracts generally involve a simple structure, such as an agreement to purchase a fixed quantity of a standard commodity on a future date at a fixed price.

Traded instruments can be used to hedge existing risks, or for trading and speculative purposes.

A “hedge” involves entering a risk contract with an opposite exposure to an underlying exposure, as a method of cancelling the existing risk.

Traded futures and options contracts are available involving agricultural commodities such as wheat and wool, mining commodities such as oil and gold, foreign exchange rates, and interest rates.

5.3.3. Risk Instruments

5.3.3.1. Direct contracts

Forwards

A forward sale involves a contract to exchange goods for payment, however the actual exchange is set to occur on a distant future date.

For example, a agricultural producer may conduct a forward sale to a manufacturer, with delivery to occur in six month's time after the end of the harvest season, and with payment to be made at the same time.

A forward sale involves a price being set at the time that the initial contract is created.

The risk to the business that the market price may fall before the settlement date is eliminated by this arrangement.

A forward sale could be viewed as directly eliminating this price risk.

An alternative view may involve the underlying market risk of the commodity price remaining, with the forward contract representing a separate risk in the opposite direction, which cancels the underlying risk.

This view may be useful in determining pricing for contracts and underlying exposures, and in considering issues such as the risk of default on the forward contract.

Contract options

Contract options may involve a direct agreement with a customer or supplier to conduction an optional transaction, or to include an option involving the transaction price.

For example, a supply contract may involve an agreement to supply a commodity at the current market price, up to a maximum price limit.

This structure would effectively allow the buyer to choose the current market price, or the fixed option price, whichever was lower.

Options may be used by the option holder to reduce the exposure to certain price moves.

The value of the option may be included within the contract, using methods such as an additional fee, a higher average price, a margin added to the market price or some other mechanism.

Complex arrangements

Supply contracts may also involve more complex risk structures, such as price ranges, transaction that occur under different conditions, and so on.

In these cases, the value of the risk condition is equal to the average transfer of value that would occur, considering the probabilities of various prices and events occurring.

Methods such as computer simulations may be necessary to determine a value for these contracts.

In some cases, the value of a contract may be estimated from current conditions, rather than from a statistical analysis.

5.3.3.2. Traded instruments

Traded instruments involve standardised contracts that are traded on stock and futures exchanges.

These contracts may be used for risk management and for speculative purposes.

Similar contracts may also be arranged directly with other parties in some circumstances, which are known as “over-the-counter” instruments

5.3.3.2.1. Types of traded instrument

5.3.3.2.1.1. Options

A traded option is a generally a contract than includes the right to buy or to sell a fixed quantity of a commodity for a fixed period of time, at a fixed price.

A “call” option involves the right to buy a commodity, while a “put” option involves the right to sell a commodity.

The option buyer may chose to exercise the option, in which case the specified transaction proceeds.

If the option holder takes no action, the option lapses, and no transaction occurs.

The party that creates the option is known as the option writer, and must conduct the transaction if the option holder exercises the option.

The “strike price” of an option is the fixed price at which the underlying transaction would occur if the option was exercised.

An “American style” option can be exercised at any time within the option period, while a “European style” option can only be exercised on the final day of the option period.

These terms do not refer to geographical locations, and both styles of option are traded in various places and circumstances.

The term of an option is generally in the range of several months.

Options can be a flexible and useful risk management tool, as they allow the price exposure of the business to be altered to match a range of different patterns.

In contrast, fixed price agreements simply allow the total risk to be raised or lowered, rather than altering the pattern of exposure that may occur at different price levels.

As an example of interest rate risk, a payment of $100 may be expected in six month’s time.

At that time, the payment may be invested in government bonds.

A call option could be purchased to allow the purchase of $100 of government bonds in six month's time, at a current interest rate of 8%.

This option may allow the business to hedge the risk that interest rates may fall before the payment is received.

Options may be used to manage price risk.

Also, options can be used in situations in which a transaction may or may not occur.

For example, a business may submit a fixed-price tender for a project.

An option could then be purchased, to allow the raw materials to be purchased at a fixed price if the tender was selected to complete the project.

As an example of an option, the following table lists a set of possible results at the expiry date for a call option with a strike price of $100.

Market Price	Delivery Price	Deliverer's Value Change	Receiver's Value Change
85	85	0	0
90	90	0	0
95	95	0	0
100	100	0	0
105	100	-5	+5
110	100	-10	+10
115	100	-15	+15

5.3.3.2.1.2. Futures

A futures contract is a standardised forward sale contract that is traded on a futures exchange.

A futures contract involves entering a contract to buy or sell a fixed quantity of a commodity at a fixed price on a future date.

No cost is involved in entering a futures transaction.

There generally is an equal probability of a profit or a loss occurring on a futures position, and there is no transfer of risk from one party to the other.

A futures contract can be used to take on a risk of the opposite direction to an underlying risk, and so to cancel the underlying risk.

For example, an agricultural producer may purchase a futures contract to sell a quantity of a commodity on a future date, at a fixed price.

Once the contract is entered, changes in market prices will lead to a positive or negative value arising for the futures contract, as the futures contract may involve a sale occurring at a price that is above or below the current market price when the transaction occurs on the expiry date of the contract.

This profit or loss would balance the opposite rise or fall in the market value of the underlying commodity held by the business.

A futures contract can be "closed out" prior to maturing, by entering a second futures contract of the opposite direction, and realising the current profit or loss on the position.

A "margin" involves a payment that is lodged with a broker to match a current loss position.

Margins on futures contracts must be updated daily, and are used to reduce the credit risk of a client defaulting on a futures contract.

The following table presents an example of some possible results on the expiry date of a futures contract.

The futures contract price in this example is $100.

Market Price	Delivery Price	Deliverer's Value Change	Receiver's Value Change
85	100	+15	-15
90	100	+10	-10
95	100	+5	-5
100	100	0	0
105	100	-5	+5
110	100	-10	+10
115	100	-15	+15

5.3.3.2.1.3. Swaps

A “swap” is an instrument that involves exchanging a series of interest payments at a fixed interest rate, for a series of interest payments at a floating interest rate.

The net different between the fixed interest rate payment and the floating interest payment is exchanged on each interest payment date.

A swap can be used to change the business’s debt from a fixed interest rate structure to a floating interest rate structure, without altering the loans themselves.

5.3.3.2.2. Exchange traded instruments

Exchange traded instruments are standardised options, futures and other instruments that are traded on stock or futures exchanges.

This approach allows positions to be opened and closed at any time, assuming that there is a reasonable level of trading volume occurring in the instrument.

A number of methods are used to conduct trading on exchanges.

Bid-and-offer exchanges

The bid-and-offer system involves buyers lodging bids and sellers lodging offers to sell.

Each bid or offer specifies a price and a quantity of the commodity to buy or sell.

There is generally a small gap between the highest bid and the lowest offer, known as a “bid-offer spread” or the “bid-ask spread”.

A transaction occurs when one party accepts a current bid or offer of another party.

Bid-and-offer systems are commonly used for stock exchanges

Open outcry exchanges

In an open outcry system, trading takes place within a large room.

A client order is announced in a small area known as a trading pit.

Other brokers call out offers, and after a short period of negotiation, a deal price is struck and the next order is announced.

Open outcry systems are commonly used in commodity exchanges, and also in futures exchanges.

Dealer markets

In dealer markets, full-time dealers within the market are allocated a set of instruments.

The dealer then quotes a buy and a sell price when an investor approaches the market to trade.

This may involve offering to create options or to buy options.

In the case of securities, the dealer may hold a portfolio of securities to allow securities to be sold to an investor when an investor requests a quote for a selling price.

This system may be combined with bids and offers that are lodged directly in the market by buyers and sellers.

Dealer markets are used in situations were a low volume of trading may occur, such as stock exchanges that specialise in trading the shares of small companies.

5.3.3.2.3. Over-the-counter instruments

An over-the-counter instrument involves forward transactions, options and other instruments that are directly arranged with a counterparty, generally a bank.

For example, a business may be expecting to make a large foreign exchange payment on a certain date in the future.

A forward transaction could then be arranged with a bank, to fix the exchange rate at the current level, and to reduce the risk of a loss occurring due to a change in the foreign exchange rate.

Over-the-counter instruments can be customised to the requirements of a particular transaction.

However, an over-the-counter contract may be more difficult to arrange than an exchange-traded contract, as the counterparty may be exposed to the credit risk of the business.

Also, closing an over-the-counter position may involve obtaining a quote from the counterparty to unwind the contract.

In some markets, a "two way price" is quoted.

This involves the client nominating a transaction, and the counterparty quoting both a buy and a sell price for the transaction.

For example, a bank may quote a price of $76 to sell an option to a client and $75 to buy the option from the client.

A two-way quote allows the business to determine the fee spread that is embedded within the quote, before deciding whether to proceed with the transaction.

5.3.4. Pricing a risk

Pricing a risk involves calculating a value for an exposure or an instrument such as an option.

The effective value of an uncertain cash flow is equal to the average transfer than would occur, considering the probabilities of the situation.

This principle applies to all risks and uncertain cash flows, no matter how complex the instrument or the situation.

This principle also applies to uncertain asset values, as well as uncertain cash flows.

Options

The value of an option is dependant on probabilities.

A traded option cannot have a negative or zero value, as no loss can occur for a holder of an option, however a profit could occur in certain circumstances.

Futures

The value of a futures contract is zero at commencement.

The futures price stabilises at a level where the market consensus view forecasts an equal probability of the market price of the commodity being above or below the futures price at the expiry of the contract.

Probabilities are not involved in valuing a futures or a forward position, at it is assumed that the probabilities are incorporated within the current futures price.

The futures price at commencement is generally close to the current market price of the commodity.

After the commencement of the contract, the value of a futures position is based on the difference between the contract price and the current futures price, which is generally close to the market price.

Other instruments

The value of other risk instruments, in addition to futures and options, is also equal to the average value transfer that would occur, considering the probabilities of the possible price moves.

A number of methods may be used to estimate the value of a risk exposure or a risk instrument.

This may include some of the following methods.

5.3.4.1. Analytical methods

Analytical methods involve calculations using mathematical equations.

This may include the following approaches for specific risk circumstances.

Single cash flow

In the case of a single cash flow that may or may not occur, the effective value of the cash flow can be calculated using the following formula.

$$\text{value} = \text{probability} \times \text{amount}$$

This equation specifies a fundamental relationship, and appears in many areas of business and finance.

For example, an item of equipment may be insured for $50 with the probability of loss or destruction of the equipment being 0.03.

In this case, the value of the policy could be calculated using the following example.

$$\text{value} = 0.03 \times 50$$

$$= \$1.50$$

Variable cash flow size

In the case where a cash flow or an asset value could have several possible values, the following formula may be used to calculate the effective value.

$$\text{value} = \text{sum of "probability} \times \text{amount "for each possible value}$$

This is the weighted average of the possible values, with the probability of each value occurring being used as the weight.

For example, the following figures may be estimated for a new product launch

Value	Probability
40	20%
60	70%
80	10%

The value of the product could then be estimated using the following calculation.

$$\text{value} = 40 \times 0.2 + 60 \times 0.7 + 80 \times 0.1$$

$$= \$58$$

The previous example of the equipment insurance payment could also be viewed as a set of possible outcomes.

For example, the following outcomes may be possible

Outcome	Cash Flow	Probability
Loss or destruction	50	0.03
No loss	0	0.97

In this case, the value of the insurance payment could be calculated using the following example.

$$\text{average value} = 50 \times 0.03 + 0 \times 0.97$$

$$= \$1.50$$

The formula for a single event that may or may not occur is a simplified case of the general formula of weighted averages, and applies when a single fixed value may or may not occur.

Variable cash flow with continuous values

In the case of values based on continuous variables, such as market prices, there may be a potentially unlimited number of possible values for a cash flow.

In this case, the effective value of the cash flow remains equal to the sum of each value multiplied by the probability of the value occurring, however calculation may be more difficult than with a finite number of possible values.

In some cases, a model based on a probability distribution may be used.

Also, models based on dividing the prices into a large number of separate values, or using simulation approaches, may be used to estimate a value for the risk.

Option pricing

A mathematical equation known as the Black & Scholes option pricing model can be used to calculate the value of standard options contracts.

This model is based on the probabilities of the normal probability distribution.

The Black & Scholes model can be used in any circumstances where the volatility of the underlying commodity price can be estimated.

This calculation is presented in section beginning on page 1105.

5.3.4.2. Modelling

Modelling approaches involve using a computer model to calculate a value for the exposure.

This can be done using standard software such as spreadsheet programs, or through writing programs specifically to perform the calculations involved in valuing the instrument.

One approach may involve dividing the possible final prices into a large number of small bands, and calculating the value of the position within each band.

The value of the exposure would then be equal to value transfer in each band, multiplied by the probability of the price appearing in the band, and totalled across all the price bands.

The probability could be estimated from the normal distribution, based on the number of standard deviations of the price move from the current price to the price at the start and the end of each band.

Modelling approaches can be used in cases where there are a small number of input variables

5.3.4.3. Simulation

Simulation approaches involve producing a set of possible output results, and calculating a value for the exposure from the average value of the results.

An “historical simulation” involves using past prices as inputs to the simulation calculation.

A “Monte Carlo” simulation involves generating a large number of random input prices, in a similar probability distribution to the expected input prices.

Simulation approaches can be used to value complex instruments, in cases where there are a large number of input variables, and for path-dependant positions, where the value may depend of the path that was followed by the input prices, as well as the final values.

Simulation approaches are often used in valuing projects.

For example, a mining project valuation may be based on generating random values for the market prices of the commodities, supply costs such as fuel costs, and the amount of the mineral found within the mined ore.

In other cases, a set of fixed assumptions may be used, or a set of best-case, worst-case and average-case figures may be used to determine a set of scenarios and to calculate a range of valuations.

5.3.4.4. Summary of risk pricing approaches

Analytical calculations	Weighted average of the possible outcomes. The Black & Scholes option pricing model.
Modelling	Computer-based models of the instrument value, such as dividing price levels into bands and calculating the value in each band.
Simulation	Historical simulation, based of results of valuations using past prices as inputs. Monte Carlo simulation, using random prices as inputs to generate a probability distribution and average output figure.

5.3.5. Capital calculations

In cases where risk instruments are held, capital must generally be set aside to meet the possible payments that may be required.

This includes positions such as futures positions, where losses may occur, and written options, where the business may be required to conduct a transaction if the option is exercised.

5.3.5.1. Maximum losses

In some cases, the maximum loss that could occur can be calculated.

For example, the maximum loss that could occur on a physical holding of an asset or a commodity would occur if the market value fell to zero.

In other cases, the potential loss may be unlimited.

For example, the exposure to a raw material price is potential unlimited, as a price can only fall to zero, however the input price of a raw material could, in theory, rise to an infinite price.

In cases where a potential loss is unlimited, an extreme price move, such as a doubling of the price within a short period of time, could be used for a maximum loss calculation.

The maximum loss on a position can be calculated using the following approach.

$$\text{maximum loss} = \text{current value} - \text{value at worstcase market price}$$

The total potential loss may be determined by calculating the maximum loss of each instrument, and summing the total.

Maximum losses and current values

The maximum loss that can occur with a physical asset is equal to the total value of the asset.

In the case of company structures, the maximum loss is also equal to the value of the share price.

However, in the case of positions such as short futures positions and written options positions, the maximum loss may be significantly larger that the current value of the position.

In the case of business activities conducted in an individual name or as a partnership, the maximum loss may also be larger than the amount invested.

Practical losses

In many cases the maximum loss may be larger than the practical loss that may be likely to occur.

For example, the market price of a commodity may be unlikely to fall to zero.

However, a market price may drop significantly, and in the case of assets such as shares, a zero value may be a realistic possibility.

When many independent risks are held, such as bank loans and insurance policies, the probability of all risks entering loss-making positions at the same time may be small.

However, the maximum risk exposure may highlight the relative importance of risk management calculations and approaches within the management of the business.

5.3.5.2. Funding approaches

5.3.5.2.1. Full funding

In cases where a small number of payments may be required, the full value of the payments may be set aside to meet the possibility of payments becoming due.

5.3.5.2.2. Partial funding

In cases where a large number of independent risks are held, or the chance of a complete loss may be low, and only part of the maximum possible loss may be set aside to meet possible payments.

The level of capital may be based on experience, the trading history of the operation, and current market conditions.

Statistical approaches may also be used in determining capital levels.

Two major approaches are the value-at-risk method, and the delta-weighting method.

5.3.5.3. Calculating capital levels

5.3.5.3.1. Value at risk

A value-at-risk approach involves assuming a certain price movement, and determining the loss that would occur at that price movement.

The loss figure may then be used to determine the level of capital that may be set aside.

For example, a 1% probability level may be chosen.

Based on the normal probability distribution, and referring to table in Figure 8 on page 674, there is approximately a 1% probability of a price movement of more than 2.2 standard deviations occurring over the time frame of the standard deviation calculation.

This figure could be used to determine a new price as an input to a valuation model, to determine the loss that may occur under an extreme price move.

Alternatively, an extreme percentage movement based on a market crash may be used, such as a 35% drop in the current price of a commodity or asset.

Simulation approaches can also be used to determine value-at-risk.

Under these approaches, a probability distribution of the profit or loss may be determined, with the maximum loss up to a certain probability level being calculated.

5.3.5.3.2. Delta weighting.

Delta weighting involves calculating a figure known as the “delta” for each instrument.

The delta of an instrument is the instrument’s sensitivity to the price movements of the underlying commodity.

A delta can be calculated using the following approach

$$\text{delta} = \frac{\text{the change in the output price}}{\text{a small change in the input price}}$$

Delta is based on a dollar change, not a percentage change.

For example, an instrument may have a delta of 0.5.

In the case that a price of the underlying exposure moved by $4, for example, then the price of the instrument may change by $2.

The maximum loss is then calculated from the delta, multiplied by the change in the input price.

The input price could be determined from a certain percentage change, assuming a condition such as a market crash, or from the normal probability distribution, assuming a change such as a 2.5 standard deviation rise or fall.

However, the delta-weighting method should be used with caution.

This method is only strictly accurate when the delta is a constant value.

Delta is a constant value for futures and shares, but not for options, and not for many other instruments.

In cases where the delta itself varies with the price level, this method may be useful in managing general trading activity, however it may not provide an accurate estimate of the effective risk exposure or an instrument or a portfolio.

For example, the following table presents a set of figures for a range of possible losses on an option position.

These figures include the predicted loss using the delta-weighted method, and also using the actual loss that would have occurred.

Market Price	115
Option Price	100
Delta	0.2

Price	Predicted Loss	Actual Loss
115	0	0
110	1	0
105	2	0
100	3	0
95	4	5
90	5	10
85	6	15
80	7	20
75	8	25
70	9	30
65	10	35
60	11	40

5.3.6. Risk portfolios

A risk portfolio involves a combination of several separate exposures.

These could include loans held by banks, risks held by insurance companies, and traded instruments held within hedging portfolios.

Independent risks involve risks in which the probability of a change in the value of one risk is not affected by a change on the value of another risk.

For example, this may broadly apply to risks such as debt defaults, insurance payments, and instruments traded in widely different markets.

However, it may not apply to instruments that are traded in the same market and may tend to rise or fall in parallel.

In a portfolio composed of independent risks, the volatility of the total portfolio may reduce in line with the square root of the number of risks within the portfolio.

The following table presents the volatility of a portfolio of independent risks, where each risk has the same standard deviation and the same weight within the portfolio.

Number of risks	Volatility
1	100%
2	71%
3	58%
4	50%
5	45%
10	32%
50	14%
100	10%
1000	3%

For example, a portfolio of three risks in this case may have a volatility of only 58% of the volatility of an individual risk.

This occurs due to the fact that some risks may rise while others may fall, which may tend to cancel out the net move, and lead to a lower volatility for the total portfolio value.

The expected standard deviation of a portfolio can be calculated from the standard deviations of the individual risks, where these figures can be estimated.

The formula for calculating the standard deviation of a portfolio of risks is presented in section beginning on page 1106.

5.3.7. Exposure positions

5.3.7.1. Combined positions

In some cases, a risk position may be more complex than a standard option or forward sale.

For example, one exposure position used in hedging is known as a “collar”.

A collar involves a trade occurring at a market price, but with a minimum and maximum price value.

As an example, a supply contract may specify that the products will be supplied at the current market price, but with a minimum price of $8 and a maximum price of $11.

Combined positions may exist within direct contracts between suppliers and customers, or they can be created by holding several separate instruments.

For example, the collar in the previous example could be created by buying a call option with a strike price of $11, and writing a put option with a strike price of $8.

If the market price fell within the range of $8 to $11, a standard purchase at the market price could be conducted.

If the price at the end of the period was above $11, then the call option could be exercised to enable the purchase to be made at the $11 price.

Alternatively, if the market price at the end of the period was below $8, the put option may be exercised against the business, and delivery would be accepted at the $8 price.

Combined positions can be valued by valuing each individual component of the position, and adding or subtracting the values to determine the net cost of the position.

5.3.7.2. Complex positions

In some situations, more complex positions may be created, that cannot be valued using standard options valuation approaches.

For example, a contract price may be based on an average price over a period, or the minimum or maximum price that occurred during a period.

Positions such as these may be included in some traded instruments, in over-the-counter instruments, and in direct contracts.

In these cases, a simulation approach may be necessary to effectively value the exposure.

5.3.7.3. Buying & selling upside risk

An option position involves a potential benefit to the option holder, and a corresponding potential loss to the option writer.

For example, a call option may involve the right to buy a commodity at a $10 price.

If the price was above $10, the option holder may exercise the option and buy the commodity at a price that was below the current market price.

Conversely, if the price was below $10, the option may be allowed to lapse and a transaction could be conducted at the current market price.

An option cannot have a negative value, and an option holder cannot suffer a loss through holding an option, apart from the cost that may have been involved in entering the position.

In effect, buying an option involves purchasing the chance of a profit, while writing an option involves giving up the chance of a profit, or accepting the chance of a loss, in return for payment.

For example, in the case of a collar within a price range of $8 to $10, the business purchases a call option at $10 in order to protect from a possible loss if the price of the raw material rises above $10.

This involves purchasing an option that would have a positive value if the market price was above $10, that would offset the loss that would have occurred through purchasing the materials at the higher price.

This is known as “buying upside”, as the business purchases the chance of a profit-making position appearing.

“Upside” refers to a positive return, not to a rising price.

A positive return may occur from either a rise or a fall in a price, depending on whether the exposure is a long position or a short position.

The business is also exposed to a potential benefit if the price of the supplies fell to a low level.

This benefit can be sold.

For example, writing the put option at the $8 level involves receiving income from writing the option.

If the market price fell below $8, the put option may be exercised, and the business would receive the materials at a sale price of $8, rather than the lower market price.

In effect, the business is giving up the possibility of purchasing the materials at a price below $8, in return for payment.

This is known as “selling upside”.

If the value of the two options is equal, then this structure is known as a “zero cost collar”.

In this situation, the collar can be created for a zero cost.

For example, the market price of a commodity may currently be $15.

A put option may be written with a strike price of $13, and the income from writing the option could be used to purchase a call option with a strike price of $17.

This would lock the final purchase price for the material into the range of $13 to $17.

The benefit of eliminating the risk of the price rising above $17 would have been paid for by giving up the possibility of purchasing the materials below the $13 minimum cost of the collar.

Alternatively, a futures position is also a zero cost position, as this involves fixing the future price at the current time, and the lost risk of potential downside is equal to the lost benefit of possible upside.

5.3.8. Practical risk issues

5.3.8.1. Stability and risk

In some situations, conditions that have remained stable for long periods of time may change suddenly and unexpectedly.

For example, in the United States, the price of gold was fixed as $US 32 dollars per ounce for many years, when gold was used as a backing for the US currency.

The price of gold was floated in XX (** check year), and rapidly rose to levels of around (** check figures).

During the 1970's the price of oil rose sharply and became highly volatile, while in the late 1980's Australian interest rates rose to previously unheard of levels, with floating interest rates reaching 17% (**check figures).

In some respects, the possibility of a sudden end to stability may present a greater risk to a business than continual volatility.

In case of volatile prices, a business must be structured to operate effectively within the volatile environment.

Also, this situation may allow price data to be accumulated, and experience with price patterns to be developed.

This may provide input to valuation models, and provide a basis for structuring the business operation.

However, in the case of previously stable conditions, the business may be exposed to a negative impact, and there may be little precedent to use for valuation models or for planning.

In general, a business should avoid making assumptions that previously stable conditions will continue in the future.

For example, entering a long-term fixed-price contract, based on assumptions that past conditions will continue, may create a risk for a business.

This possibility may be addressed by calculating maximum risk exposures, even in cases of stable prices, and using risk management methods such as forward sales and options when exposures occur, even when prices have previously been stable.

5.3.8.2. The accuracy of risk calculations

Risk calculations are based on a range of assumptions, and in times of extreme conditions, the actual loss may not reflect the loss that was expected based on risk estimates and experience.

This issue may be addressed by ensuring that the risk exposures are based on calculations that may accurately reflect conditions that may arise in extreme conditions, and by ensuring that the risks are accurately assessed and managed.

For example, although statistical analysis can be used in banking and insurance, in practice the standards of credit assessment and underwriting may have a larger impact on losses that statistical models may suggest based purely on probabilities.

Also, some complex instruments and hedging portfolios may be difficult to value, and risk exposure calculations at current levels may differ from the actual exposure during crash conditions.

5.3.9. Risk calculation & trading terms

American style option	An option that allows the option to be exercised at any time up until the maturity date. This is not related to the location of options trading, and American-style options are traded in many places and circumstances.
Ask price	An offer to sell a fixed quantity of items at a specified price in a bid-and-offer market, also known simply as an "offer".
Bid	An offer to buy a certain volume of a commodity at a certain price, lodged in a bid-and-offer market such as a stock exchange.
Book	A collection of risks, also known as a portfolio in the case of assets.
Call option	An options contract which involves the right to buy a certain quantity of a commodity, in contrast to a put option.
Close out	The act of cancelling an open futures position by entering an opposite position, which results in the position being cancelled, and the current profit or loss being realised.
Covered position	A position in which the business currently holds the physical commodity that would need to be delivered into a risk instrument, such as a futures contract.
Crash test	Re-valuing a portfolio assuming price changes based on a market crash, to determine the risk exposure of the portfolio.
Derivative	An instrument in which the price of the instrument is based on the price of another commodity. This includes futures and options, but not shares or bonds.
European style option	An option in which the option can only be exercised on the expiry date, in contrast to an American-style option. The term "European" does not refer to a location in this context, and European-style options are traded in many places and situations.
Exchange-traded instrument	An instrument that can be bought or sold through an exchange such as a stock exchange or a futures exchange.
Exercising an option	An action performed by the holder of an

	option, to specifying that they wish the option transaction to proceed. When this occurs, the buy or sell order on which the option is based is conducted.
Exposure	Holding a trading position involving one or more tradable instruments, or having an underlying exposure to risk, such as holding a physical commodity, or having a requirement to purchase or deliver commodities in the future.
Forward	A contract to buy to sell a commodity at a future date at a fixed price. An equivalent exchange-traded instrument would be a futures contract.
Futures contract	A traded instrument that involves entering an agreement to conduct a buy or sell transaction of a fixed quantity of a commodity at a fixed price on a future date.
Instrument	A contract, such as a futures contract or an option contract.
Liquidity	The volume of trading that occurs in a particular instrument. Low liquidity may lead to difficulty in entering and exiting positions.
Long position	A position in which the business would benefit from an increase in price, such as ownership of an asset
Margin	A payment lodged with a broker to meet the value of a loss-making position, to reduce the credit risk of defaults on futures and options contracts.
Market maker	A party in a dealer market that "makes a market" by quoting a buy and a sell price when requested to by a client.
Modelling	Creating a set of formulas for representing the value of an instrument or a portfolio, so that the price and the risk exposures can be calculated.
Monte Carlo simulation	A method of determining the price and risk exposures of risk instruments, based on generating a large number of random prices, and calculating the average result.
Naked position	A position in which the business does not currently hold the commodity that would need to be delivered in to a risk instrument, such as an option or futures contract.

Offer	See “ask price”
Option	A risk management instrument that provides the option holder with the option of conducting a buy or sell transaction at a fixed price over a fixed period of time, or allowing the option to lapse with no transaction occurring.
Option holder	The party that buys an option, and has the right to exercise the option and indicate that they wish the options transaction to proceed
Option lapse	If the option holder takes no action before the expiry date of the option, then no transaction occurs, and the option lapses.
Option writer	The party that creates an option, and must deliver of accept the commodity if the option buyer exercises the option.
Over-the-counter	A transaction, such as an option, entered directly with the counterparty, which is generally a bank.
Position	Holding a current exposure to risk through an instrument, such as entering a futures contract, buying or writing an option, or a combination of separate positions.
Premium	The payment made for purchasing an option.
Put option	An options contract which involves the right to sell a certain quantity of a commodity, in contrast to a call option.
Risk	In the context of contracts and tradable instruments, a “risk” is a contract or situation which may result in a profit or loss occurring for the business.
Risk Pricing	Using formulas and simulations to determine the value of a risk instrument.
Short position	A position in which a business would benefit from a fall in price, such as exposure to a raw material price.
Strike price	The price at which a buy or sell transaction will occur under an options contract, if the option is exercised.
Swap	A financial instrument in which one party pays a fixed interest rate stream to the other party, and receives a floating interest rate stream from the other party. The net difference between the two rates is paid on each interest payment date.

Value-at-risk	A method of assessing risk, based on the loss that would occur at a certain probability price movement. (**check details)
Write	The act of creating an option, in which case the option writer receives the payment from selling the option, and must deliver or accept the option commodity if the option holder exercises the option.

5.4. Insurance

Insurance may be used in many circumstances in which an event may have a negative impact on a business.

Insurance generally involves a payment in advance, with a payment being made to the business if the insurance event occurs.

The amount of the premium may be based on the probability that the event will occur, and the size of the payment.

This is known as risk-based insurance.

Insurance in the commercial context is generally risk-based.

Other types of insurance arrangements are used some circumstances, such as in some health insurance systems.

In these situations, the premiums may not reflect the risk of the event occurring, and the scheme may be considered to be a savings scheme in certain respects, rather than an insurance scheme.

5.4.1. Insurable events

A wide range of events can be insured.

This may include some of the following major areas.

5.4.1.1. Physical items

Items of equipment, buildings, inventories of supplies and complete manufacturing facilities may all be insured.

Payments may be made in the event of damage, destruction or loss caused by a range of events, including fire and theft.

General insurance for physical items is generally a cost-effective form of insurance, with payments being based on the size and the probability of a loss.

5.4.1.2. Legal action

In some cases, insurance policies may be used to meet the payments that may become due as a result of legal action.

These policies generally cover specific types of legal action.

This would not include general legal action against the business for a breach of a contract.

Insurance can be arranged for some of the following types of legal action.

Public liability	Legal action resulting to injury occurring to a member of the public, such as a customer injuring themselves while in the business premises.
Professional indemnity	Legal action relating to negligence in a position of legal responsibility such as a director or a trustee.

The premiums of legal liability insurance policies may be large in some cases, due to the large payments that are sometimes determined in legal actions.

However, payments of these sizes are often sufficient to lead to a personal bankruptcy or a major loss to a business.

Where they are applicable, insurance policies of this type may often be considered to be a pre-requisite before any business activity could be considered.

5.4.1.3. Injury

Insurance may be available to meet payments for medical expenses, lost income and so forth in the case of an injury occurring to an employee while engaged in activities related to the business operation.

This is a separate issue from a negligence legal action against the business.

In some situations, insurance of this type, and possibly other forms of insurance, may be required by commercial regulations before a business may engage in business operations.

5.4.1.4. Business continuity insurance

Business continuity insurance involves making payments to allow the business operation to continue in the event of a major problem occurring such as a fire within a manufacturing facility.

The payments from a business continuity policy may be used to hire temporary facilities, purchase supplies of raw materials, and so on.

This may continue for a limited period of time until the main facilities were reconstructed.

5.4.1.5. Specific purpose

In the case of large transactions, specific insurance arrangements can sometimes be made with an insurer to cover an individual event.

This may occur when the event can be clearly defined, where an estimate can be made of the probabilities, and where the risk is not excessively high.

As an example, the launch of a communications satellite may be insured.

In this situation, a premium may be paid to insure the event, and in the case that the satellite was destroyed during the launch or was not successfully deployed, a payment would be made according to the policy arrangements.

As another example, underwriting arrangements are commonly used in floats of companies.

In these situations, if subscriptions from investors are not received for the full set of shares, then an underwriting arrangement may involve an investment bank purchasing the remaining shares directly from the company.

5.4.1.6. Summary of business insurances

Physical items	Loss of or damage to equipment, buildings, materials stocks, manufacturing facilities, and so on.
Legal action	Professional indemnity. Legal action relating to negligence. Public liability. Legal action relating to public injury.
Injury	Worker's compensation relating to injury during business activity.
Business continuity	Payments in relation to continuing operations during temporary problems such as a facility being damaged by fire.
Specific purpose	Any large event which can be clearly defined, and in which the probabilities can be estimated.

(** injuries/losses relating to products, liability/insurance etc)

5.4.2. Methods of insurance

5.4.2.1. Underwriting operations

Insurance may be arranged through insurance companies.

The process of providing insurance and calculating premiums is known as underwriting.

Insurance as a business involves maintaining a sum of equity capital, which is used to meet payments as they become due.

Premiums are collected and payments are made.

A large number of separate risks may generally be held, which may lead to the total value of assets, income and payments being reasonably stable.

The large number of individual risks may result in an average return being generated, rather than the large rise or fall in value that could occur in the case of a single risk.

5.4.2.2. Self insurance

In the case of a large organisation, a self-insurance arrangement may sometimes be practical.

This may involve the business bearing the risks directly, rather than arranging insurance with an external party.

Unfunded arrangements

In an unfunded arrangement, the risk of loss is borne directly by the cash flow of the business.

For example, a business may have a large number of small items of office equipment in various locations.

Under an insurance scheme, the premiums paid over the long term may approximately match the losses that may occur from time to time.

In situations such as these, insurance may not be used, with the losses that occur being recorded as expenses within the general revenue and expenses of the business.

Funded arrangements

Alternatively, a "funded" arrangement may be used.

In this case, a fixed amount of money is allocated in each period, in a similar way to an insurance premium.

This money is then set aside in a separate fund, and used to meet payments that may be necessary when losses occur.

The fund may be a separate bank account, although in most cases this would be an accounting entry within the records of the business's liabilities.

5.4.2.3. Risk instruments

In the case of some financial transactions, risk instruments could be used in the context of insuring against adverse events.

For example, a "put" option allows an asset to be sold at a fixed price for a period of time, and this may insure the business against the risk of a market price falling during this time.

Similarly, a "call" option could be used to enable the business to purchase commodities at a fixed price for a period of time, and so reduce the risk of a loss arising from raw materials rising in price.

Options may sometimes be included in contracts with other parties.

For example, a large property development could be purchased from a developer, and the contract may include a "put" option that may allow any unsold units to be sold back to the developer at a reduced price, if buyers could not be found within a specified period of time.

5.5. Finance

Finance involves funding business activities, valuing assets, and valuing cash flows.

In particular, finance is concerned with calculations involving money.

Financial calculations occur in many areas of business.

This includes some of the following items

Structures	The structure of the balance sheet, including debt, equity and asset values, the structure of the profit and loss statement, including income, expenses, net profit and so on.

Margins	Margins of net cash flow to sales, profit margins, etc.
Ratios	Gearing ratios, return on assets, return on equity, price to earnings ratios and so on.
Time value of money	Calculations involving loan payments, the present value of future income, project cash flows, and so on.

Analysis of cash flows from a business perspective may involve allocating cash flows to periods of time, such as monthly periods.

This may enable figures such as income, expenses and margins to be calculated.

Analysis from a financial perspective may involve considering the date on which each cash flow occurs or is due to occur.

This view may be used in cases involving long term cash flow structures, such as loans and projects, and in situations where large cash flows occur with small margins.

5.5.1. The basis of finance

Finance is generally concerned with two issues; asset values, and cash flows.

Cash flows

A cash flow is defined by the following three values

- The size of the cash flow.
- The sign of the cash flow, being either an inflow or an outflow.
- The date on which the cash flow occurs.

The size of a cash flow may be a fixed value, or it may be an expected average value based on a set of probabilities.

In cases where cash flows occur on fixed dates, all cash flow structures can be modelling using this approach.

There is no requirement to distinguish between “interest” and “principal” payment on loans, for example, nor is it necessary to maintain a concept of a ‘loan balance”.

For example, in the case of corporate bonds, interest payments are known as “coupon payments”, the principal repayment is known as a “face value redemption”, and calculations involving cash flows may not involve the type or purpose of the cash flow.

However, the principal-and-interest model may be a useful view for certain situations, such as the early termination of a loan agreement.

Financial calculations generally involve cash flows occurring on fixed dates.

In cases where a cash flow could occur at any time within a period, such as a building being destroyed by fire and an insurance payment being made, a more complex approach that the standard time-value-of-money approach may be needed.

Asset values

An asset value is defined by two parameters.

These are the following two items.

- The value of the asset.
- The date on which the value applies.

The change in an asset value between two dates is known as a “return”.

Value transfers

A cash flow may involve a transfer of actual cash.

In practice this would not generally involve currency such as coin and bank notes, but would involve a transfer between bank accounts using a cheque or a direct transfer.

In the finance context, the term "cash" generally involves money held in bank accounts, rather than physical currency.

A transfer of value can also occur when other assets are transferred.

For example, the settlement of a property purchase may involve a cash transfer from the buyer to the seller, and a value transfer from the seller to the buyer, when the title of the property is registered in the name of the buyer.

Value transfers that occur due to inflows or outflows of assets can be viewed in the same way as cash flows, and the same calculations can be used.

5.5.2. Properties of cash flows

Financial calculations may generally consider a set of cash flows occurring on various dates.

Individual cash flows

One convention could involve representing cash inflows as positive numbers, and representing cash outflows as negative numbers.

Cash flows of the same size and sign, and occurring on the same date, are equivalent.

Separation of cash flows

Cash flows that occur on the same date can be added and subtracted to determine the total net cash flow.

Also, when a transaction involves several cash flows, each cash flow can be considered separately.

For example, a bond may involve a series of interest payments.

The initial value of the bond can be determined by converting each individual payment to an equivalent payment on the commencement date, and summing

the present values of each individual payment to determine the total bond value.

Cash flows on different dates

Cash flows of the same size that occur on different dates are not equivalent.

In these cases, directly adding and subtracting cash flows does not determined the effective net value of the cash flows.

This can be determined by converting each cash flow to an equivalent value on the same date, before the values are added or subtracted.

Uncertain cash flows

In some cases, the size of a cash flow may be unknown, and may be based on a set of possible values and probabilities.

In these cases, the cash flow can be converted to an equivalent effective value by calculating the weighted average value of the set of possible values, before any other financial calculations are performed.

Asset values

The market value of an asset can be considered to be a potential cash flow.

In other words, the market value of an asset may be the size of the cash flow that could be generated if the asset was bought or sold.

Calculations involving asset values may be performed using the same approach as calculations involving actual cash flows.

Accounting

Accounting involves directly adding cash flows that occur within a period to determine a total value for the period.

This is a practical approach in many circumstances.

However, while this approach can be used to determine the total dollar amount of a set of payments, it is not strictly valid as an approach to determine the total effective value of the payments that may be involved.

5.5.3. Conventions

The formulas in this section use variables in the following formats

Variable	Value
y	The interest rate per period, in decimal format
n	The total number of periods
amount	The value of a single cash flow
payment	Thr payment amount per period
present value	The value on the current date, or an early date
future value	The value at a future date

In the case of monthly calculations, the following formulas would apply

$$y = \frac{\text{annual percentage interest rate}}{1200}$$

$$n = \text{number of years} \times 12$$

5.5.4. Conversions

Interest rate figures can be converted using the following equations.

$$\text{decimal rate} = \frac{\text{percentage rate}}{100}$$

$$\text{percentage rate} = \text{decimal rate} \times 100$$

All calculations are performed using a number of compounding periods, rather than a number of years.

For example, the interest rate for one period can be calculated using the following equation.

$$\text{rate per period} = \frac{\text{annual rate}}{\text{periods per year}}$$

The number of periods can be calculated using the following formula.

$$\text{number of periods} = \text{periods per year} \times \text{number of years}$$

For example, a loan may involve an annual interest rate of 8%, with monthly payments over a five year term.

The following steps could be taken before any loan calculations were performed.

$$\text{decimal interest rate} = \frac{\text{percentage interest rate}}{100}$$

$$= \frac{8}{100}$$

$$= 0.08$$

$$\text{rate per period} = \frac{\text{annual interest rate}}{12}$$

$$= \frac{0.08}{12}$$

$$= 0.006667$$

$$\text{number of periods} = \text{periods per year} \times \text{number of years}$$

$$= 12 \times 5$$

$$= 60$$

Annual figures

Annual figures can be determined from per-period figures using the following formulas.

$$\text{annual payment} = \text{periods per year} \times \text{payment}$$

$$\text{annual rate} = \text{rate per period} \times \text{periods per year}$$

Exponentiation

The “exponentiation” operation involves raising one number to the power of another number.

This is represented in the form y^x.

This operation involves the value “y” being multiplied by itself “x” times.

For example, 3^5 is equal to 3 x 3 x 3 x 3 x 3, which is 243.

This function may be available on calculators that include scientific or financial calculations, and within computer software such as spreadsheet programs.

5.5.5. The time value of money

The effective value of a cash flow is dependant on the date on which it occurs.

For example, an amount of $100 that is received today is not equivalent to an amount of $100 that is received in one year's time.

At an interest rate of 8%, the amount that is received today could be invested, and may grow to a value of $108 at the end of the year.

At this time, the first payment would be worth $108, however the alternative payment would only be worth $100.

This illustrates that the two payments are not equivalent, as they occur on different dates.

This principle is known as the "time value of money".

A cash flow that occurs on one date can be converted to an equivalent value on any other date by using a time-value-of-money calculation.

5.5.5.1. Present values

A present value calculation involves converting a future payment to an equivalent value on an earlier date.

In the case of a single period, the following formula can be used to calculate the present value of a future payment.

$$\text{present value} = \frac{\text{future value}}{1 + \text{interest rate}}$$

This is the fundamental relationship of the time value of money.

All time-value calculations, no matter how complex, are based on this relationship.

In the case of a time frame covering several periods, the following formula can be used

$$\text{present value} = \frac{\text{amount}}{(1+y)^n}$$

As interest payments are not involved, the term "discount rate" may be used for the rate that is used in the calculation, rather than the term "interest rate".

As an example, an amount of $100 may be due to be received in five years time.

Assuming a discount rate of 10%, the present value of this amount could be calculated using the following example.

$$\text{present value} = \frac{100}{(1+0.1)^5}$$

$$= \frac{100}{1.1^5}$$

$$= \frac{100}{1.6105}$$

$$= \$62$$

This example illustrates that a payment of $100 that was due to be received in five years would be equivalent to a payment of $62 that was received immediately.

This example assumes that compounding occurs annually, with interest being paid and re-invested each year.

5.5.5.2. Future values

A future value involves determining the effective value of a cash flow on a future date.

The formula used is the same formula that is used to calculate a present value, however the formula is re-arranged to calculate the future amount rather than the earlier amount.

For example, the following formula could be used to calculate a future value.

$$\text{future value} = \text{amount} \times (1 + y)^n$$

For example, an amount of $20 may be placed on deposit at an interest rate of 7%.

As the end of a five year period, the equivalent value could be determined from the following example

$$\text{future value} = 20 \times (1 + 0.07)^5$$

$$= \$28$$

The same calculations may be used whether interest is actually received, or whether a cash flow on one date is simply converted to an equivalent value on a different date.

5.5.5.3. Partial periods

In cases where the time period does not exactly match a whole number of periods, the following adjustments can be made to the standard formulas.

Less than one period

If the length of time is less than a full period, the following formulas can be used

$$\text{present value} = \frac{\text{amount}}{\left(1 + \frac{\text{days}}{\text{days in period}} \times y\right)}$$

$$\text{future value} = \text{amount} \times \left(1 + \frac{\text{days}}{\text{days in period}} \times y\right)$$

For example, an amount of $20 may be due in six month's time.

Assuming an annual interest rate of 7%, the present value could be calculated using the following example

Amount	20	
Days	182	(6 months)
Days-in-period	365	
Decimal interest rate	0.07	

$$\text{value} = \frac{20}{\left(1 + \frac{182}{365} \times 0.07\right)}$$

$$= \$19.33$$

Multiple periods

In cases where a time period is greater than a single period, but is not exactly equal to a whole number of periods, the following formulas can be used

$$\text{present value} = \frac{\text{amount}}{(1+y)^{\frac{\text{days}}{\text{days in period}}}}$$

$$\text{future value} = \text{amount} \times (1+y)^{\frac{\text{days}}{\text{days in period}}}$$

For example, a similar amount to the previous example may be due in eighteen months time.

In this case, the present value could be calculated using the following example.

$$\text{days} = 365 \times 1.5 = 548$$

$$\text{present value} = \frac{20}{(1 + 0.07)^{\frac{548}{365}}}$$

$$= \frac{20}{(1 + 0.07)^{1.5014}}$$

$$= \$18.07$$

In cases where the time period exactly matches a whole number of periods, these formulas become the standard present value and future value formulas.

5.5.5.4. Annuities

An “annuity” is a series of regular payments.

For example, the interest payments of a bond, the repayments of a loan, and a stream of future income cash flows, are all examples of annuities.

5.5.5.4.1. The present value of an annuity

The present value of a set of annuity payments can be calculated by calculating the present value of each payment separately, and summing the amounts to determine a total present value for all the payments on a certain date.

However, in the case of a series of payments of the same size and timing, the following formula can also be used to calculate the present value of the payments.

$$\text{present value} = \text{payment} \times \frac{1 - (1 + y)^{-n}}{y}$$

The following conditions apply to this formula.

Payments	The first payment occurs at the end of the first period, the number of payments is equal to the number of periods, and the last payment occurs at the end of the last period.
Compounding	Compounding occurs with each period.

For example, a bond may involve interest payments of $5 each six months, for a total period of five years.

Assuming an interest rate of 8%, the total present value of these payments could be calculated using the following example

$$\text{rate per period} = \frac{\text{annual rate}}{\text{periods per year}}$$

$$= \frac{0.08}{12}$$

$$= 0.006667$$

$$\text{present value} = \text{payment} \times \frac{1-(1+y)^{-n}}{y}$$

$$= 5 \times \frac{1-(1+0.006667)^{-60}}{0.006667}$$

$$= \$40.55$$

This example illustrates that the payments of $5 every six months for five years would be equivalent to a single amount of $40.55 that is paid immediately, assuming a discount rate of 8% for the future payments.

At the end of the five year period, the principal value of the bond may be repaid.

In the case of a face value of $100, the face value could be converted to an equivalent present value using the present value formula.

For example, the following calculation may apply.

$$\text{value} = \frac{100}{(1 + 0.08)^5}$$

$$= \$68.06$$

The total value of the bond would then be equal to the total present values of the interest payments and the principal payment.

This could be calculated using the following example.

$$\text{bond value} = 40.55 + 68.06$$

$$= \$108.61$$

5.5.5.4.2. The future value of an annuity

The future value of an annuity can be calculated using the following formula

$$\text{future value} = \text{payment} \times \frac{(1 + y)^n - 1}{y}$$

This formula is based on the same set of conditions as the present value formula.

For example, an amount of $10 may be deposited each month for a period of three years, with an annual interest rate of 8% being paid on a monthly basis.

The future value at the end of the three year period could be calculated using the following example

$$\text{interest rate} = \frac{8}{1200} = 0.00667$$

$$\text{future value} = \text{payment} \times \frac{(1+y)^n - 1}{y}$$

$$= 10 \times \frac{(1+0.006667)^{36} - 1}{0.006667}$$

$$= \$405$$

5.5.5.4.3. Growth annuities

In some situations, the payments may not be constant, but may grow at a certain rate.

For example, the income from a project may be projected over a period of ten years.

The income may be estimated at $30 per year in the first year, growing at 5% each year in line with inflation.

In the case of growing annuity payments, the following formulas can be used in place of the standard annuity formulas.

$$\text{present value} = \frac{\text{payment}}{g - y} \times \left[\frac{(1+g)^{n+1}}{(1+y)^n} - 1 - g \right]$$

$$\text{future value} = \frac{\text{amount}}{g - y} \left[(1+g)\left((1+g)^n - (1+y)^n \right) \right]$$

In these formulas, the variable “g” is the growth rate of the payments per period, in decimal format.

These formulas apply in cases where the growth rate may be higher or lower than the discount rate.

In situations where the growth rate is equal to the discount rate, the following formulas may be used.

$$\text{present value} = \text{payment} \times n$$

$$\text{future value} = \text{payment} \times n \times (1 + y)^n$$

5.5.5.4.4. Perpetual annuities

Perpetual annuities involve payments that continue forever.

For example, in the year (** check year), the British government issued a number of bonds known as “consols”.

These bonds paid interest at a rate of (**check), with interest payments to continue on a six-monthly basis forever.

Several hundred years later, interest payments are still made on these bonds, and a small number of consols are still traded in London capital markets.

Perpetual annuity calculations can be used in a range of circumstances.

For example, bank deposits and shares are effectively perpetual investments, as the interest or dividend payments do not occur for a limited period of time, and in theory could continue forever unless circumstances changed.

Also, payments that occur on very distant dates may have very small present values.

In the case of some long-term investments, a perpetual annuity calculation may be used to provide an approximate value, ignoring the fact that the payments may cease at a distant time.

The present value of a perpetual annuity can be calculated using the following formula.

$$\text{present value} = \frac{\text{payment}}{y}$$

For example, an annuity income stream, such as rental income, may involve payments of $30 per year.

Assuming a discount rate of 8%, the present value of these payments could be calculated using the following example.

$$\text{present value} = \frac{30}{0.08}$$

$$= \$375$$

In cases where the payments increase as time passes, the following formula can be used.

$$\text{present value} = \frac{\text{amount}}{y - g}$$

In this formula, “y” is the discount rate, and “g” is the rate of increase in the payments.

This formula applies when the growth rate is less than the discount rate.

When the growth rate is equal to the discount rate, or higher than the discount rate, then the value of a growing perpetual annuity is infinite.

5.5.5.5. Net Present Value

In the case of a complex set of cash flows, such as a bond, or the cash flows from a project, the present value of each individual payment can be summed on a single date, to determine a total value for the set of cash flows.

This is known as a “net present value” calculation.

Net present values are used to value projects, businesses, financial instruments, properties, and any situation where a series of future cash flows may occur.

For example, a project may involve a cost of $80 per year for three years, followed by income of $50 per year for fifteen years.

Assuming a discount rate of 12%, the income stream could be reduced to an effective value at the three-year point by using the annuity formula.

For example, the following calculation could be used

$$\text{value} = \text{payment} \times \frac{1-(1+y)^{-n}}{y}$$

$$= 50 \times \frac{1-(1+0.12)^{-15}}{0.12}$$

$$= \$340$$

This value represents the value of the income annuity stream at the commencement of the income, which may occur at the three-year point in the project.

This figure could then be reduced to a present value at the beginning of the project, using the present value formula.

For example, the following calculation may apply.

$$\text{present value} = \frac{340}{(1+0.12)^3}$$

$$= \$242$$

This value represents the present value, at the commencement of the project, of the future income stream.

The present value of the costs could be calculated using the annuity formula.

The following calculation may apply in this case.

$$\text{value} = \text{payment} \times \frac{1-(1+y)^{-n}}{y}$$

$$= -80 \times \frac{1-(1+0.12)^{-3}}{0.12}$$

$$= -\$192$$

The total value of the project could then be calculated from summing the present values of all the cash flows, including the cash inflows and the cash outflows.

For example

$$\text{net present value} = 242 - 192$$

$$= \$50$$

Major issues in performing a net present value calculation may include estimating the possible future cash flows, and selecting a discount rate to apply to the calculation.

Net present value calculations are also known as “discounted cash flow” calculations.

5.5.5.6. Internal Rate of Return

In some cases, a complete set of cash flows may be known.

In these situations, the effective discount rate that applies to the set of cash flows may be determined.

This is known as an “internal rate of return” calculation.

For example, the cash inflow of a loan, and the cash outflows of the repayments, could be balanced to a net present value of zero, to determine the interest rate that was embedded within the loan structure.

The IRR is calculated by determining the discount rate than leads to the net present value of the set of cash flows being equal to zero.

To calculate an internal rate of return, there must be at least one positive cash flow and one negative cash flow.

In the case of purchasing an investment, an initial negative cash flow may represent the purchase price, while a series of positive cash flows may represent income from the investment or from increases in value.

The IRR cannot generally be calculated directly using a formula.

The net-present-value approach must be used, and a discount rate must be determined that results in the net present value being approximately equal to zero.

This can be done using a trial-and-error approach, selecting various discount rates, or by using computer software such as a spreadsheet program, that includes a goal-seeking function.

For example, a bond may be available for purchase at a price of $109.

The bond may include interest payments of $5 each six months for five years, followed by a principal repayment of $100.

The net value of the transaction would be equal to the present value of the income and the principal payments, minus the purchase price of the bond.

Selecting a discount rate that results in this total equalling zero, leads to a figure of 7.8%

This is the IRR of the bond purchase, at a purchase price of $109.

In other terms, purchasing the bond at this price would relate to an investment return of 7.9%.

However, as each payment occurs at a different point in time, this would only be equivalent to investing the entire amount at a rate of 7.9% if the early payments could be re-invested at this rate.

Multiple IRR figures

The IRR approach can be used to determine an effective return from investing in a project that may involve a set of cash inflows and cash outflows.

In the case of investments with one cash outflow and then a series of cash inflows, only one IRR value is possible

This value could be considered to be the investment return.

However, in some cases, more than one possible value for the IRR may exist.

When the cash flows change from a positive value to a negative value more than once during the total period, the number of possible IRR figures may be equal to the number of times that the cash flows change sign.

In these cases, each figure may be mathematically valid, and the IRR approach may have limited practical application as an indication of an investment return.

Hurdle rates

Situations such as these are sometimes addressed by selecting a "hurdle rate" for investment projects.

The hurdle rate is chosen as a target or minimum rate of return from a project.

In some cases, the hurdle rate is determined from the weighted average cost of capital of the organisation.

In theory, investing in projects that involved a higher return than the cost of capital may result in a profitable investment.

In other cases, a range of different project alternatives may be available.

In this situation, a hurdle rate may be chosen so that sufficient projects were selected to enable the available capital to be fully invested.

The hurdle rate is used as a discount rate in a net present value calculation.

A positive NPV figure, calculated using the hurdle rate, may suggest that the rate of return from the project may exceed the hurdle rate.

Investment returns

The internal rate of return of a bond is known as the bond's "yield to maturity".

In the case of a single cash inflow and a single outflow, the internal rate of return is equal to the investment return of the cash flows.

In the case of a more complex set of cash flows, the IRR can also be considered an investment return.

However, this would only lead to an actual investment return in a case where early payments could be re-invested at the same rate as the IRR.

In some situations, a single cash outflow may be followed by several cash inflows, such as in the case of a bond.

In this case, the initial payment could be viewed as a combination of several separate investments over different time frames, corresponding to each cash inflow.

While the IRR may be a useful measure of an investment return, it may not match the return of investing an initial sum over a single period of time.

5.5.5.7. Interest

The interest due on a loan or a deposit can be calculated using the following formula

$$\text{interest} = \text{amount} \times \frac{\text{annual percentage interest rate}}{100} \times \frac{\text{number of days}}{365}$$

In the case of monthly calculations, the number of months divided by 12 could be used, rather than the number of days divided by 365.

For example, a loan of $40 may have interest payable monthly, at an annual interest rate of 9%.

The interest for a month could be calculated using the following example

$$\text{interest} = 40 \times \frac{9}{100} \times \frac{31}{365}$$

$$= \$0.31$$

5.5.5.8. Specific situations

The fundamental financial relationship of the present value of a cash flow can be used to determine the effective values of cash flows in any situation, no matter how complex.

A number of specific situations may include some of the following items.

5.5.5.8.1. Amortising loans.

An amortising loan involves payments that are larger than the initial interest payment.

Amortising loans can be viewed in two ways.

One perspective involves a “loan balance”, which reduces to zero over the term of the loan, with loan payments covering both interest and principal amounts.

An alternative perspective involves a cash inflow followed by a series of cash outflows.

In this view, there is no separation between “interest” payments and “principal” payments, and there is no concept of a current “loan balance”.

The loan structure simply involves a series of positive and negative cash flows.

This is the view that may generally be used in financial calculations.

Both views are perspectives on the same set of cash flows.

The loan-balance view may be useful in reviewing the payment that would be involved in terminating a loan arrangement before the end of the period.

Alternatively, the cash flow structure perspective may allow cash flows of arbitrary complexity to be simply modelled.

The repayments due on an amortising loan can be calculated using the annuity formula.

The can be rearranged into the following format.

$$\text{payment} = \text{loan value} \times \frac{y}{1-(1+y)^{-n}}$$

For example, a loan with a value of $100 may have a term of 10 years and an interest rate of 9%.

Assuming monthly repayments, the repayment amount on this loan could be calculated using the following example.

$$\text{interest rate} = \frac{9}{1200} = 0.0075$$

$$\text{payment} = 100 \times \frac{0.0075}{1-(1+0.0075)^{-120}}$$

$$= \$1.27$$

5.5.5.8.2. Sinking funds

In some situations, periodic payments may be made into a fund with the aim of accumulating a sum of money.

For example, a machine may be purchased with an expected operating lifetime of eight years.

Monthly payments may be made into an account to accumulate a lump sum at the end of the eight year period, to enable a replacement machine to be purchased.

This is known as a “sinking fund”.

A sinking fund may involve a separate bank account, although in most cases this would simply be an accounting entry in the records of the liabilities of the business.

The payments that are required for a sinking fund can be determined using the annuity formula.

As a first step, the final value may need to be calculated.

For example, the machine may have a value of $100.

Assuming an inflation rate of 5%, the amount that would be required to replace the machine at the end of the eight year period could be calculated using the future value formula.

For example, in this case the following calculation may apply.

$$\text{future value} = \text{amount} \times (1 + y)^n$$

$$= 100 \times (1 + 0.05)^8$$

$$= \$147$$

This indicates that an amount of $147 would be needed in eight year’s time to replace the machine, assuming an inflation rate of 5%.

The payments could then be calculated using the following formula.

$$\text{payment} = \text{amount} \times \frac{y}{1 - (1 + y)^{-n}}$$

For example, assuming that an interest rate of 7% was available and that monthly payments were made, the following calculation may be used.

$$\text{interest rate} = \frac{7}{1200} = 0.005833$$

$$\text{payment} = 147 \times \frac{0.005833}{1 - (1 + 0.005833)^{-96}}$$

$$= \$2.00$$

This calculation suggests that payments of $2.00 per month would need to be made into an account earning 7% interest, in order to accumulate a value of $147 in eight year's time.

5.5.5.8.3. Embedded interest rates

In some cases, the payments of a loan structure may be known, however the interest rate may be unknown.

For example, an item of equipment may be available for purchase in a single payment, or through a series of instalments.

In a situation such as this, the interest rate that is included within the payment structure may be calculated.

In order to perform this calculation, the equivalent value of the transaction as a single lump sum must be known.

This may be available as a separate quoted price for an immediate purchase, or in other cases the value of the item could be estimated from the sale price of similar items.

The interest rate that is included within a payment structure can be calculated using an internal-rate-of-return calculation.

This may involve calculating the present value of the payments, using the annuity formula, or calculating the present value of each individual payment.

Discount rates may then by altered using trial-and-error, or using a goal-seeking function such as a spreadsheet program, until a rate is found that sets

the present value of the payments to equal the fixed initial lump sum payment.

For example, a machine may be available for immediate purchase for $100, on through monthly payments of $3.20 for three years.

The present value of the payments could be calculated using the annuity formula, as listed below

$$\text{value} = 3.20 \times \frac{1 - (1 + y)^{-36}}{y}$$

Altering the value of "y" until the present value equalled the lump-sum price of $100, leads to a figure of 0.00786 for the monthly interest rate.

Multiplying by twelve, this implies an annual interest rate of 9.4%.

5.5.5.8.4. Income streams

In some cases, a large payment may be made as a cash outflow, and a series of regular income payments may occur over a period of time, involving cash inflows.

This may apply in the case of investing in developing a new product or facility, for example.

Also, this situation may apply to purchasing a large item of capital equipment, with a regular series of income payments occurring from charging fees for the use of the equipment.

As an example, a machine may be available for purchase at a cost of $70

The expected income may be $10 per year over a fifteen year life of the machine.

In this situation, the internal rate of return of the cash flows could be calculated, by determining the discount rate that resulted in the annuity formula equalling the purchase cost of $70

This internal rate of return could be used as a measure of the investment return involved in purchasing the machine.

Alternatively, a discount rate could be chosen.

For example, a discount rate of 15% may be chosen, considering the level of current interest rates and the risk involved in the project.

The present value of the income stream could then be calculated using annuity formula.

For example

$$\text{value} = 10 \times \frac{1 - (1 + 0.15)^{-15}}{0.15}$$

$$= \$76$$

As the present value of the income stream is higher than the cost of the machine, this may represent a worthwhile investment.

The cost of the machine could also be added as a cash flow to determine the total net-present-value of the cash flows

$$\text{net present value} = 76 - 70$$

$$= +6$$

5.5.6. Variable returns

In some cases, the rate of return that may apply may differ from one period to the next.

The term "return" is often used in the case of changing assets values, while "interest rate" or "discount rate" may be used in the case of cash flows.

However, the same concept applies, and the same calculations may be involved in each case.

Different returns may apply in each period in the case of investment returns, changing asset values, and “forward rates”, where a different interest rate applies in each future period.

In these cases, the total return over a period can be calculated using the following formula.

$$\text{total return} = (1 + \text{interest rate}) \text{ for each period multiplied together}$$

For example, the return figures of 10%, 3% and 5% may apply for three periods.

In this example, the total return could be calculated in the following way.

$$\text{total return} = (1 + 0.1) \times (1 + 0.03) \times (1 + 0.05) - 1$$

$$= 19.0\%$$

This formula can be expressed in the future value form, using the following formula

$$\text{future value} = \text{amount multiplied by } (1 + \text{interest rate}) \text{ for each period}$$

For example, an amount of $100 may have interest rates of 4%, 2% and 3% applying to it for three consecutive periods.

The future value of this amount could be calculated using the following example.

$$\text{future value} = 100 \times (1 + 0.04) \times (1 + 0.02) \times (1 + 0.03)$$

$$= 109.26$$

In the case that all the returns or interest rates are the same, this formula becomes the standard future value formula.

Average returns

An average return could be calculated using the standard arithmetic average of the individual returns.

However, due to the fact that the returns are multiplied, not added, the arithmetic average may not equal the return that would apply to each single period.

In other terms, using the arithmetic average return for each period may not produce the same result as using the individual returns.

For this reason, a more accurate measure of an average return may be the "geometric average" return.

This can be calculated using the following formula

Geometric average = (1 + interest rate) multiplied together, raised to the power of (1 / number of periods)

For example, in the previous case of the returns of 10%, 3% and 5%, the geometric average could be calculated using the following example.

$$\text{geometric average} = \left[(1+0.1)\times(1+0.03)\times(1+0.05)\right]^{\frac{1}{3}} - 1$$

$$= \left[(1+0.1)\times(1+0.03)\times(1+0.05)\right]^{0.3333} - 1$$

$$= 5.96\ \%$$

This rate represents an average rate over the period, in the sense that replacing each individual rate by this figure would lead to the same final result as using the individual figures.

This can be verified by using the following example

$$\text{total return} = (1 + 0.0596) \times (1 + 0.0596) \times (1 + 0.0596)$$

$$= 19\ \%$$

This calculation, using the geometric average return in each period, produces the same total return as the previous calculation.

This figure could also be used in the standard future value formula.

For example, repeating this calculation using the future value formula, may result in the following result.

$$\text{future value} = 100 \times (1 + 0.0596)^3$$

$$= 119$$

$$\text{return} = \frac{\text{future value}}{\text{present value}} - 1$$

$$= \frac{119}{100} - 1$$

$$= 19\ \%$$

This example illustrates that the future value formula is a simplified case of the product of each individual return, and applies in the case that the returns for each period are the same.

5.5.7. Volatility

The volatility of a series of values may be measured using the standard deviation of the set of numbers.

In the case of market prices, the standard deviation of the percentage changes may be used, rather than the values themselves.

This may apply in cases of data series that follow a “random walk” process, in which case the value of each point may be based on a random value centred on the previous point, rather than a random value centred on a fixed point, as may be the case for data such as a series of cash flows or customer numbers.

5.5.7.1. Volatility over different time periods

The standard deviation that may apply over different time frames may be calculated using the following formula

$$\text{standard deviation} = \text{period standard deviation} \times \sqrt{\text{number of periods}}$$

For example, the standard deviation of the monthly price changes of a market price may be 8%.

The standard deviation of annual price changes may then be calculated using the following example.

$$\text{annual standard deviation} = 8 \times \sqrt{12}$$

$$= 27.7\%$$

This result is less than twelve times the monthly standard deviation, as individual months may partly cancel each other out, leading to an annual standard deviation that may be less than twelve times the monthly standard deviation.

Technically, this formula may only apply in cases where independent random values are added together, rather than multiplied.

In the case of price returns, the returns are multiplied, rather than added.

However, for most practical sets of figures, a similar result may occur in each case.

5.5.7.2. Portfolio standard deviation

When several items may be combined into a portfolio, the standard deviation of the entire portfolio may be estimated.

For example, a business may have an exposure to several raw material prices.

The net exposure to the material costs may then be estimated using a portfolio approach.

The following formula may be used for estimating the standard deviation of a portfolio

$$\text{standard deviation} = \sqrt{\text{sum of all combinations of } w_1 \times w_2 \times sd_1 \times sd_2 \times r}$$

Where each term in the equation has the following meaning

w_1	The weight of the first asset within the portfolio, with the total weights summing to 1.0.
w_2	The weight of the second asset within the portfolio.
sd_1	The standard deviation of the first asset.
sd_2	The standard deviation of the second asset.
r	The correlation between the returns of asset 1 and asset 2.

This formula may be derived from the definition of variance, in a situation were several random variables are added to form a single total.

For example, a business may have a price exposure to three raw materials.

The market prices of the raw materials may vary in line with the figures in the following example.

	Standard Deviation	Weight
Material A	12%	0.3
Material B	5%	0.5
Material C	11%	0.2

	Correlation
Material A – Material B	0.4
Material A – Material C	-0.2
Material B – Material C	0.7

The correlation of a price with itself is 1, while the correlation between material A and material B is the same as the correlation between material B and material A.

The total net price exposure may then be calculated using the following example.

$$\text{standard deviation} = \sqrt{\text{sum of all combinations of } w_1 \times w_2 \times sd_1 \times sd_2 \times r}$$

= 0.3 x 0.3 x 12 x 12 x 1 +	(material A-A)
0.3 x 0.5 x 12 x 5 x 0.4 +	(material A-B)
0.3 x 0.2 x 12 x 11 x -0.2 +	(material A-C)
0.5 x 0.3 x 5 x 12 x 0.4 +	(material B-A)
0.5 x 0.5 x 5 x 5 x 1 +	(material B-B)
0.5 x 0.2 x 5 x 11 x 0.7 +	(material B-C)
0.2 x 0.3 x 11 x 12 x -0.2 +	(material C-A)
0.2 x 0.5 x 11 x 5 x 0.7 +	(material C-B)
0.2 x 0.2 x 11 x 11 x 1 +	(material C-C)

= 6.0 %

In this example, the total exposure of the business costs may have a standard deviation of 6%, based on the correlations, weights and standard deviations of the price changes of the three raw materials.

Independent variables

An "independent" set of variables may involve a set of variables in which the value of one variable may not be related to the value of another variable.

In this case, the correlation between the values may be zero.

For example, this may occur in situations such as portfolios of bank loans or insurance risks.

In the case of independent variables, the formula may be simplified to the following example.

$$\text{standard deviation} = \sqrt{\text{sum of } w^2 \times \text{standard deviation}^2 \text{ for each asset}}$$

Equally weighted portfolios

An "equally weighted" portfolio may involve a portfolio in which each asset has the same weight within the portfolio.

As an example of the general effect of diversification, in the case of an equally weighted portfolio of independent assets, where each asset had the same standard deviation, following formula may apply.

$$\text{standard deviation} = \frac{\text{standard deviation of an asset}}{\sqrt{\text{number of assets}}}$$

This formula may be derived by applying the general formula to this particular case.

5.5.8. Uncertain cash flows

In some situations, such a loan structures, the size of each cash flow may be known in advance.

In other situations, the size of a cash flow may be uncertain.

There may be a probability that the cash flow may not occur, such as a default on a payment that is due, or an expense not being required for one reason or another.

Also, a cash flow may have several possible values.

For example, future income from a project development may have an unknown value, while the value of a financial instrument may be linked to a volatile market price.

In these situations, each cash flow can be replaced by its effective value, before other calculations are performed.

The effective value of a cash flow can be calculated from the weighted average of the possible values, with the probability of each value occurring being used as the weight for that value.

This calculation defines the fundamental value of an uncertain cash flow that may occur on a specific date.

Specific calculations can be performed to determine this value in some of the following circumstances.

Single uncertain cash flow

When a cash flow has a fixed value, however there is a probability that the cash flow may or may not occur, the effective value can be calculated using the following formula.

$$\text{effective value} = \text{probability} \times \text{amount}$$

In this formula, the probability is the probability that the cash flow will occur.

For example, an assumption may be made that there may be a 2% chance of a default on a particular payment that may be due.

In other terms, a probability of 98%, or 0.98, may be assumed for receiving the payment.

In the case of a payment of $80, the effective value of this payment could be calculated using the following example.

$$\text{value} = 0.98 \times 80$$

$$= \$78.40$$

This figure could then be used in further calculations, such as determining the present value of the payment.

Probabilities can be calculated from historical data using the following approach

$$\text{probability} = \frac{\text{actual events or value}}{\text{total events or value}}$$

For example, if 1000 sample products were distributed and 230 sales resulted, then the probability of a sale occurring from a sample product could be calculated using the following example.

$$\text{probability} = \frac{230}{1000}$$

$$= 0.23$$

Multiple discrete values

In some cases, several possible values may exist for the value of a cash flow.

In these situations, the effective value can be calculated from the weighted average of the possible values, with the probability of each value occurring being used as the weight for the value.

The effective value can be calculated using the following formula

$$\text{value} = \text{sum of probabiliy} \times \text{value for each possible value}$$

For example, a set of scenarios may be estimated for the value of the income from a project.

Probabilities could be estimated, such as in the following example.

Income	Probability
20	10 %
30	60 %
50	30 %

The effective value of the income amount could then be calculated using the following example

$$\text{value} = \text{sum of probabiliy} \times \text{value for each possible value}$$

$$\text{value} = 20 \times 0.1 + 30 \times 0.6 + 50 \times 0.3$$

$$= 35$$

Continuous possible values

In some cases, a continuous set of possible values could occur.

This may apply to the value of an asset, for example, or the value of a cash transfer that was linked to a market price.

In these situations, the effective value remains equal to the average value of the possible outcomes.

This value may be estimated using a range of methods, such as modelling the possible values as a large number of small bands, or creating a computer simulation of the possible results.

These methods are discussed in more detail in the section beginning on page 655.

5.5.9. Discount rates

A discount rate must be selected in order to preform a present value calculation.

In number of issues may be relevant in selecting a discount rate.

5.5.9.1. Known rates

In some situations, the discount rate that applies to a particular situation may be known.

For example, the interest rate of a loan may be a specified figure.

Also, a “hurdle rate” may be used within an organisation for the calculation of project net present values.

For example, a hurdle rate of 15% may be used.

In this case, net-present-value calculations could be performed using a discount rate of 15%.

A positive or negative net-present-value figure may then be used to determine whether a project proceeded or not.

In other situations, a specific interest rate or discount rate may not apply.

For example, a future payment may be converted to a present value, or the net-present-value of a large project may be calculated.

In these situations, a discount rate must be selected in order to perform the calculations.

5.5.9.2. The structure of a rate

Interest rates and discount rates can be divided into a number of components.

Technically speaking, these components should be multiplied together in order to determine a total rate.

However, for most practical values of the relevant components, a similar result occurs by adding the components together.

Also, each component is often an estimate in any case, and so the precision that may be involved in a correct calculation may not result in any added benefit.

Example rate structure

As an example of the components of an interest rate, the interest rate of a five year corporate bond may be 11%.

One approach to reviewing the interest rate may involve decomposing the rate into the following components.

3%	Credit risk premium
1%	Additional premium for term, i.e. a long-term bond
3 %	Real rate of return
4 %	Inflation expectation
11 %	Total interest rate

In this example, the interest rate of 11% of the bond is decomposed into four independent components.

The inflation component involves an interest return in order to ensure that the value of the sum of money remains stable.

In the case of an inflation rate of 5%, for example, this inflation figure would imply that a fixed sum of money would decrease in value by 5% each year.

An interest rate of 5% would involve a cash flow of interest payments.

The actual value of this sum of money would then remain constant, with the increase in the dollar amount of the funds being equal to the increase in prices throughout the economy.

The “real rate” of return represents the increase in value that is involved in the lending transaction.

This is similar to a fee for borrowing an asset, and is the effective return to the lender.

In the case of long term fixed rates, an additional “term” premium may be involved.

On average, long-term fixed rates may be higher than short-term rates.

A number of possible reasons have been proposed to explain why this effect occurs.

Possible explanations include the fact that the value of long-term fixed-interest securities has a higher volatility than an equivalent short-term security, and the possibility that borrowers may prefer to borrow for long term periods in order to ensure a supply of capital, while lenders may prefer short-term periods in order to retain access to funds.

The “credit risk” premium is a component of the interest rate that reflects the chance of a default occurring on the bond payments.

This value may be approximately equal to the probability of a loss of value, due to an insolvency of the company.

5.5.9.3. Discount rates

5.5.9.3.1. Risk premiums

In the case of discount rates that are applied to future cash flows, the following rate structure presents one possible set of rate components.

Risk premium	a
Real rate of return	b
Inflation expectation	c
Total discount rate	a + b + c

The inflation rate varies considerably from time to time.

In Australia over the last 100 years, the inflation rate has varied between rates of close to zero, and rates of around 15%.

Similar results have occurred in most other developed economies.

An average figure of around 3% has applied over the long term.

Real rates of return vary within a much narrower band than inflation or the total interest rate.

Real rates of return have varied in a range from approximately -1% to +5%.

An average real rate of return in stable economic conditions is around 3%.

Base rates

In determining a discount rate, a "base rate" may be used.

The base rate may be a bank lending rate that is used as a reference rate for lending, or a typical interest rate that may apply to low-risk assets such as government bonds.

Using a base interest rate may then lead to the following structure for a discount rate

Risk premium	a
Base rate	b
Total discount rate	a + b

In some cases, a floating interest rate may be used as a base rate.

However, during times of particularly high or low floating rates, a long-term rate may be used as the base rate.

For example, in the case of very long term projections, a rate such as a 20-year government bond rate may be used to estimate a long term base interest rate.

In the case of shorter periods, a term may be selected that may cover the majority of the period of the cash flows.

This may allow both the expected inflation, and the expected average floating rate over the period to be included within the base rate figure.

For example, in the case of cash flows that may extended over five years, the rate of a five-year government bond may be selected as a base rate.

(** components of base rates, matching terms with different term cash flows)

Risk premiums

The risk premium that is selected may be based on the risk that is involved in the project.

A high risk premium may be relevant for projects or structures with volatile cash flows, or with uncertain outcomes.

Conversely, a low risk premium may be relevant in the case of cash flows that are stable and predictable.

Suggested risk premiums

The following table presents some possible risk premium ranges for different situations and projects.

Activity	Risk Premium Range	Examples
Low risk	2% - 4%	Stable property investments, infrastructure investments such as toll roads, government bonds, highly-rated corporate bonds
Medium risk	4% - 8%	Purchasing an existing stable business, gradual expansion of a successful product, constructing facilities that have a saleable value.
High risk	8% - 25%	New business start-ups, product developments of experimental designs, launching products within completely new markets.

Figure 12

For example, a base rate of 8% may currently be used by a large bank as a reference rate for lending.

A project to construct a new facility to be sold on completion may be planned.

Based on the nature of the facility being constructed, an estimate may be made that the project has a medium-risk nature, and a risk premium of 6% may be chosen.

The discount rate could then be determined using the following approach.

Risk premium	6%
Base rate	8%
Discount rate	14%

This discount rate of 14% could then be used to calculate the present value of the project costs and income, and to determine a net-present-value for the project.

5.5.9.3.2. The cost of capital

5.5.9.3.2.1. The Capital Asset Pricing Model

The Capital Asset Pricing Model is a theoretical model of asset prices.

This model is based on an argument that involves the price of assets being set by market forces, based on the correlation of returns between different assets.

Under this model, the expected rate of return of an asset may be estimated from the rate of return of the entire market of assets, and the correlation between the asset in question and the market.

The CAPM equation may appear in the following form

$$r_s = \beta(r_m - r_f) - r_f$$

A key factor in this model is the "beta" of the asset, which is represented by the Greek letter β.

In this equation, the beta represents the term in a regression equation between the asset returns and the market returns (** regression vs. probabilities)

This figure may be estimated from a regression process, using a set of historical asset price returns and historical market returns.

A typical asset may have a beta value of 1.

Beta values of more than 1 may apply to highly volatile assets, while beta values of less than 1 may apply to assets with low volatility, or with a low correlation to the market return.

The term r_m refers to the expected long-term return of the market.

The term r_f refers to a risk-free interest rate, such as a rate than may be available on a short term government bond.

As an example, the following figures may be estimated

$$r_m = 8\%$$

$$r_f = 5\%$$

$$\beta = 1.2$$

Using these figures, the estimated long-term return of the asset could by calculated using the following example

$$r_s = \beta(r_m - r_f) - r_f$$

$$= 1.2 \times (0.08 - 0.05) + 0.05$$

$$= 8.6\%$$

The CAPM is used as a foundation for asset return modelling, and particularly for determining discount rates.

However, this model rests on a number of significant assumptions.

The most significant of these may be the assumption that the price of assets is set by a “mean-variance optimisation” process.

This may require that the great majority of investment decisions are based on the affect that an asset may have on the risk of a portfolio, when added to a diversified portfolio of assets.

This assumption may have a questionable basis in reality.

Empirical tests of the CAPM, comparing expected returns to actual returns, have produced mixed results.

However, in the absence of alternative models, the CAPM may be used to select discount rates and estimate asset returns.

Also, the CAPM may introduce a volatility adjustment into the determination of discount rates, which may be consistent with the general approach of increasing discount rates for higher risk projects.

Alternatively, a discount rate may be determined by selecting a base rate and a risk premium, based on the overall risk and volatility of a project.

5.5.9.3.2.2. Weighted Average Cost of Capital

The estimated long term return for an asset, as calculated from the CAPM, is also known as the “cost of equity”.

This figure may be compared to the “cost of debt”, being the interest rate of the debt funds.

In the business-centred financing view, debt and equity are simply alternative methods of raising capital.

Interest costs must be paid on debt, while the estimated return may reflect the expected return on the equity funds.

A weighted average of the two figures may be used to determine the average cost of capital for the business’s entire capital.

This value may be calculated using the following approach.

$$\text{weighted average cost of capital} = \frac{\text{debt} \times \text{cost of debt} + \text{equity} \times \text{cost of equity}}{\text{debt} + \text{equity}}$$

For example, the following figures may apply to a particular situation

Debt	$20
Equity	$70
Debt interest rate	8%
Cost of equity (calculated from CAPM)	12 %

The effective average cost of the business's capital may then be calculated using the following example.

$$\text{weighted average cost of capital} = \frac{20 \times 0.08 + 70 \times 0.12}{20 + 70}$$

$$= 11.1\%$$

This figure may be equivalent to a debt interest rate if the business was funded entirely through debt, or a cost of equity value, if the business was funded entirely with equity.

The weighted average cost of capital figure may have used as a discount rate for discounting cash flows for new products, projects and so on.

Alternatively, a discount rate could be selected from a base rate, and a risk premium may be added based on the risk and volatility of the project.

5.5.9.4. Real rate calculations

In the case of long-term projections, rather than discounting specific cash flows, calculations may be based on real, rather than nominal, changes.

A nominal rate or value reflects an actual price or cash flow, while a "real" value represents a value that has been adjusted for inflation.

In these situations, initial figures may be estimated for sales, costs and so on.

Figures may also be estimated for annual increases in sales and costs.

In these cases, an inflation component could be included in both the discount rate and the cash flow projections, or the inflation component may be removed from both items.

For example, the following table presents two sets of figures for a project.

The first set of figure uses actual projections for sales values, and uses a discount rate that includes an inflation component.

The second set of figures estimates a real growth rate in sales, and uses a discount rate that does not contain an inflation component.

Inflation	5%		0%	
Sales increase	7%		2%	
Discount rate	12%		7%	
Year	Nominal Sales	Present Value	Real Sales	Present Value
0	1,000	1,000	1,000	1,000
1	1,071	953	1,020	953
2	1,147	909	1,040	909
3	1,228	866	1,061	866
4	1,316	826	1,082	826
5	1,409	787	1,104	787
6	1,509	750	1,126	750
7	1,616	715	1,149	715
8	1,731	682	1,172	682
9	1,854	650	1,195	650
Net present value		8,139		8,139

Possible benefits with using the real calculations include the fact that an inflation value does not need to be estimated, and also that the underlying increases or decreases in value may be clearer in this case.

5.5.10. Issues in time value calculations

5.5.10.1. Periods & compounding

Compound interest occurs when interest is paid and re-invested in the total balance.

For example, interest may be paid on a deposit annually, with the total amount being invested for a further year.

Although actual interest payments may not be involved in present value and future value calculations, these calculations generally assume that a compounding effect occurs.

For example, the standard present value formula applies in cases where compounding occurs in each period.

In the case of loans, the compounding frequency of the loan calculation may be equal to the payment frequency.

In calculations that apply to each payment as it occurs, the net effect is that the compounding frequency becomes equal to the payment frequency.

For example, in a loan where monthly payments were made, interest calculations could also be performed using monthly periods.

Payment/compounding period conversions

In some cases, the payment frequency may not be the same as the compounding frequency.

For example, payments may be made monthly, with interest calculations being performed on a quarterly basis.

In these situations, the following conversions could be performed to enable the standard formulas to be used.

$$\text{number of periods} = \text{compounding periods per year} \times \text{number of years}$$

$$\text{interest rate} = \frac{\text{nominal annual interest rate}}{\text{compounding periods per year}}$$

$$\text{effective payment} = \text{actual payment} \times \frac{\text{payment periods per year}}{\text{compounding periods per year}}$$

$$\text{actual payment} = \text{effective payment} \times \frac{\text{compounding periods per year}}{\text{payment periods per year}}$$

For example, a 7 year loan for $100, at an interest rate of 8%, may involve monthly payments, with interest calculations being performed quarterly.

The repayments on a loan of this type could be calculated using the following example

$$\text{number of periods} = 4 \times 7 = 28$$

$$\text{interest rate} = \frac{0.08}{4} = 0.02$$

$$\text{effective payment} = 100 \times \frac{0.02}{1 - (1 + 0.02)^{-28}}$$

$$= \$4.70$$

$$\text{actual payment} = 4.7 \times \frac{4}{12}$$

$$= \$1.57$$

5.5.10.2. Interest rate conversions

The interest rate that is relevant for present value formulas is the interest rate that applies to a single compounding period.

For example, a structure involving monthly calculations may use a monthly interest rate.

However, interest rates a generally presented as annual figures.

A “nominal annual interest rate” is an annual rate that represents the actual interest rate.

This is calculated by using the following formula

$$\text{nominal annual rate} = \text{rate per period} \times \text{periods per year}$$

However, when there is more than one period per year, the actual rate over a full year may be slightly higher than this, due to the compound interest effect occurring within the year.

An “effective annual rate” is the equivalent rate that would apply to calculations performed over a single period of a year.

For example, an amount of $80 could be deposited at a nominal rate of 7% per annum, with interest calculated and paid monthly.

The per-period rate can be calculated using the following example.

$$\text{rate per period} = \frac{\text{nominal annual rate}}{\text{periods per year}}$$

$$= \frac{0.07}{12}$$

$$= 0.005833$$

Using the future value formula, the value of the $80 would have the following equivalent value at the end of a full year.

$$\text{future value} = \text{amount} \times (1 + y)^n$$

$$= 80 \times (1 + 0.005833)^{12}$$

$$= \$85.78$$

Using simple interest, an amount of $80 for one year at 7% would result in the following value

$$\text{value} = 80 + 80 \times \frac{7}{100}$$

$$= \$85.60$$

This illustrates that the nominal rate does not specify the effective annual rate, as an additional $0.18 amount occurred due to compounding.

The effective annual rate specifies that actual return that would occur over a full year.

In contrast, the nominal rate applies to a single period, such as a month, but is multiplied by the number of periods to represent an approximate annual figure.

Conversions between nominal and effective rates can be performed using the following formulas

$$\text{effective annual rate} = \left(1 + \frac{\text{nominal annual rate}}{\text{num periods per year}}\right)^{\text{num periods per year}} - 1$$

$$\text{nominal annual rate} = \left(1 + \text{effective annual rate}\right)^{\left(\frac{1}{\text{num perionds per year}}\right)} - 1$$

For example, a nominal annual rate of 9% payable monthly, could be converted into the equivalent effective annual rate using the following calculation.

$$\text{effective annual rate} = \left(1 + \frac{0.09}{12}\right)^{12} - 1$$

$$= 9.38\ \%$$

Rates that are expressed in a form such as “7% payable monthly” may be nominal rates, unless they are specified to be effective annual rates.

5.5.10.3. Continuously compounding rates

A compounding frequency may be annual, semi-annual, quarterly, monthly, daily, or some other period, depending on the particular situation.

The compounding frequency can also be reduced until it reaches the limit of compounding occurring continuously, with an infinite number of compounding periods.

This is known as a continuously compounding rate.

Continuously compounding rates may be used in a number of situations, and may be useful in the case of investment returns, where an underlying investment may increase in size on a continuous basis, rather than increasing due to specific interest payments.

The continuously compounding rate can be calculated from the effective annual rate using the following formula.

$$\text{continuously compounding rate} = \ln(1 + \text{effective annual rate})$$

In this formula, the function “ln” is the natural logarithm, and is available as a function within some calculators, and also in software such as spreadsheet programs.

For example, an effective annual rate of 12% could be converted to the equivalent continuously compounding rate using the following example.

$$\text{continuously compounding rate} = \ln\left(1 + \frac{12}{100}\right)$$

$$= 11.3\%$$

The continuously compounding figure is always less than nominal or effective figures, as the continuously compounding figure incorporates the limit of the compounding effect than may occur within a rate.

The nominal, effective and continuously compounding figures all represent the same underlying interest rate, and are simply alternative ways of expressing a single rate of increase or discount.

5.5.11. Finance terms & abbreviations

Amortising structure	A structure in which the principal amount reduces to zero through the term of a loan. In the more general case of cash flows, without assuming a "loan balance" or "outstanding principal" concept, an amortising structure is one in which a series of regular payments may be made, without a large payments being involved at the end of the term of the structure.
Annuity	A series of regular payments, such as income from licence fees, or repayments of a loan.
CAPM	Capital Asset Pricing Model. This is a theoretical model of the pricing of securities and assets, that may be used to estimate a cost of equity and an estimated return from an asset.
Coupon payment	A payment of a bond, which is effectively an interest payment. Coupon payments from a bond may often be paid twice-yearly.
Coupon rate	The rate of interest paid on a bond. This term derives from early bonds, which had small paper coupons attached for each interest payment, with each coupon being used to claim an interest payment on the relevant date.
DCF	Discounted Cash Flow. This term DCF value or DCF analysis may be used in reference to calculating an NPV. A DCF value may apply to a set of cash flows, while an NPV could also be calculated for asset values.
Discount rate	A rate that is used to reduce a future value to an equivalent value on an earlier date.
Face Value	The value that is paid at the end of the term of a bond or discount security. When a bond is issued at an interest rate that is equal to current market rates, the face value may be equal to the initial amount that is invested to purchase the bond.
Future Value	The equivalent value of a cash flow on a later date.
Hurdle rate	A target investment rate that is used as a discount rate within an organisation. The hurdle rate may be used as a discount rate to calculate an NPV. A positive NPV figure may then suggest that the project returns may exceed the minimum hurdle

	rate of return, and this may be used to determine whether to proceed with a project or not
Interest rate	A rate that specifies a percentage rate of interest payment on an amount of a debt. For example, a debt of $80 at an interest rate of 10%, may correspond to an interest payment of $8.
IRR	Internal Rate of Return. This figure is the discount rate that results in the net present value of a set of positive and negative cash flows being zero. This may be interpreted as an investment return from a set of cash flows, although this may only strictly apply when early cash flows could be re-invested at the IRR rate.
NPV	Net Present Value. The NPV is the sum of the present value of several payments, such as a set of income and expense payments. The NPV is the effective value of the combination of cash flows, as a single figure on a single date.
Present Value	The equivalent value of a cash flow on an earlier date.
Risk premium	An additional component that is added to a base rate to determine a discount rate. The risk premium reduces the value of a cash flow or project, to reflect the risk or volatility that may be involved in the activity.
Risk-adjusted discount rate	A discount rate that includes a risk premium, to adjust for the effect of the risk of a project or cash flow.
WACC	Weighted Average Cost of Capital. This figure is determined from weighted average of the cost of debt, being the debt interest rate, and the cost of equity, which may be determined from the CAPM. The WACC figure may be interpreted as the effective cost of the business's total capital, and this figure may be used as a discount rate, for calculating a net present value for cash flows such as new projects.

5.6. Economics

Economics is concerned with questions about trade and production.

This involves some deeply fundamental issues.

There are several ideas involving economics that are relevant to business.

5.6.1. Money

Money can be considered to be an item of value, in a similar way to gold, buildings and equipment.

In this sense, money is simply another item of value, along with many other items of value.

This concept is important in the context of trade.

Money as a commodity is particularly illustrated when foreign currencies are involved.

A business may hold Australian dollars, Swiss Francs, Thai Baht and Japanese Yen.

Money may be used as a reference point for valuing an asset, however there is no particular reason that this needs to be the case.

For example, a building could be valued as being equivalent to 100 trucks, rather than 200 dollars.

5.6.2. Trade

Trade involves exchanging one item for another.

In most cases, one of the items involves a sum of money.

“Buying” is one side of a trade, and involves exchanging money for another item.

“Selling” one side of a trade, and involves exchanging an item for money.

All trades that involve a sum of money and an item are a buying transaction for one of the parties, and a selling transaction for the other party.

“Barter” is a trade that involves exchanging one item for another item, with neither item being a sum of cash.

“Foreign Exchange” is a trade that involves exchanging an amount of one currency for an amount of another currency.

In all these cases, a trade simply involves exchanging one item for another item, usually of similar value.

Value is not directly gained or lost through trade, buying or selling.

A trade simply involves transforming the value that is held by the business into another form, such as exchanging cash for an item of equipment, or exchanging an item of equipment for cash.

In the case of manufacturing, as an example, the value is created when an item is made, not when it is sold.

The sale transaction simply involves exchanging a completed item for another asset of equal value, being the cash payment for the item.

5.6.3. Lending and Borrowing

Lending and borrowing occurs in a wide range of areas within business.

In the commercial context, a fee is generally paid from the borrower of an item to the lender, in exchange for the use of the item for a period of time.

In the case of lending or borrowing a building for occupancy, this corresponds to rent.

In the case of lending or borrowing money, the fee corresponds to interest.

Lending and borrowing in exchange for fees are commercial transactions, as is trade.

All loan transactions are a lending arrangement for one party, and a borrowing arrangement for the other party.

5.6.4. Competitive advantage

In many cases, a business or an individual may have the option of producing something directly, or buying it from others.

For example, one farmer may live in an arid area with a high level of sunshine, access to large areas of land, and an adequate rainfall.

Another farmer may live in a tropical area with high humidity, high rainfall and limited cleared land.

The first farmer may grow wheat and pineapples.

However, the pineapples may grow poorly in the desert environment.

The second farmer may also grow wheat and pineapples.

However, in this case the wheat may grow poorly in the limited space and high humidity of the tropical environment.

Both farmers may extend considerable resources for limited results.

However, the first farmer could devote his entire resources and effort to growing wheat, while the second farmer could grow only pineapples.

The farmers could then trade, with the wheat farmer trading wheat in exchange for pineapples, and the pineapple grower trading pineapples for wheat.

This concept is the basis of trade that has occurred for thousands of years.

In this situation, there may be large increase in the available wheat and pineapples that were produced.

This is known as the principle of competitive advantage.

This principle suggests that a higher output is produced by a business that performs the activities that it is in the strongest position to perform, and then trades with other parties to receive other goods and services.

Although the principle of competitive advantage is a fundamental concept, there are two serious limitations with this approach.

The first relates to transport costs.

Fresh water, for example, could be transported in tankers from high rainfall areas to desert regions.

However, this does not generally occur, as the transport costs would be prohibitive.

Some goods are too heavily, bulky or spoil too quickly to be transported long distances.

For example, wheat is often traded between countries, however bread is not, as bread is bulky, spoils quickly, and can be easily made as it is needed.

5.6.4.1. Specialisation & trade vs. internal resources & independence

A second issue relates to independence.

In the previous example, the wheat farmer only grows only wheat and the pineapple grower only grows pineapples.

This situation may work without problems for an extended period of time.

However, one day the wheat farmer may cease operations and stop producing wheat.

This could happen for a wide range of reasons.

Bread is a staple food, and without grain for flour the pineapple grower could be in serious trouble.

In other cases, the wheat farmer could take more malicious action.

The wheat farmer may raise the price of wheat drastically, or make demands of the pineapple grower.

The pineapple grower may be forced to comply with the wheat farmer's demands, at least in the short term, having no other way to obtain the grain that was needed.

In effect, by changing from a generalised, self sufficient existence to one based on specialisation and trade, the farmer has given the other farmer power over himself.

This issue has important implications in business and in international trade.

For example, during the 1970's, the oil-producing nations of the Middle East, through the OPEC organisation, agreed with each other to increase the price of oil dramatically.

By all raising the price at the same time, the oil buyers had no choice but to pay the higher prices.

Oil is a major input to the economies of the Western world.

This action caused a wave of inflation to flow through the economies of the West and lead to major structural change.

A transfer of wealth from the West to the Middle East, measured in hundreds of billions of dollars occurred.

The response to this action, apart from intense political lobbying, was to develop other oil fields around the world, such as the North Sea oil field operated from the British Isles.

The higher oil price resulted in oil fields that had previously been uneconomic becoming economically viable.

On a smaller scale, this issue may arise when a business is heavily dependant on a single supplier or customer.

Action by the supplier or customer may be deliberate, such as the price negotiations for the sale of bulk commodities such as coal, which may involve intense negations between a few suppliers and a few customers.

In other situations a supplier may cease delivery of supplies or a customer may cease ordering products for a variety of reasons.

Several steps may be taken to minimise the risk that this type of situation may have a major negative impact on the business.

Where possible, sourcing supplies from several suppliers, and providing products or services to a wide range of customers, may reduce the risk that a break in trade with a single customer or supplier may have a major impact on the business.

Also, buying and selling in open markets, rather than directly with individual businesses, may also reduce the risk of problems occurring.

Finally, maintaining internal alternatives may also be possible in some cases.

For example, back-up generators are frequently installed in commercial buildings to supply power if the commercial power supply fails for a period of time.

5.6.5. Economic Activity

Economic activity relates to the amount of commercial activity that is occurring within a region at a particular time.

This level of economic activity may vary significantly from time to time.

Economic activity involves manufacturing goods, construction, performing commercial services and so on.

The general level of economic activity is most commonly measured using a figure known as the Gross Domestic Product growth, or simply GDP growth.

This figure is widely quoted in the business press.

GDP growth is based on surveys that attempt to measure the approximate change in the total level of economic production compared to a previous period, such as the previous quarter or year.

During recessions, economic production may decline, and GDP growth may be a negative figure.

The general level of economic activity may have an impact on the sales and net income of a business.

Some industries, such as the building industry, are highly sensitive to the level of economic activity and activity may vary widely between boom conditions and recessions.

Other industries, such as food retailing, are largely independent of the general level of economic activity, and sales may not vary greatly from one economic environment to another.

5.6.6. Management of the economy

The activity within most capitalist economies, including the Australian economy, is governed by the central bank of the country.

In Australia, this is the Reserve Bank of Australia, which is governed by a board of governors who are appointed based on experience within business, economics and government.

The Reserve Bank is governed by the Constitution, and is independent of the government and the political process.

The primary tool in the control of the economy is the setting of short-term interest rates.

Low interest rates lead to an increase in borrowing, investing and economic activity, while high interest rates may lead to a decline in economic activity.

Strong economic activity may be associated with an increase in inflation, with may cause a range of serious problems within the economic activity of a country.

5.6.7. Cycles

Some industries are heavily cyclical, and pass through regular booms and declines.

The building industry fits within this category.

Residential building passes through a regular cycle, which tends to be a four year cycle, with two strong years followed by two weak years.

This pattern does not always repeat and every year is different from the previous one.

However, there may be large variations in activity at different periods of time.

Commercial building, involving large office buildings and other structures, is also cyclical, although over a longer period of time.

Commercial building may experiences a period of strong activity, which may last from several years to a decade, followed by many years of slow activity.

5.6.8. Seasonality

Various industries within the economy may be highly seasonal.

For example, agricultural products are generally produced at certain times of the year, while retail sales often peak during December.

5.6.9. Recessions and Booms

The underlying aim of economic management is usually to produce stable long-term growth in the economy.

However, many internal changes may happen within an economy and external events may also occur that may affect the level of activity.

Also, the tools that are available for managing an economy are limited.

Economics is not an exact science, and many issues concerning the operation and development of the economy are not fully understood.

Booms, recessions, and depressions have occurred in the past, and it is likely that these conditions will occur again in the future.

From the business perspective, the implications of this are that great changes may occur from time to time, and that flexibility in operations and development may be an important issue for the survival of a business during times of rapid economic change.

5.6.10. Inflation

Inflation is a situation that involves a broad increase in prices across most goods and services.

Deflation involves a broad fall in prices.

Deflation is comparatively rare, however it does occur at times during depressions and times of very low economic activity.

Moderate inflation may not have a significant impact on business operations.

High inflation, however, may have a number of implications for the operation of a business.

During periods of high inflation, accounting records may become distorted, as figures applying to different periods of time may have significantly different effective values.

When inflation is high, large cash flows due on future dates may need to be discounted to present values in order to properly manage the financing of the business.

For example, a payment of $100 due in one year's time may only be worth $85 at today's equivalent price level.

In general business operations, this may not be a significant issue.

In situations involving large future cash flows, the formulas in the section beginning on page 734 could be used to adjust the future value to an equivalent present value.

5.6.11. Technology & Structural Change

Changes in industry structure and the economy generally may be closely related to developments in technology.

For example, agriculture was once a major part of economic activity, however increases in technology and efficiency have resulted in food and other agricultural products being produced by an industry that represents only a few percent of the total economy.

Improvements in technology in manufacturing and mining, and the use of computer systems is general business processing, have resulted in many industries moving from labour-intensive processes, to operations based on large fixed assets, high volumes, low costs per item, and low output prices.

Service businesses are the growth sector of the economy, and now comprise a large proportion of all economic activity.

5.6.12. Aggregate profits

Economics provides some sobering thoughts for an individual considering a business venture.

The profit of a business is the increase in the assets within the business due to the operation of the business activities.

Across the economy, the economy grows at approximately 3% per annum.

In other terms, in a steady state situation, the total increase in assets is approximately 3% per year.

At an average inflation rate of 3%, the nominal dollar increase may be approximately 6% per annum.

All non-public assets are owned by individuals, either directly, or indirectly through companies and other business structures.

The average individual or business, then, would produce a profit of 3% of the amount invested in any particular year.

For each business that generates a profit above this level, there may be another business that produces a lower profit or a loss.

In any given year, a significant proportion of businesses may record a loss, involving negative net income and a decline in assets.

5.6.13. Resource allocation

Resource allocation refers to the way in which resources, ranging from capital, to equipment and services, are allocated to various projects or operations.

There are two broad approaches to resource allocation.

These could be described as the “planned allocation” method, and the “selected allocation” method.

In the planned allocation method, decisions are made to allocate resources to various uses or projects.

In the selected allocation method, the operation itself selects which resources to use.

The planned allocation method is used in the government sector, in large corporations, and in communist economies.

The selected allocation method is used in capitalist economies, and in individual enterprises.

This issue involves fundamental personal issues in addition to economic issues.

However, from the economic perspective, history has demonstrated that the selected allocation approach is far superior to planned allocation in deriving a greater result from the available resources.

Several major problems may occur with planned allocation.

Long time delays may be involved between the requirement for the resource appearing, and the resource finally being available for use.

This may result in projects taking far longer than would otherwise be the case, in costs being higher, and in some cases a project or activity may simply not be practical.

For example, despite the availability of ample natural resources, capital and engineering facilities, large scale production of modern cars did not occur in the former Soviet Union.

Another possible problem may relate to the allocation process.

In practice, planned allocation may result in a large amount of politics, fighting, and a range of activities and techniques being used in attempts to secure resources.

This may have several implications.

First, a resource may end up being allocated in a way that does not reflect the underlying uses to which the resources could be put.

Also, a great deal of time and effort may be spent in attempting to secure resources, rather than in performing other activities.

This issue may have considerable implications for large business organisations.

Large organisations effectively operate using the planned allocation model, which is based on central planned allocation of resources.

In fact, the term “enterprise resource planning” refers to an entire sub-section of software development and management activity.

In theory, the disadvantages of this approach should give an advantage to small organisations in comparison to large corporate activities.

However, within industries that operate with large economies of scale, the economies of scale available with large organisations generally outweigh the disadvantages of central planning.

In other cases, such as capital starvation, paralysed projects and product designs that cannot be changed, the limitations of planned allocation may lead to the collapse of a business.

One organisational model that became popular during the 1990’s may potentially increase the selectiveness of the allocation process.

This approach involved internal departments charging each other for products and services.

This does not generally involve physical transfers of money between bank accounts, but is included as accounting entries within the operations of the organisation.

For example, the computer support area may charge the administration area fees for support services, while a product design centre may charge a manufacturing operation licence fees for the use of a new product design.

Each area would then operate with a separate internal set of accounts, and operate as an independent business, within income and expenses.

This approach may assist in highlighting where the major costs areas occur within an organisation, and highlight the areas that are operating on a sustainable basis, and those which are not.

However, in practice this approach may have limited results.

Internal charging has no effect on allocation unless a party on either side of the arrangement, both in theory and in practice, has the option of discontinuing the arrangement and seeking alternative arrangements.

In many situations, this is not the case.

With an internal supplier, altering the level of service may involve approaching various committees, submitting proposals and business cases arguing the case for the additional support level, or simply continuing operations using whatever alternative means could be found to reduce the problem.

Although resource planning may be a component of many organisations, the issues involving resource allocation may have major implications for the structure and operation of a large corporate enterprise.

5.6.14. The capital markets

The capital markets are the facility that allows businesses to raise funds from the general public.

The capital markets and the banking system are the foundations of economic activity in a capitalist economy.

Funds may be raised as either equity or debt.

Both processes involve the issue of a prospectus, with investors subscribing cash in return for shares or bonds of the company.

The cash that is raised then becomes part of the company assets, and may be used to fund projects, replace facilities, and expand the business.

In the case of equity, the investors become part owners of the expanded business operation, with the previous investors owning a smaller proportion of a larger enterprise.

In the case of debt, interest payments would generally be made, with the face value of the bond being repaid according to the terms of the debt issue.

Shares are generally listed for trading on a stock exchange, and bonds may also be listed.

This facility allows an investor to enter a position in the business operation, or withdraw from the business operation, through buying or selling shares or bonds.

5.6.15. Markets

A market involves a place or a situation in which a large number of similar items are bought and sold.

This may include some of the following examples

- Fruit and vegetable markets.
- Craft markets.
- The stock market, involving buying and selling shares in companies.
- The market for crude oil.
- The labour market for employment contracts.
- The property market, involving buying and selling property.

The existence of a market simply requires a large number of buyers, and a large number of sellers, trading a range of similar goods

The term "commodity" is used to describe items or products that are sold in large volumes of similar goods.

For example, this term could be used to refer to commodities such as natural gas, paper, sugar, and standard computer hardware components.

5.6.15.1. Types of markets

Markets may occur in a particular physical location, or trades may be spread between different times and places.

For example, a fruit and vegetable market may take place in a large warehouse or an open air location.

A stock market may be organised through a stock exchange, which may involve an organisation arranging the lodgement of bids and offers, and the settlement of transactions.

Actual trading could occur within a single room, of through a network of computer system connections.

In other cases, a market may not correspond to a single time, place or activity.

For example, the property market could refer to the purchase and sale of land and buildings, occurring at various times and in various places, and arranged in various ways.

The labour market involves the market for employment.

While the prices within a property market may involve the buying and selling prices of properties, the prices within the labour market may correspond to the rates and salaries applying to various types of employment and various activities.

5.6.15.2. Volatility

The price of goods sold within markets may be stable, or the price may be highly volatile.

The stability of prices may be related to the stability of the supply of the items, and the stability of demand.

For example, the prices of manufactured items such as paper and steel may be reasonably stable, due to a steady supply, a steady demand, and steady trading volume.

In contrast, the price of fresh fruit may be volatile, due to supply varying with the time of the year, and the varying with the growing conditions within a particular season.

The prices of many commodities, including agricultural commodities, some mining commodities such as metals and oil, shares, and property may all be highly volatile.

5.6.15.3. Cycles

Some market prices and volumes trade through regular cycles.

These cycles may be predictable, or they may occur for random lengths of time.

For example, the supply and prices of agricultural products such as wheat and wool may vary according to the time of year.

In the case of building construction, the level of activity may be high for several years, followed by several years of very low activity.

5.6.15.4. Market prices

The price of goods that are bought and sold within markets may be set by the forces of supply and demand.

In general, when supply is limited and demand is high, an item may trade at a high price.

Conversely, when a large supply of an item is available, however demand is low, the item may trade at a low price.

This effect may occur due to the fact that different buyers may have a different level of interest in a product.

For example, some buyers may be willing to pay $8 for an item, other buyers may be willing to pay $10, and other buyers may be willing to pay $12.

In cases where supply is limited, trades may only occur between sellers and the buyers that bid $12, in which case the market price of the item would be $12.

In a case where ample supply was available, all trades may be conducted, and the market price may fall to $8.

All else being equal, a market price may stabilise at a level that reflects the customer's interest in a product, and the practical usefulness of the product.

Supply

In many situations the underlying demand for a product may be stable, and may reflect the practical usefulness of the item in various situations.

However, the supply of goods may often vary.

For example, the price of a mining commodity may be high for an extended period of time.

In this case, new exploration may be conducted and new mines may be developed.

Mines that were previously uneconomical due to a high cost of extracting the ore may become economically viable, and production may commence at these mines.

These activities may result in an increase in supply, and may result in a fall in price.

In general, the supply of a product may rise or fall depending on the price.

A high price may lead to the creation of new facilities and increased supply, while a low price may lead to closure of facilities and a reduction in supply.

However, a long time delay may be involved in some cases, in supply levels adjusting to demand.

This may lead to volatile prices, and periods of profits or losses when supply is lower or higher than the underlying demand.

Some of the price effects that may occur within markets may be summarised in the following points.

Prices set by supply and demand.	The price of an item in a market is set by the available supply, and the demand for the item. High supply and low demand may result in low prices, while low supply and high demand may result in high prices.
Changes in supply	Supply may adjust over time, increasing following periods of high prices and reducing following periods of low prices.
Cost of production	Changes in supply may lead to market prices adjusting to levels that reflect the underlying demand for the product, and the costs of creating the product.
Equilibrium	With demand and supply levels constantly changing, a stable price level may never exist, with demand, supply and prices all changing as time passes.

Random walks

The prices of goods that are traded in markets may often follow a process known as a "random walk".

In this process, each new price is based on a random value.

The average of the new price is centred on the previous price, in contrast to many random data series, in which the data may be centred on a constant average point.

5.6.15.5. Efficient markets

In some cases, changes in price levels and volumes can be predicted.

This generally applies to the sale of commodities that cannot be easily stored, and where the supply may vary according to the time of the year.

For example, the price of wheat may be low following the harvest season, when a large volume of wheat may be available, and may rise through the year until the next harvest season.

(** check commodity price examples)

However, in cases where a commodity can be easily stored, or where the supply is not dependant on external conditions, a different effect may apply.

For example, if wheat could be easily stored in large volumes, then an investor may purchase the wheat when the price was low, store the wheat, and then sell the wheat when the price was high.

In attempting this action, the buying activity may increase the price during the low periods, and the selling activity may push the price down during the high periods.

Conducting the speculative activity may have the effect of smoothing the price, and lead to a stable price through the whole period.

This may have several effects.

The price would be stable, and future prices could not be predicted according to a regular cycle or pattern.

Also, a consistent profit or loss would not be possible, as an accurate prediction could not be made as to whether the future price would be higher or lower.

This effect is known as an “efficient market”.

Within an efficient market, the current market price may settle to a level that incorporates the current information about future conditions.

Any changes to prices would occur as a result of unexpected events occurring, with an equal chance of positive or negative events.

An efficient market has the following characteristics

1. Price changes occur on a random basis.
2. Future prices cannot be predicted.
3. Profit or loss on a consistent, long-term basis due to speculation is not possible.

However, although profit or loss may not be possible from predicting future prices, the market items may still involve an average long-term return.

For example, shares and property could have an average long term return that was a positive value, even in the case of a perfectly efficient market, which would make any particular prediction over a specific time frame impossible.

A considerable volume of research has been conducted to investigate whether large scale markets, such as the stock market, are efficient markets or not.

Although results may vary, the general conclusion of these studies has been that large scale, liquid markets such as the stock and bond markets in developed economies have a very high level of efficiency.

In these situations, the potential value from speculation may be limited in comparison to the levels of volatility.

Market efficiency may have a number of implications for a business operation.

The primary implication of this may be that attempting to predict the future prices of market traded commodities may not be worthwhile within general business activity.

In these cases, using risk management techniques such as futures and options to manage price risks may be a lower-risk approach that managing prices based on predictions of future price levels.

5.6.16. Economic assumptions

In developing models of future activities, such as estimating the income from a new product development, a number of assumptions may be needed.

Figures that are used in calculations are either "real" or "nominal" figures.

A nominal figure is the actual value itself, such as an interest rate.

In the context of economics and finance, a "real" figure is a nominal figure that has been adjusted for inflation.

For example, if inflation was 10% and the interest rate on a deposit was 12%, then the "real" interest rate would be 2%.

The 2% figure may represent that actual increase in value that would occur from the interest payments.

Technically, the inflation rate and the real rate should be multiplied together, not added, however an addition or subtraction may give a close approximate result for most practical levels of inflation.

Real rates are often reasonably stable, while the nominal rate may rise or fall significantly with changes in inflation.

The following figures could be used as assumptions for long-term values.

These figures approximate the values that have occurred over the last 100 years in Australia and in most other capitalist economies.

	Real Rate	Common Real Range
Economic growth	3 %	-1% to +6%
Interest rates	3 %	-1% to +5%
Inflation	3%	2% to 8%

The nominal rate, which is the rate that actually applies for a transaction, is the real rate plus the inflation rate.

For example, when inflation is 5% and real economic growth is 3%, then the nominal economic growth would be 8%.

Similarly, if real interest rates where 2%, then the interest rates for actual transactions would be around 7%.

5.7. Financial Distress

Financial distress occurs when a business enters a situation in which there is a significant chance that it will become insolvent.

Negative cash flow occurs in many business operations, such as during the development phase of a new project.

However, financial distress applies to a situation in which a business is at significant risk of insolvency.

The may occur when cash flow is negative, cash reserves are low, and no immediate solution to the problem is available or is likely to occur in the short term.

5.7.1. Insolvency

Insolvency occurs when a business is unable to make a payment that is due.

When a business becomes insolvent, a creditor may make an application to a court to have the business wound up.

When this occurs, the operations of the business are discontinued, the assets are sold and the debts are repaid.

Any excess funds that remain after the repayment of the debts are distributed to the shareholders.

If there are insufficient funds remaining to repay all the debts, the remaining debts are cancelled in the case of a company.

In the case of a sole trader operating in a personal name, a partnership, or director's guarantees, the individuals may become liable to repay the remaining debts from personal assets.

Insolvency does not occur purely because of negative cash flow.

However, negative cash flow is an unsustainable situation, and will eventually result in the net assets falling to zero and insolvency occurring if it continues for an extended period of time.

Likewise, negative equity does not imply insolvency, although this generally indicates a serious problem with the financial position of the business.

5.7.2. Causes of financial distress

Financial distress can be caused by a wide range of circumstances.

In some cases, a single event may be the cause of a financial distress situation.

For example, a facility may be destroyed by fire, leading to an inability to continue production.

Long delays may occur in re-establishing production, arising from court cases or other delays that may be involved in receiving insurance settlements.

In the case of a single event, the cause of the financial distress may have already passed, and action may be focussed on surviving the immediate period without becoming insolvent, and re-establishing the business operation on a sustainable basis.

In other cases, the cause of the problem will still be current during the financial distress phase.

In these situations, action may need to be taken to address the cause of the problem, in addition to surviving the immediate situation.

Some causes of financial distress may include the following

- Unexpected external events such as a major customer discontinuing orders, cancellation of a project, fire etc.
- Lack of investment in new facilities, products and processes.
- An excessive funding burden caused by activities such as large research and development areas, a large development project, or some other operation consuming funds that cannot be supported by the operations of the business.
- Capital starvation, where expenses have been cut to unsustainably low levels, and funds are not available for essential items such as computer equipment and information supplies.
- Continuing to operate loss-making facilities and operations that cannot be profitable due to their structure and should be closed.
- Poor management of the operations, structures and costs of the business.
- Ineffective marketing activities.

- Low levels of economic activity.

5.7.3. Termination of financial distress

A period of financial distress may end when cash flow becomes positive, or failing that, when the business becomes insolvent and is liquidated.

The end of a period of financial distress may occur in some of the following circumstances.

- General trading conditions improve, such as the end of a major economic recession.
- Additional equity is raised from investors to repay debt.
- A major cash inflow occurs, such as a payment for a completed project.
- Changes to the business operations result in net cash flow turning around and becoming positive.
- Volatility in input or output prices results in positive cash flow being restored.

The aim of managing a business during a period of financial distress is to ensure that the business keeps operating, that it remains solvent and pays debts as they are due, and that it is able to avoid insolvency long enough for the period of negative cash flow to end.

If the negative cash flow is due to permanent causes, rather than a temporary issue, this may also require a restructure of the business to create a sustainable operation before insolvency occurred.

5.7.4. Crisis Accounts

Crisis accounts could be used as a term to describe the financial statements needed to manage a business that is operating under conditions of financial distress.

Crisis accounts are very different from standard financial statements.

One approach to preparing crisis accounts could involve the following approach.

- Credit facilities available at call, such as unused overdraft amounts, are included with cash balances as available cash levels.
- Assets are valued at realisable value, which is the cash amount that could be raised from selling the asset, less any transaction costs.
- Assets than cannot be sold are not included.
- Accrual accounting is not used, and cash balances record physical cash levels, rather than income booked from sales where payment has not been received.
- Non-cash expenses such as depreciation are not included.
- All major pending cash flows are recognised, including capital amounts such as inflows from asset sales.
- Liquid assets, such as shares, are listed separately when the cash inflow from selling the asset could be received within a short period of time, such as a few weeks

The following example presents one possible format for a set of crisis accounts

	Amount	Months Remaining
Cash		
Cash deposits	10	
Unused overdraft facilities	5	
Total Cash	15	1.8
Liquid Assets		
Shares	25	
Total cash & liquid assets	40	5
Saleable Assets		
Equipment	55	
Large stock items	5	
Vehicles	25	
Total Saleable Assets	85	
Total cash, liquid assets, & saleable assets	125	15
Monthly cash inflow	75	
Monthly cash outflow	83	
Net cash flow	- 8	
Income booked but not received	25	
Expenses due but not paid	15	

Major upcoming cash flows

Inflows

Settlement of building sale	85	23 February

Outflows

Interest payment on bonds	55	17 April

All assets would be sold up to the final insolvency date, in the order of their importance to the business operation.

Assets that could not be replaced to allow continued business operation would not be included as saleable assets.

For example, a licence to operate within the industry, and specialised production facilities, would not be included as saleable assets.

The order of sale may depend on the size of the item, the net cash that could be raised if another item had to be purchased to replace it, and the impact on business operations.

For example, the licence to operate would be the last item to be sold, as this would then lead to the closure of the business.

5.7.5. Reducing cash outflows

In the case of negative cash flow, action may be needed to avoid insolvency occurring unless the negative cash flow corresponds to a short-term situation, such as the development phase of a project.

Steps that can be taken to reduce negative cash flow, or to restore positive cash flow, may include some of the following items.

- Raising equity
- Increasing income
- Selling assets
- Postposing expenses
- Reducing expenses

5.7.6. Raising equity

In a situation of financial distress, the business owners may transfer additional funds into the business from personal assets.

If this is not possible, outside investors may be sought to contribute funds to the enterprise and to stabilise the financial position.

In the case of a public company, a rights issue is often conducted to raise additional funds from the existing shareholders and the general public.

These actions may stabilise the short term position of the business.

In cases where the business is carrying an excessive level of debt, raising equity and using the funds to repay the debt may reduce interest costs and improve the business outlook.

However, in other cases, simply raising additional equity may not solve the problem that caused the original situation to occur, such as negative operating cash flow.

Also, the existing owners and other investors may be reluctant to invest more funds in a business that is consuming capital, as the additional funds may also be lost.

5.7.7. Increasing income

In most cases, there may be little direct action that can be taken to increase income in the short term.

Some alternatives may include cancelling discounts, subsidies and other benefits that are offered with products.

Where prices are below competitor's prices or are unsustainably low, raising prices may increase revenue.

A decline in the number of sales may be expected, however this may be offset by the higher income per item.

In other cases where prices are too high, reducing prices and holding a short promotional campaign may boost sales.

However, in many cases this may be unlikely to result in a large short-term increase in the value of sales, and is more likely to reduce net income.

5.7.8. Postponing expenses

Expenses such as the purchase of new equipment, research and development projects, marketing expenses and so forth could be postponed in the short term until the financial position of the company had been stabilised.

However, these expenses may be necessary for the long term survival and development of the business.

One possible scenario may be that expenses of this type had been postponed in the past, no other action was taken, and that the business is now in a far more serious position through having no viable operation going forward.

5.7.9. Reducing expenses

Aside from selling assets, reducing expenses is the other major option available to the business to postpone insolvency.

Reducing expenses has the benefit that it is a permanent change, as opposed to some of the other measures to raise cash that simply allow operation to continue for a period of time while other changes are made.

In the case of reduced expenses, this would also reduce the rate of decline in the net assets of the business, in contrast to other alternatives which may extend the period of time until insolvency through converting assets into cash.

Reducing expenses may involve reducing staff numbers, moving to alterative premises, closing uneconomic production facilities, and finding alternative sources for raw materials and other supplies.

In cases were an internal area is too large to be sustained by the current business operations, such as a large development project or a large research area, a project could be discontinued or an internal area could be reduced in size.

5.7.10. Factoring

Money that is due for payment from customers is an asset.

This is due to the fact that payments may be received on future dates from accounts that are due.

This asset is generally recorded in the balance sheet as “accounts receivable” or “trade creditors”.

A factor service is a business that purchases accounts receivable from other businesses, and collects the income directly.

A discount is applied to cover bad debts, interest due to the delay in the accounts becoming due, and the factor’s profit margin.

The factor makes an immediate payment to the business, and then collects the accounts as they become due.

In a financial distress situation, this method may allow the business to raise cash on short notice if there is a significant value of accounts due from customers.

5.7.11. Selling assets

Selling assets may be the major option available to a business to raise sums of cash in a short period of time.

This may not solve the underlying problem that caused the situation to develop, however it may allow the business to continue operating for the short term, even under conditions of negative cash flow.

This may provide time to allow for a temporary period of low income to pass, to allow for developing new products and customer accounts, and to allow time to make structural changes within the business to create a sustainable business operation.

Assets that are not currently used for business operations could be directly sold.

Assets that were used within business operations could be sold, and alternative assets could be purchased or leased.

A lease arrangement would allow the entire proceeds of the sale to be held as a cash reserve.

However, problems may arise with lessors refusing to lease equipment due to the poor financial position of the business.

Alternatively, assets could be sold and lower-cost assets could be purchased to allow the business operation to continue in the medium term.

Another alternative may involve a sale-and-leaseback arrangement, which is sometimes used with commercial properties.

In this arrangement, the business sells the property, but remains in the building as a tenant.

A standard lease is signed with the purchaser of the building.

This arrangement allows the business to raise a lump sum of cash without disturbing the current operations.

5.7.12. Cash & Asset levels

Insolvency occurs due to a lack of cash, not due to a lack of assets.

A business may have substantial assets, and yet still become insolvent if there is insufficient cash available to make payments that are due.

This may be a potential problem in a high-growth situation.

A large amount of materials may have been purchased.

A large number of products may have been sold to customers on credit terms, or work may have been billed to clients.

In cases where income had not yet been received from customers, however expenses were high, a financial distress situation may develop due to the timing of inflows and outflows, and low reserves of cash.

The risk of this situation developing may be reduced by offering limited credit terms to customers, and by managing cash levels and cash flow timing as a separate issue from the accounting income and expense records.

5.7.13. Advance action

Many of the steps that may be taken to postpone or avoid insolvency may only be available early in the period of financial distress, rather than towards the end of the period.

For example, a lower-cost replacement machine may be available to replace an existing machine, with delivery available three months after payment was made.

If cash levels were sufficiently high to purchase the alternative machine, then the new machine could be purchased, and the old machine could be sold when the new machine arrived.

However, towards the end of the period, cash reserves may be too low to allow for this option.

In this case, the old machine may have to be sold first, to raise cash to purchase the replacement machine, and this may lead to a three month break in production.

Similar issues may occur in many other transactions.

Actions that could be taken early in the financial distress period may not be practical when cash levels become low or when time periods become short.

As another example, the time delay involved between making a decision to sell a major physical asset, and actually receiving the proceeds from the sale, may involve many months.

If this step is postponed until late in the period, the cash may arrive after the insolvency had already occurred, and the business operation had already closed.

To avoid these risks, action may need to be taken early in a financial distress period, while alternatives are still available.

5.7.14. Conserving cash balances

In general, in a situation of financial distress, cash balances should be preserved wherever possible.

Dividends are usually cancelled in these circumstances.

Debt should not be repaid until it is clear that the company is in a secure position.

Once debt has been repaid, it may not be possible to re-draw the funds due to the financial position of the business.

Although there may be a slight loss due to the difference in interest rates on the debt and the cash holdings, this may be minor in relation to the need to have the cash available to meet expenses as they occur.

5.7.15. Future directions

When the short-term position of the company has been stabilised, action may be needed to ensure the long-term survival of the business.

Many of the financial distress options can only be used once.

If the situation reoccurs, these options may not be available and the company may be liquidated.

The steps taken to postpone insolvency may provide a short-term window of opportunity to restructure the business into a viable operation.

If action is not taken during this period, then insolvency may become inevitable.

Action may involve a complete review of the business, including the products it produces, the markets it operates in, the financial structure of the business, and the size and structure of expenses.

The aim from this exercise would be to create a business operation that was sustainable on a long term basis.

The opportunity for drastic change may still be very limited.

However, determining a clear direction towards a sustainable structure may be sufficient to prevent insolvency occurring and to ensure a viable future for the business.

5.8. Floating a company

“Floating” a company involves selling the shares of the company to a large number of investors from the general public.

“Listing” a company involves registering the shares for trading through a stock exchange.

These two steps are generally performed as a single process, although there are a small number of widely-held public companies in which the shares are not listed for trading on a stock exchange

5.8.1. Reasons for floating

There are two main reasons why a company may be floated.

The business owners may wish to exit the business.

This may occur in the case of retirement, or when the business owner or owners wish to withdraw from the business operation for one reason or another.

Also, companies are floated in order to obtain easier access to equity capital.

Sourcing additional equity funds in a private business operation may be a difficult task.

In these situations, a new investor must be personally located.

Also, this step may have implications for the control and development of the business.

Rasing equity by directly locating potential investors generally becomes impractical once a company reaches a certain size.

In contrast to direct investment, raising equity for a listed public company is a relatively straightforward process

A “rights issue” may be conducted, offering existing shareholders the opportunity to subscribe additional funds for new shares in the company.

These rights may often be sold, and other investors could purchase the rights and subscribe for the shares.

The cash that is subscribed becomes part of the company's assets, and is available for purposes such as expanding the business operation, or constructing new facilities.

This step generally has few implications for the control and operation of the business.

Both before and after an equity raising, the shares are generally spread between a large number of investors.

5.8.2. Control structures after a float

In cases where the float is conducted to enable easier access to capital, the original business owner may remain in the position of chief executive and continue to operate the business.

In this case, the original business owner would generally retain a substantial portion of the shares, although this would generally represent less than 50% of the company.

In other cases, the business owner may withdraw from active involvement in the business, and may retain a substantial portion of the shares as a passive investment, or may sell the entire company through the float.

5.8.3. The float and listing process

Floating a company is a major process, and may involve considerable expense.

As a general rule, a business may need to have revenues of several million dollars per year in order for floating to be a practical option.

However, floating may be a natural step in the development of a business, and most large business enterprises are listed companies.

The float process is generally managed by an investment bank or stock broker.

The party managing the float may advise on the pricing of the shares, assist in the preparation of a prospectus, contact potential investors, and provide an underwriting service for the float.

Underwriting a float involves an agreement to purchase part of the shares in the company directly, if insufficient applications are received from the general public.

A fee may be charged for the underwriting service, the shares may be purchased at a discount, and a sub-underwriting arrangement may be used with major institutional investors to transfer shares to investors if the float is undersubscribed.

The float process involves preparing a document known as a “prospectus”.

A prospectus includes a full set of audited accounts, and a detailed description of the business.

The process for floating and listing a company is regulated by a detailed set of regulations in the commercial law, which includes regulations for the steps involved in the process, the time frames, and information that may be required, such as a prospectus.

The prospectus must generally be lodged with a government regulator and a stock exchange, if applicable.

Copies of the prospectus may be distributed to the public, and brokers may distribute prospectuses to their clients.

The sale offer then remains open for a period of time.

Investors wishing to invest in the company may complete the application form in the prospectus, and send the application form together with a cheque to the party that is managing the float.

At the end of the offer period, the float may be oversubscribed or undersubscribed.

If too many applications have been received, then each investor may receive only part of the share allocation that they requested, and excess money would be refunded.

If insufficient applications were received, then the float may be cancelled, or the investment bank or stock broker may purchase the additional shares directly.

The shares may generally be listed for trading on a stock exchange a short time after the offer closes.

5.9. Business start-ups

5.9.1. The decision to start a business

Every time an individual buys or sells something, they are conducting a commercial transaction.

Being employed as an employee or a contractor is a commercial arrangement between the individual and the employer.

Each person in this situation could be considered to be running their own personal business.

However, although these arrangements are all commercial transactions, they are not usually considered businesses in the traditional sense.

Starting a business is not for everyone.

Operating a business may involve great uncertainty about the future.

Also, running a business may involve a considerable input of personal energy and resources.

5.9.2. Risks with a start-up enterprise

Although a new business enterprise may offer many possibilities, a realistic outlook may also be needed.

In some cases, businesses produce strong positive cash flows over long periods of time, and accumulate significant assets.

However, this is a comparatively rare situation.

A business may record a period of strong cash flow, followed by long periods of lean operation with limited sales and negative cash flow.

When a successful business operation does develop, this is usually the result of reinvesting considerable efforts over a long period of time.

Great efforts may also be extended without benefits flowing through.

This may be due to external events that are beyond the control of the business, or it may be due to mis-directed efforts, such as developing a product for which there is no real underlying demand.

A large proportion of attempted business start-ups are unsuccessful.

For example, by some estimates, 80% of new restaurants that are opened are unsuccessful and eventually close.

Unsuccessful operations may continue for a period of time and then close, or they may operate for long periods, gradually consuming the personal assets and resources of the business operator.

In other situations, a business may operate at a permanent subsistence level.

For example, one estimate holds that if the business operators of small enterprises were to draw a typical salary from the business, up to half of all small enterprises would become insolvent.

In these cases, the business becomes a way of earning income directly from personal actions, but in a different form to other approaches.

In many cases, the investors in a new business enterprise must contribute their entire assets to the creation of the business in order to raise enough capital to establish the enterprise.

This is not a decision that would generally be taken lightly.

Most start-ups involve an initial period of capital expenditure and negative cash flow, meaning that the business may be certain to loose a proportion of the initial funds, however the inflow of funds from customers or clients may or may not occur.

5.9.3. Conditions for starting a business

New business ventures are sometimes formed when a person or a group of people see an opportunity to develop a product or a service, and feel that the time it right to commence a business activity.

This may occur with several people working in the same industry, who form a new enterprise and develop a new product or service.

In other cases, a business venture may begin as a small activity and gradually expand over time to become a full-time business.

5.9.4. Types of start-up

Start-up enterprises may fall into two categories.

Some business start-ups are funded with personal resources, and possibly with investments from relatives and associates.

Other start-ups may involve larger sums of capital than the funds that may be sourced from individual resources.

Funds for a start-up of this type may be raised in a public float, or funds may be invested by an existing business in a new enterprise.

5.9.5. Funding a start-up

5.9.5.1. Funding a personal start-up

Obtaining funding may be a difficult part of the business start-up process.

In some cases an individual may have personal resources and be able to fund a start-up business directly.

Other sources of funding may include bank loans, taken out as personal financing as an individual.

In some cases, relatives or associates may invest in the enterprise either through a loan, or through an equity investment.

In the case of equity investment, the investors may take an active part in managing the enterprise, or they may be passive investors and not become involved in the planning and management of the enterprise.

Personal funding may occur in the formation of businesses such as retail shops, restaurants, small manufacturing operations, and service businesses.

5.9.5.2. Funding a larger start-up

A larger start-up may involve raising a large sum of capital, that cannot be raised directly from individual investors.

There may be several possible sources for funds in these situations.

Prospectus issues

The business operators may form a company, issue a prospectus, and attempt to raise money directly from the public.

This process may be practical in some of the following circumstances.

- Commencing operations in a rapidly expanding industry.
- Commencing operations during boom conditions of activity.
- Where the parties forming the business have substantial experience and profile within an industry.
- Where the new business operation has access to a new invention or technology.

Larger scale start-ups sometimes occur in high growth industries, particularly during boom times.

Venture capital

Another source of funding is known as venture capital.

This funding is provided by investment funds that specialise in making direct equity investments in private business operations.

However, venture capital is most often invested in businesses that have already established a successful operation, and are seeking funds in order to expand in the size of the business activity.

Existing businesses

Another possible source of funding may come from existing business operations.

For example, the business operators may have worked within an industry for an extended period of time.

Through associations with individuals and organisations within the industry, the business operators may be able to locate an organisation that is interested in funding a start-up operation, or is willing to provide capital to invest in a joint venture arrangement.

In these cases, a strong case may need to be made to obtain commercial start-up funding for a new enterprise.

For example, the group may have developed some unique technology, and may then seek funding to commercialise the technology.

5.9.5.3. Business-funded start-ups

Existing businesses may also create start-up operations in certain circumstances.

This may occur when the business decides to enter a completely new market.

For example, a mining company may decide to establish a business in a high-growth industry such as data services.

In these cases, an independent operation from the existing business may be established.

The existing business may provide funding, either as a lump sum of capital, or as an ongoing cash flow until the new operation reaches a break-even position.

A large operation may be established in a short space of time, including creating an entire organisational structure, hiring employees, and developing products and a marketing plan.

A start-up may place a considerable drain on the resources of the business, and may or may not be successful.

5.9.6. The business concept

Starting a business may involve developing a new product or service, or it may involve commencing a traditional business operation within an established industry.

New ideas may particularly apply to situations where the business owners have worked within an industry for an extended period of time, and have seen the need for a product or service that is not currently available.

A possible benefit of this situation is that there may be a strong and immediate demand for the product or service once it is developed and launched.

However, they may also be a range of disadvantages with commencing a business based on a new idea.

Supplies may not be readily available, new equipment and manufacturing processes may need to be developed, and an extended period of time may be involved before the product or service is available in sustainable volumes.

Sales volumes of the product may be difficult to estimate, as there may be no established sales pattern to use as a frame of reference.

Although in some cases the demand for the product may be immediate, in other cases a long delay may be involved in developing sustainable sales volumes, due to the need for potential customers to become familiar with the product.

Establishing a business as a traditional operation may also have advantages and disadvantages as an approach to commencing a business operation.

Supplies may be readily available, techniques for producing the product may be well established, and it may be possible to establish a fully operational business within a short period of time.

However, most industries operate on a competitive basis, with prices falling to the lowest sustainable levels, based on the underlying costs involved in operating the business activity.

In this situation, it may be difficult for new businesses to establish a profitable and expanding operation.

The level of prices may be determined by the costs and pricing of experienced operators with established facilities and customer bases.

In offering similar price levels, a new business may have insufficient net cash flow to invest in new developments, marketing programs, and so on.

In general, a higher level of profit and cash flow may be needed to expand a business than to maintain an existing level of business activity.

However, establishing a traditional business may have the advantage that an existing market for the product or service may be active.

Establishing a traditional operation may be particularly relevant within industries where each business services a limited geographic area, such as retail operations.

5.9.7. Testing a business concept

Starting a new business may be a large step.

This may involve the business owners contributing a large proportion of their assets, and a considerable amount of energy and effort, in attempting to establish a business enterprise.

In the case of a failed start-up attempt, a large proportion of the business owner's assets may be lost.

Also, a great deal of time and effort may be spent on a process that may eventually be abandoned, due to insolvency, or due to the income from the enterprise being insufficient to cover costs and maintain a sustainable operation.

Where possible, every effort should generally be made to ensure that the business has a reasonable chance of success, before the decision is made to attempt the establishment process.

A number of steps may be taken to test the concept on which the business will be built.

In the case of physical products, samples could be produced and distributed to potential customers, before major equipment purchases were made and premises were rented.

This may allow the market demand for the product to be tested, before major expenses were incurred.

Although discussions with potential customers and clients may be useful in some circumstances, actually supplying the product or service may be necessary in order to determine the sustainable interest in the product.

In some cases, small volumes of the product or service could be produced, to gauge market interest, to determine price levels that could be sustained, and to solve teething problems.

This may initially be done on a loss-making basis, with products being sold at their target final price, rather than prices being determined by costs.

In the case of a successful flow of sales, a decision may be made to attempt to establish the full business operation.

5.9.8. Developing a business plan

Several major steps may be involved in forming a new enterprise.

First, there must be an idea, direction or concept behind the enterprise.

This may simply be a desire to operate a traditional business of one form or another, or it may be a response to an opportunity for a new product or service that is missing from an industry and may meet with a strong demand.

Commencing a business activity may involve initially developing a business plan.

The business plan may include some of the following information:

- The idea, purpose, product or service that the business enterprise will be built on.
- A time frame for each stage of the business development, including forming the enterprise, developing sample products, a target date to commence production or supplying services, and a target date for a break-even cash flow.

  These time periods may be fairly general.

One example may be three months to form the enterprise, such as renting office space and arranging registrations, three months producing sample products and demonstrating services, actual production to commence in six month's time, and break-even cash flow to occur in eighteen month's time.

- A budget for all expenses, up until the target date of break-even cash flow.
- A funding plan, such as a list of amounts to be contributed by each party that will be investing funds in the enterprise.
- A long-term direction, such as a broad direction for the business to take over the next five years.
- A plan for decision-making, control of the business, and resolving disputes. For example, an agreement may be made to form a company structure, with each full-time participant in the enterprise being a director of the company.
- A plan for exiting the business if the venture is not successful or if one of the participants wishes to withdraw from the enterprise.

Appendix A, beginning on page 1080 contains an example of a business plan for a start-up enterprise.

The issues involved in operating the business may need to be brought forward and discussed openly before the enterprise commences.

This process may continue until the issues have been fully worked through and all the possible scenarios have been considered.

Business ventures may degenerate into bitter struggles and disagreements.

Once a dispute or a problem has arisen, it may be too late for discussions to be used as a way of reaching agreement as to the major direction of the business, or the methods to be used for operating the business.

5.9.9. Initial phase

During the initial stage of the business, cash flow may be negative.

Negative cash flow may continue for as long as several years in some cases.

In this situation, the cash flowing out of the business in expenses and capital purchases may be larger than any income received from customers or clients.

Several options may exist in terms of personal income for the business operators during this time.

In some cases it may be feasible for the business operators to live from personal resources, using either personal assets or income from other family members.

In other cases, a full-time or part time job may be retained during the initial phase, in addition to conducting the business operations.

Another option may be to draw a salary from the start-up funds of the enterprise.

This may require a significantly larger capital investment than the funds needed to purchase office equipment or raw materials.

In this funding was available, then the initial capital would be raised at the beginning of the enterprise, and the expense budget would include salaries for the business operators, which would be draw from the capital investment.

5.9.10. Commencing operations

Flexibility and steady forward progress may be important during the initial period.

In the case of negative cash flow, the assets of the business steadily decline.

This places the business on a limited time frame, until the cash reserves are exhausted and the business becomes insolvent.

Steady forward progress may be necessary during this time to ensure that a sustainable operation is created before the available funds fall to zero.

Initial ideas may turn out to be impractical, and significant changes in direction may be needed.

During this period the situation may be very fluid, and the goal may be to find a way to establish a viable business operation that would produce produces or services that met with a demand from customers.

5.9.11. Developing a client base

When production facilities have been developed and the business operation has been formed, the next step may involve a major marketing phase.

This may involve directing the resources of the business towards marketing activities, to develop an established customer or client base, and to develop a sustainable level of sales.

Marketing activities may include approaching potential clients, advertising, and producing promotional material to support the establishment of a client or customer base.

5.9.12. Break-even cash flow

If the initial marketing phase was successful, a growth in sales may result in a break-even cash flow occurring, assuming that prices had been set to a level that was sufficient to cover costs and generate a profit.

Passing the break-even cash flow stage may be a major milestone.

In the case of positive cash flow, although the future may be uncertain, a fixed time frame until insolvency does not exist.

Positive cash flow may then allow the business to develop with a steady income and possibly opportunities for future growth

Technically, non-cash expenses such as depreciation are included in determining a break-even profit level.

For example, a business may have positive cash flow, but still involve a decline in net assets and an unsustainable operation if the depreciation of equipment is larger than the cash inflow.

In practice, however, crossing the point of positive cash flow may be the major step in ensuring a viable operation for the business in the medium and long term.

5.9.13. Burn rates and negative cash flow

A typical pattern within a boom period in a high growth industry may involve an individual or small group raising a sum of capital through a public float, hiring employees and purchasing equipment, and then attempting to create products and build a client base.

This situation may lead to high negative cash flows, with the original capital only supporting the operations for a limited period of time.

This pattern may also be common in the mining industry, where capital may be raised by small companies, with geological surveys being conducted in an attempt to locate an ore body for mining.

The level of negative cash flow is known as the burn rate.

The number of months remaining until the available capital is consumed can be calculated using the following formula:

$$\text{months remaining} = \frac{\text{available capital}}{\text{net monthly outflow}}$$

For example, an operation with a net cash outflow of $5 per month and $58 of available capital may have the following period of time remaining until the capital was exhausted.

$$\text{months remaining} = \frac{58}{5}$$

$$= 11.6 \text{ months}$$

In this example, the business would be able to continue operating for another eleven months at the current rate of cash outflow.

If the burn rate continued at this level for the full period, the business may attempt to raise additional capital, otherwise it would be unable to continue operating and operations would cease.

In the case of start-ups during boom times, it is common for a company to raise additional capital from investors several times before reaching a break-even cash flow position.

Capital raisings may be separated by time periods ranging from six months to several years in these cases.

However, in the case of a start-up funded by personal resources, this option may not be available, and a single opportunity may exist to establish a positive cash flow operation.

5.10. Valuation

A Valuation process may be used to estimate the value of an asset.

Valuations may be used for some of the following purposes.

- Preparing a balance sheet.
- Assessing an asset that will be used as security for a bank loan.
- Determining a sale price for an asset.
- Determining whether to purchase an asset that is offered for sale.

Fundamentally, the value of an asset may be based on the income that could be received from the asset.

This may involve a sale price in the case of selling the asset, or a future income stream in the case of some intangible assets such as a business brand name.

5.10.1. Types of value

Different values may be placed on an asset in different circumstances.

This may include some of the following types of value.

Market value

The market value of an asset is the price that could be received if the item was offered for sale in an open market.

In this respect, the value of an asset is the amount that someone else would be willing to pay to purchase it.

Market value is the value that is used in most circumstances, such as when deciding whether to buy or sell an asset, and for the purposes of security for lending purposes.

Operational value

The operational value of an asset is the value of the asset within the business operations.

This may involve the future income that may be derived from the asset.

An asset may have an operational value to the business that may be different from its market value.

For example, partly finished goods may have a significant value to the business, particularly for large items of equipment.

In the course of normal operations, partly finished goods would be completed and sold to generate income for the business.

However, the market value of a partly completed item of equipment may be close to zero.

Book value

Book value is the value that is recorded in the balance sheet for an asset.

Traditionally, accounting is not directly concerned with market values.

For example, a machine may be purchased for a price of $100, and have a useful life of five years.

Using straight-line depreciation, this would be recorded with a book value of $80 at the end of the first year, $60 at the end of the second year, then $40, $20, and finally zero at the end of the fifth year.

The depreciation approach is a method of allocating the cost of the equipment over the useful life of the equipment.

This allows the cost in each period to be matched to the income produced in the period.

However, the book value that is recorded in the balance sheet may not match the market value of the equipment.

In cases where the rate of depreciation is approximately equal to the decline in the market value of the equipment, the book value may be similar to the market value.

In other cases, the values may be quite different

Liquidation value

Liquidation value is the value that could be received if the item was sold.

This is a similar concept to market value, although the term may be used for items such as stock which would not normally be sold directly, and would not be classified as having a market value.

Also, in the case of some large items, the value that could be realised from a sale may not match the potential value of the sale of similar items.

For example, a large block of shares that was held by the original business owners may be valued using the current share price.

However, to sell the entire block, a broker may need to locate institutional investors who were prepared to purchase large parcels of the shares, and a discount may be required to enable a transaction to go through.

In the case of selling a small part of the holding, however, the full market price may be received.

A similar problem may arise with the sale of large commercial office buildings.

The liquidation value includes the penalty or discount that would be required to create a particular transaction, while the market value measures the sale value of similar items.

Some assets may have a value to the business, but cannot be sold.

For example, the excess price paid above the net asset value for purchasing a business is recorded in the balance sheet as an asset, on the basis that the excess price would be paid for some future benefit to the business.

However, this is an intangible asset that has no benefit for other parties and could not be sold.

Other assets may cease to have a value if the business is liquidated.

A "future income tax benefit" and tax losses from previous years may fall into this category.

These items would be beneficial to the business in future years if operations continued, however they have no value in the event of a liquidation.

Realisable value

The realisable value represents the cash that could be raised from selling the asset.

This value is based on the liquidation value of the asset, being the market value of the asset less the discount that may be involved in conducting a large transaction at short notice.

However, the realisable value also includes any transaction costs that may be involved in conducting the sale process.

5.10.1.1. Summary of valuation figures

Market value	The sale price that an asset may receive in an open market.
Operational value	The value of an asset to the business, in terms of the income that could be received by the business due to the asset.
Book value	The accounting record of the value of an asset, based on allocating the cost of the asset across its useful working life.
Liquidation value	The sale price of an asset, less any loss due to the effect of trading a large asset within a short period of time.
Realisable value	The value of the cash that could be raised from selling the asset, based on the market price, less a discount to enable a transaction to occur, less the transaction costs.

5.10.2. Types of asset

Valuations may be performed on properties, businesses, projects, production facilities, brand names, patents, and almost anything that can be bought, sold, or may result in future income to the business.

5.10.3. Obtaining a valuation

In some cases, a estimate of the value of an asset may be determined from recent sales of similar items, or by performing a calculation based on a valuation multiple.

Valuations are also performed by specialist valuation firms.

Valuations are available for properties of all kinds, for businesses, and for intangible assets such as brand names.

Valuations may be cost-effective and may be an important part of purchasing a property or a business.

Valuations are frequently required by lenders such as banks, prior to accepting an asset as security for a loan.

5.10.4. Valuation Methods

5.10.4.1. Market Traded Value

In some cases, assets may trade in high volumes, with many assets of the same type being traded.

This may apply to shares, commodities such as silver, and any other item that is sold on a frequent basis.

In these cases, a valuation may be based on the price of the most recent trade.

When a “market price” quote appears in documentation, this generally relates to the price of the last trade that was executed.

In the case of assets with low turnover, if a significant period of time has passed since the last trade, the asset maybe valued at the current bid price, rather than the last sale price.

However, in some cases the bid price may not be an accurate reflection of market value.

A low bid may be posted on the small chance of the bid being filled, or to attract offers to initiate a bid-offer move towards an execution price.

5.10.4.2. Net Asset Value

In the case of valuing a business, the assets of the business may be individually valued using a range of valuation approaches.

The total value of the assets, less the amount of outstanding debts, may then represent the net assets of the business.

The net asset figure may be used as a benchmark for determining a value for the business.

Net asset values may also be used in cases such as investment unit trusts.

Some transactions may be conducted with the price being equal to the net asset value.

This situation may occur when the assets of the business may be substantial, and the business may not have significant operations that may add a goodwill component from on-going operations to the business value.

A net asset approach may also be used in the case of small enterprises, such as when the previous business owner may have performed a significant proportion of the work in the business activity, or where the business may conduct individual sales to a large range of customers, and a significant goodwill value from established operations may not exist.

In the case of some loss-making and poorly structure operations, or assets in poor condition, a business may be valued at a discount to the net asset value.

In the case of a stable and successful business operation, a value may be estimated as a premium to the net asset value, such as a 20% premium to the value of the net assets.

A business may also be sold at a premium to the net asset figure in cases where the business activity may have a high expected or potential growth rate.

5.10.4.3. Net Present Value

A Net Present Value or Discount Cash flow Analysis determines a valuation from the future cash flows that could be generated from the asset.

For example, a property may return a net income from rent minus expenses, while an item of equipment may be used to produce income, less the costs of maintenance and depreciation.

The section beginning on page 734 contains details of the calculations that may be involved in determining a net present value figure.

5.10.4.3.1. Calculating a net present value

As an example, a piece of equipment may have a life span of ten years, and may return a net income after expenses of $10 per year.

Using a discount rate of 12%, the value of this item could be determined using the annuity formula

$$\text{net present value} = \text{payment} \times \frac{1-(1+y)^{-n}}{y}$$

$$= 10 \times \frac{1-(1+0.12)^{-10}}{0.12}$$

$$= \$57$$

In the case of a perpetual income, such as income from a rental property, the net present value becomes a simple multiple of the interest rate, using the perpetual annuity formula.

For example, a property may return a net income after expenses of $20 per year.

Assuming a discount rate of 12%, the value of the property could be calculated using the following example.

$$\text{net persent value} = \frac{\text{amount}}{y}$$

$$= \frac{20}{0.12}$$

$$= \$167$$

When a range of different cash flows may be involved, such as a development project, the net present value can be determined by calculating the present value of each individual cash flow, and summing the individual present values to determine a total net value for the asset.

A net present value approach may be particularly useful for assets that cannot be directly compared to similar assets to estimate values, such as development projects.

Net present values may be used for valuing project cash flows, businesses, and commercial properties.

The two key inputs to a net present value calculation are the estimates of future income, and the discount rate that is used.

5.10.4.3.2. Estimating future income

In some cases the future income may be estimated with reasonable accuracy.

This may occur with long-term property leases, and infrastructure assets such as toll roads.

In other cases, such as launching a new product, it may not be possible to accurately estimate the likely future income.

In these situations, several valuations may be calculated.

For example, best-case, average-case and worst-case estimates of the income from a new product may be made, and three separate valuations of the project may be calculated.

In this case, and average value of several valuation scenarios could be used, or several values could be used separately in the planning process.

5.10.4.3.3. Discount rates

The choice of discount rate may depend on the current level of interest rates, and the risk of the project.

An additional amount may be added to a base interest rate to allow for the project risk, with a higher risk premium being added for high risk projects.

A high discount rate reduces the value of the project.

This reflects the fact that the future cash flows may not occur, and even if they do, there may be a penalty involved in the fact that the future cash flows are uncertain, and this may prevent other actions being taken if there is a high level of uncertainty involved in the likely value of the future cash flows.

The choice of a discount rate may have a significant impact on the valuation, particularly for long-term cash flows.

Risk premiums may be as low at 1% or 2% for very stable cash flows, or as high as 15% or 20% for risky projects.

For example, a medium risk project may be allocated a risk premium of 6%, during a time when interest rates are around the 8% level.

The rate used in the calculation then would be:

Base rate	8%
Risk premium	6%
Discount rate used	14%

The base interest rate may be chosen from a low-risk rate, such as a bank reference rate or a government bond rate.

Discount rates are discussed in the section beginning on page 773.

5.10.4.4. Comparative Valuation

Comparative valuation involves determining a value based on recent sales of similar items.

This method is commonly used in valuing properties.

Comparative valuation is also used to value some businesses.

This may apply in the case of small enterprises where there may be a number of sales of businesses of similar size and operation, and in the case of consolidating industries, where a large number of similar transactions may occur.

Comparative valuation requires several sales of other items, all within a recent period such as the previous few months, and all being reasonably similar to the asset being valued.

This is only practical in cases where there is a reasonable volume of sales in a range of similar items.

The market price of shares could be considered a comparative valuation in some respects, as the price that is usually quoted is actually the price of the last trade that occurred in those shares.

5.10.4.5. Valuation Multiples and Yields

5.10.4.5.1. Multiples

A valuation may be determined as a multiple of another figure, such as the expected income from the asset.

In this method, the estimated value may be calculated using the following formula.

$$\text{value} = \text{amount} \times \text{multiple}$$

For example, the expected rental income of a property may be $5 per year, with recent property sales occurring at multiples of around 8 times rental income.

In this case, the value of the property could be estimated using the following calculation.

$$\begin{aligned}\text{value} &= 5 \times 8 \\ &= \$40\end{aligned}$$

Valuation multiples may be useful in several contexts.

A valuation multiple may allow a figure such as an average long-term return, a current interest rate, or a return available on an alternative investment to be used to determine a valuation.

Also, the use of multiples may allow a wider range of asset sales to be used as references for a comparative valuation, rather than simply reviewing sales of similar assets.

Sales of assets may occur at similar multiples, even though the dollar amount of figures such as income and asset values may be different.

In some situations, such as large commercial properties and production facilities, similar assets may not exist, or the time span between sales may be large, which may limit the usefulness of a direct comparative valuation approach.

5.10.4.5.2. Determining a multiple

When a multiple is determined from other sales, the following formula can be used:

$$\text{multiple} = \frac{\text{sale value}}{\text{amount}}$$

For example, a property may have an expected rental income of $4 per year, and may sell for a price of $50.

In this case, the multiple could be determined using the following example.

$$\text{multiple} = \frac{\text{sale value}}{\text{amount}}$$

$$= \frac{50}{4}$$

$$= 12.5$$

In this example, the sale price of the asset represented a multiple of 12.5 times the expected rental income.

This calculation could be repeated for a number of recent sales.

As an example, this process may determine that recent sales of similar properties had occurred at multiples of around 12 times rental income.

In the case of a property with an expected rental income of $5 per year, a value could be estimated using the following example.

$$\begin{aligned} \text{value} &= \text{amount} \times \text{multiple} \\ &= 5 \times 12 \\ &= \$60 \end{aligned}$$

5.10.4.5.3. Values of multiples

Assets of a similar nature may trade at similar multiples.

A multiple may vary according to the stability or volatility of the income amounts and of the asset value.

Multiples may also vary with the expected growth rate of the asset value and income.

In the case of properties, for example, the multiple may depend on the expected capital growth in the property value.

In the case of businesses, the multiple may depend on the stability of the business income, and the expected or potential growth in net profit of the business.

Low multiples may apply to volatile income, and low growth expectations for future income streams and asset values.

High multiples may apply in the case of stable income streams, and in cases where the outlook may involve rising income levels or capital values for the asset.

(** growth perpetual annuity plus discount for volatility)

5.10.4.5.4. Sources of multiples

Multiples can be calculated directly from sales of assets.

Also, multiples may be published by a number of organisations, such as real estate associations, stock exchanges, and government departments.

Multiples may also be published in the business press.

For example, the “price-earnings” ratio of companies may be widely quoted.

This multiple measures the ratio of a price of a share of the company earnings per share.

5.10.4.5.5. Multiples & Yields

Multiples may be inverted to determine a percentage yield.

Yields may be easier to interpret in a practical sense than multiples, as figures such as rental yields, earnings yields and so forth may be directly compared to interest rates.

Conversions between multiples and yields may be done using the following formulas.

$$\text{multiple} = \frac{100}{\text{yield}}$$

$$\text{yield} = \frac{100}{\text{multiple}}$$

For example, a multiple of 12 times rental income could be converted into a yield using the following example

$$\text{yield} = \frac{100}{\text{multiple}}$$

$$= \frac{100}{12}$$

$= 8.3\%$

This indicates that a multiple of 12 times income corresponds to an income yield of 8.3%.

This figure represents the rental income as a percentage of the asset value, and could be compared to the interest rate on a bank deposit.

Yields and multiples are alternative methods of expressing the same set of figures.

5.10.4.5.6. Types of multiples

Valuation multiples may be used in valuing businesses.

Some multiples that may be used could include the following items

- A multiple based on earnings (net profit)
- A multiple of cash flow
- A multiple of net assets
- A multiple of the number of customers
- A multiple of sales income
- A multiple of the transaction flow that the business may manage, such as transaction sizes in a business in which the fees are based on a percentage of the transaction size.
- An industry-specific value, such as a particular value that may identify the size of an operation within a particular industry.

In some cases several multiples may be used.

A valuation could be based on the average value that was determined from each of the multiples, or the values could be incorporated with other information to estimate a value.

Valuation multiples may have a benefit in drawing attention to the key issues that may be involved in an investment.

During times of rapidly rising prices, a comparison with other sales may not highlight the underlying investment issues that may be involved with a sale or purchase of an asset at the current market price.

5.10.4.6. Rule-of-thumb valuations

Rule of thumb valuations may be useful in a number of circumstances.

This approach may involve a basic calculation, such as using a multiple of ten time earnings for a certain situation, and determining a price by multiplying the net income by ten.

Another rule of thumb approach may apply a ratio to the net assets, such as valuing a particular type of business at a 20% premium to the net asset value.

A rule-of-thumb approach may be used to place a transaction in perspective.

In some circumstances, this approach may be used to determine whether a transaction is potentially favourable, a borderline situation, of is definitely impractical, without the time and expense that may be involved in a full valuation.

A rule of thumb valuation may also be used to verify that a valuation is within a realistic range, in situations such as financial statements, internal reporting, valuations of assets for sale, and project proposals.

This may highlight situations in which optimistic projections are used, errors may exist in valuation models, or misunderstandings may exist concerning an asset or a project proposal.

5.10.5. Intangible assets

The valuation of intangible assets such as brand names and patents is a subjective area, and estimates of the value of an intangible asset may vary widely.

In some cases, a market value may be estimated for an intangible asset.

In general, however, the value placed on an intangible asset may be based on the income that the business may receive due to the asset.

For example, a patent may have a zero value unless it is used for manufacturing, providing services, or is licensed to other businesses in return for license fees.

In contrast, a patent may have a high value in the case of large scale production, such as the design of a new drug that may be distributed globally.

In cases where the asset, such as a patent, is used in the direct production and sale of a product, or when license fees are received, a net present value calculation may be performed.

In other cases, such as brand names and newspaper mastheads, valuation multiples could be used, or an estimate of the net income that is due to the asset may be made.

A valuation of an intangible asset may be required to prepare a balance sheet in cases where the asset may have significant value.

5.10.6. Structural Valuation

Structural valuation is not a traditional valuation technique.

However, this approach may have a number of advantages as a method of valuing an asset, particularly a business or a property.

5.10.6.1. Past returns

The trading history of a business may not be an accurate guide to the value and future prospects of a business for several reasons.

The new business owners may be able to improve the returns from the business through improved management, or capital investment in new equipment or products.

Also, the new operators may wish to change the business operations substantially and create a business operation that is quite different to the previous operation.

In other cases, the previous returns may not be sustainable, and future results may not match the previous trading results.

This may occur when the business had experienced a period of unusually strong trading conditions, and when the business had strong returns based on issues that were related to the previous operators, such as personal contacts of the previous business operators.

5.10.6.2. Structural valuation

An alternative approach to traditional methods may involve a review of the structure and components of the business, rather than its trading history.

This may include dynamic issues such as the current level of cash flows, as well as static issues such as the assets of the business.

A structural approach may avoid many problems with valuations based on trading history, and may focus on the future possibilities from the existing business enterprise.

For example, a valuation of a restaurant may asses the number of tables, the floor area, the value of the assets and the recent trading history.

These factors may be included in a comparative valuation with other recent sales.

However, the structural approach may focus on the operations that could be built with the available assets, rather than the previous operation.

A structural valuation may value the current business structure.

However, a structural valuation may also be based on the potential business operation that could be created from the resources of the business.

The outcome of a structural review may be an estimate of the net income that could be received from building a business operation from the available assets.

A valuation of the business may then be determined from this estimate of the potential income.

For example, a review of a business enterprise may include the following information:

Company	XYZ billboards
Operation	Designing, printing and assembling advertising billboards.
Assets	Office equipment $10, billboards $70
Customers	20 long-term contracts, previously an average of 30 casual orders per month.
Current Employees	1 receptionist, 2 graphic artists, 1 printer, 4 employees assembling and transporting billboards
Estimate of potential net income	$15 per annum
Valuation	$100. Based on a 15% yield, i.e. a multiple of 6.7 times earnings.

A structural approach to valuing a building may consider the floor space, the location, and the type of building structures existing on the property.

A valuation may then consider the possible uses for the building, the capital investment required and the rental income in each scenario, and may finally derive a valuation from these figures.

Disadvantages with structural valuation may include the fact that this approach may provide a broad valuation rather than a precise outcome.

Also, a level of knowledge of the industry may be required in order to estimate the potential income.

A structural valuation may include the following steps.

1. Asses the assets and components of the business.
2. Determine possible structures and operations.
3. Estimate the potential income from each alternative.
4. Apply a multiple to the potential net income to calculate a valuation.

The multiple that may be chosen may depend on the risk involved in the business, the growth potential, and the multiples available from alternative investments.

5.10.6.3. Issues within a structural valuation

Some of the following issues may be considered in determining a structural valuation

- Operating licenses held by the business.
- Margins within the industry that the business operates in.
- Physical assets such as land, buildings and equipment.
- Current arrangements with customers, suppliers and employees.
- The max of physical assets, and the business activities that the assets may be suitable for.
- The age and condition of the physical assets.
- Recent volumes of trade.
- Seasonal issues, and volumes of trade at various times of the year.

- Potential alternative uses for the assets and alternative business activities.
- Distribution arrangements that are currently in place for distributing the business's products.
- The size and composition of established customer or client bases.
- Trends within the industry, such as consolidation, expansion, high or low growth rates, and consolidated into a small number of operations or fragmented into many operations.
- The long-term likely volumes of trade in comparison to the recent trading results.
- The level of capital expenditure that may be involved in revitalising a business activity.

5.10.6.4. Business processes

Reviewing the structure of the business may involve a review of all current business arrangements.

This may include the current arrangements with customers, suppliers, and employees.

The business process may involve the current operations of the business, including arrangements with customers, suppliers and employees, and the on-going flow of income and expenses.

A business process may have a value that is separate from the physical assets of the business.

This could be termed the "structural value" of the business, and would be equal to the difference between the value of the assets, and the value of the business as an operating enterprise.

5.10.6.5. Takeovers and business purchases

Structural valuation may also be relevant in the case of purchasing another business.

In this case, a structural valuation process may be performed on the potential business that could be constructed from the combination of the current business activity and the target business.

In this situation, the value of the purchase may be determined from the potential value of the combined business operation, less the value of the current business operation.

5.10.7. Summary of valuation approaches

Market traded value	Estimating a market price or value from recent sales of the same asset, for example the last sale of a share or a commodity.
Net asset value	The sum of the value of the business's assets, less the debts. A premium or discount may be applied to the net asset figure to determine a business value, based on the profitability of the business, the stability of income, and the future growth potential.
Net present value	A value based on discounting the expected future cash flows from an asset to an equivalent present value.
Comparative valuation	Determining an estimated asset value based on recent sales of similar assets.
Valuation multiples & yields	Applying a multiple or yield, based on recent sales or alternative investments, to a figure such as the net profit, cash flow, net assets and so on, to calculate an estimated value for the asset.
Structural valuation	Estimating the potential net profit of the operation, based on the current structure or a potential structure, and deriving an estimate of the asset value by applying a multiple to the estimated potential net profit.
Rule-of-thumb valuation	A basic calculation, such as a value of ten times net profit, used to place potential transactions in context, and to check for errors in other valuation figures.

5.11. Methods of asset sales

The sale of an asset occurs when a property, business, project or other asset is sold.

A sale process may be handled in a variety of ways

5.11.1. Direct Offer

Under a direct offer approach, the asset may be offered for sale at a specific price.

The sale occurs when a buyer chooses to accept the offer and a transaction is conducted.

This is a simple arrangement and is often used for asset sales.

A direct offer may have a benefit in that the sale price is known in advance.

As either a buyer or a seller, the business can develop plans and budgets, check valuations, and consider future possibilities before proceeding with the transaction.

A direct offer may also avoid the possibility of a long period of negotiation, which may result in time delays, an uncertain final price, and an unfavourable outcome due to greater bargaining power by the other party.

A disadvantage with a direct offer may be that the offer may need to remain open for a period of time before a buyer appears.

Also, if the item is offered at a price that is above the market price, a transaction may not occur.

5.11.2. Direct Negotiation

A direct negotiation occurs when an individual buyer and seller enter a period of discussion and negotiation to determine a price, and to determine whether a transaction will proceed.

In this method there may be high chance that a transaction will proceed.

Disadvantages with direct negotiation may include the possibility of an unfavourable outcome if the other party has greater bargaining power, and an uncertain final price.

For example, in a market with only one major customer and several suppliers, the customer may have superior bargaining power, as the customer can walk away from the negotiation and source goods from another supplier, while the supplier may have no alternative but to supply a single customer.

The opposite case may occur when an essential input is only available from a single supplier.

This method may be used between suppliers and customers in transactions involving large volumes of goods, such as the sale of bulk mining commodities.

5.11.3. Bid & Offer

A bid-and-offer method involves a series of bids and offers.

This may involve two parties announcing bids and offers regarding a single asset, or multiple buyers and multiple sellers may lodge bids and offers for assets that are sold in large volumes.

This system differs from a negotiation process, in that no discussions are involved.

A transaction occurs when a party accepts a current bid or offer.

In the case of a single asset, the item may be initially offered for sale at a specified price.

The buyer may then accept the price, or submit a bid at a lower price.

The seller may accept this bid, maintain the current offer, or reduce the offer price.

This process may continue until one party accepts a current bid or offer, or choses to withdraw from the negotiation.

The bid and offer system may have several benefits.

This method is particularly suitable when there are a large number of buyers, a large number of sellers, or both.

Discussion is not involved in the bid and offer system.

The lack of discussion may avoid a considerable amount of time and effort that may be involved in a direct negotiation.

Also, in the case of a large volume of transactions, direct discussion may not be practical.

The only actions available in a bid and offer system are the following:

- Lodge a new bid or offer.
- Change a current bid or offer.
- Withdraw a bid or offer.
- Accept a bid or offer, and a transaction occurs.

Disadvantages with this system may include the fact that several changes in bids or offers may need to be made before a transaction finally occurs.

This system may involve a higher failure rate than a direct negotiation, with a larger percentage of transactions failing to proceed due to one party withdrawing from the process.

Also, long delays may result when both the buyer and the seller maintain their positions and wait for the other party to alter their bid or offer.

A bid and offer system may be used in large scale formal markets, such as stock exchanges.

This method may also be used in large transactions such as the sale of a business, where each bid may rest for weeks or months before an updated bid is submitted.

5.11.4. Expressions of interest

Expressions of interest involve posting a notice that an item is for sale, and inviting potential buyers to submit offers or to signify that they may be interested in negotiating a purchase of the asset.

This method may be used for the sale of large assets, particularly businesses.

A notice may be issued in a newspaper calling for expressions of interest, an investment bank or stockbroker may contract possible buyers to inform them of the situation, or general information may be made known within a small industry.

Following the notice, a period of several weeks or months may pass in which potential buyers may lodge notices of interest.

This may take the form of simply contacting the seller and indicating that the party would be interested in having discussions about a possible sale, it could involve a preliminary written submission, or it may involve a request for additional information.

In some cases, a detailed document may have been created about the asset, such as a full set of accounts and a detailed description of a business for sale, or a specification of the services required for a contract services agreement.

Following the initial submissions, a short list of serious buyers may be compiled, and then detailed negotiations may proceed with several potential buyers until a sale transaction is agreed.

This system may be relevant in cases where an asset could be put to a range of different uses, and where the sale price may be dependant on a buyer purchasing the asset for a specific purpose.

A large area of vacant land may be an example of this situation.

In this situation, a potential buyer may lodge an expression of interest in purchasing a section of the land, in purchasing the entire parcel of land for subdivision with delayed payment terms, or may propose a joint venture project development.

5.11.5. Tender

A tender system involves potential buyers submitting written offers.

The seller may then select a tender based on the price offered, and possibly other issues such as the timing of payments, and the transfer of an asset in stages.

Large properties are sometimes sold by tender, and this system is also used when selling assets during company liquidations and sales of businesses.

This system may have a benefit for a seller in that the buyers only have the opportunity to submit a single bid.

In this situation, buyers may submit strong bids for the asset, as a low bid price may result in the asset purchase being lost.

In the case of a fixed offer or an auction, a buyer may have been willing to pay a higher price, and the seller may loose the potential benefit that they may have gained from a higher sale price.

However, in cases where buying interest may be low, tenders may not be submitted, or purchase offers that are submitted may be low.

Buying an asset by tender may require a detailed knowledge of the market value of the asset, and may also involve a careful consideration of the likely bids that the seller may receive from other parties.

5.11.6. Auction

An auction may be conducted at a particular time and place.

Potential buyers may assemble together, and buyers may issue bids either verbally or using some other system such as raising a bidder number card.

Bids may continue, with each bid being higher than the last, until a final bid stands and no other bids are made.

Following a short delay, the auctioneer may declare that the auction has failed and that the asset will not be sold, due to the reserve price not being reached, or may declare that the asset will be sold to the final bidder at the final bid price.

Auctions may be used in a wide range of commercial situations.

Assets sold by auction include properties, artworks, and general assets during liquidations.

Licenses to operate certain activities are sometimes sold by auction, particularly when there is a limited quantity available.

A license to use certain radio frequency spectrums may be an example of this.

Businesses are not usually sold by auction.

Auctions are also used in some markets, where a range of wholesale buyers and sellers may assemble in an auction venue and trade commodities by auction.

For example, cattle and wool are sold by auction.

Possible advantages with an auction sale may include the fact that there may be a high likelihood that a transaction will be occur, particularly when the seller simply wishes to sell the asset at the highest available price, whatever that may be.

Also, when there are a large number of bidders, this may drive the price to a higher level than may be achieved by a direct offer.

An auction may also have a benefit in that an auction may occur on a known date, and may be completed within a short period of time.

This is in contrast to other methods that may take weeks or months for a sale to occur.

In the case of a limited number of active bidders, however, an auction sale may not produce a strong sale price.

In this case, the highest bidder may only raise their bid until other parties withdraw, which may be below the price that they would have been willing to pay, and may be below the price that could have been achieved from a fixed-price sale over a period of time.

Although a negotiation or a fixed-price offer may be used after an auction, in practice the auction process may exhaust buying interest, and the seller may be unable to obtain a significantly higher price than the final bid.

5.11.7. Dutch Auction

A Dutch auction may involve beginning with a high price, and gradually reducing the price until a buyer accepts the current offer.

This system is named in reference to the system that was used to sell tulip bulbs in Holland in the distant past (** check time/current usage).

The Dutch auction system may be used to sell some commodities.

In these cases, buyers and sellers may assemble in an auction venue and items may be processed in lots, a “lot” being a single auction transaction.

A Dutch auction may be useful when a large volume of transactions must be conducted, as each transaction may be finalised very quickly.

In some arrangements, a clock may be set with a price that descends at a steady pace toward zero, with the sale being made at the current clock value by the first person that signals an agreement.

This system may enable a large number of separate transactions to be carried out within a reasonable period of time.

5.11.8. Strategy in sales and purchase

An effective asset sale or purchase may involve a number of steps.

Before offers are lodged or negotiations are commenced, a valuation process may be involved.

This may involve a personal assessment of the asset, based on recent sales, valuation multiples, or other approaches.

In some cases, a formal valuation may be arranged from a valuation firm before the purchase or sale process beings.

An effective valuation may involve assembling a range of information, such as the price and details of recent sales, and the condition of the asset itself.

Following a valuation process, a price limit may be determined before the selling or purchase process begins.

In the course of a negotiation process, it may not be possible to consider alternatives and to form an opinion of prices.

In general, these steps may need to be taken before a negotiation or auction commences.

The approach of the opposing party, or competing bidders in an auction may not be known in advance, and in general a business should be prepared to withdraw from bidding or negotiations at an appropriate time.

5.11.9. Summary of sale methods

Direct offer	An asset is offered for sale at a fixed price. Negotiations are not conducted, and a sale occurs when a buyer accepts the offered price. The offer price may be reduced if an extended period of time passes without a sale occurring. This method may be used in retail operations, and for the sale of small or large assets.
Direction negotiation	A direct negotiation may take place between two parties, based on discussions until an agreement is reached. A low bid price or a high offer price may be used initially to begin the negotiation process. This method may be used for the sale of large assets, and for complex arrangements such as projects or joint ventures.
Bid & offer	Bids are submitted by multiple buyers, and offers are submitted by multiple sellers. In the case of a single asset, a buyer and seller may announce bids and offers in sequence. Transactions occur when one party accepts a current bid or offer of another party. This method is used by stock exchanges.
Auction	Buyers lodge competing bids in a series of bidding, until one bid remains and no further bids are made. This becomes the highest bid, and the seller may accept the bid, reject the bid, or offer a negotiation process. This method is used to sell

	properties, and items such as art works, collectibles, and commodities.
Tender	Buyers each submit a single offer in writing, and a tender is selected by the seller. This method is used to sell large assets.
Dutch Auction	The auction price commences at a high level, and the price steadily reduces until a buyer accepts the current price. This method may be used in some commodity markets that involve a large number of transactions.
Expressions of interest	An announcement is made concerning an asset for sale or a proposed transaction, and written or verbal expressions of interest may be lodged as a preliminary step in a negotiation or a contract arrangement.

5.12. Exit strategies

Every business owner will exit a business operation, even if this only occurs through death.

Considering the future options for exiting a business may be an important issue in determining a business structure.

This may affect the choice of legal structure, such as a partnership, company or holdings directly in the individual's name.

In some cases, particularly in the case of a business formed by a group of people, considerable regret may occur at a later time, in terms of different arrangements not having been made when the business was first established.

A decision to exit a business may arise due to retirement, a lack of interest in continuing to operate the business, or continued problems with the operations and activities of the business.

A number of approaches may be used by a business owner to exit the operation of a business.

5.12.1. Methods of exiting a business activity

5.12.1.1. Withdrawal & inheritance

In some cases, the business operator may retire for active involvement in the business, and other family members may take over the management of the business.

In these cases, the assets of the business may pass to other family members through inheritance.

5.12.1.2. Disbandment

Withdrawal from a business operation may be achieved by ceasing business operations, selling the business assets, and repaying any outstanding debts.

This option may be used is some of the following circumstances.

- When the business owner personally performed a significant amount of the work.
- When the business operates in a declining industry, with falling sales levels and low profitability.
- When a buyer cannot be found for the business.
- When the business was formed for a specific project or event, and the business activity has been completed.

In the case of a business that was operating on a sustainable basis, a higher value for the business may generally be received by selling the business as an operating enterprise, rather than ceasing operations and selling the assets.

5.12.1.3. Float

A public float may be used as an exit strategy for medium sized and large businesses.

A float involves selling the business to a large number of investors from the general public.

A prospectus is prepared, containing a full set of audited accounts, and a detailed description of the business.

The float process is generally managed by an investment bank or stock broker.

This may involve some of the following activities.

- Advising on the pricing of the float.
- Assisting in the preparation of the prospectus.
- Locating potential investors.
- Underwriting the float by agreeing to purchase some of the shares directly, if not all of the available shares are purchased.

The shares of the company are generally listed for trading on a stock exchange after the float process has been completed.

In some cases, the business owner may retain a significant proportion of the shares as a passive investment, while in other cases the entire business may be sold.

In cases where the business owner personally managed the business, a chief executive officer or a management team may need to be employed before the float process was conducted.

A period of six to twelve months may be required in order to establish a stable operation, before the float process was attempted.

A public float may be a practical option in cases where a business was sufficiently large, and was operating on a profitable and sustainable basis.

Investor interest in floats may vary significantly with changes in economic and stock market conditions.

During some periods of time, a float may not be a practical alternative, due to a general lack of investor interest.

5.12.1.4. Trade sale

A trade sale involves a sale of the business to another party, generally another business.

This may be a sale to a competitor, for example.

In this case, the competitor may gain an increase in size and an increase in efficiency through economies of scale.

Alternatively, a business that operates in another industry may purchase the business, either as an investment, or as a method of gaining entry to another market.

5.12.1.5. Sale to other investors

In the case of smaller enterprises, withdrawal may involve a sale of the business to another individual.

In the case of a partnership, another individual may buy the partnership interest from the withdrawing partner, and join the partnership.

The value of the partnership interest may be based on the assets of the partnership, and the value of the ongoing operation, such as an established client base.

In the case of general business operations, another investor may be located to purchase the business owner's share of the business, or the entire business.

Businesses are offered for sale through business brokers, newspapers, and a number of publications.

However, in some cases a long period of time may be involved before a buyer is found for a business.

In other cases, a buyer may not be found, despite the business operating on a profitable basis.

In some industries, sales of businesses may operate on a "walk in, walk out" basis.

This arrangement may be used with businesses such as cafes, where the premises may be leased, and the business may have few assets.

This arrangement may involve a buyer making a nominal payment to the selling business operator, to cover assets such as stock on hand.

The buyer would then take over operation of the business from the seller.

5.12.1.6. Buyback

In cases where the business owner owns only part of the business, in some cases a withdrawal may be implemented through the business buying the shares or the partnership interest directly from the business owner.

This transaction has the effect of the business owner withdrawing their share of the business value in the form of cash.

The business may then become a smaller enterprise.

This option may be practical when the share of the business is relatively small, or when the business assets include a significant holding of cash.

In the case of a larger share of the business, the same process could be implemented, with the payments being made over a period of time from the net income of the business.

5.12.2. Barriers to exit

A number of issues may arise that may create difficulty or cost in exiting a business operation.

Barriers to exit may be a significant issue in some business situations.

In some situations, a business operator may find that the business activity may generate a loss, or that a low level of return may be achieved from the business operation.

In other cases, a business owner may simply not have an interest in continuing the business activity, for one reason or another, and may wish to withdraw.

For a number of reasons, withdrawing from a business activity may not be possible without incurring a major financial loss.

The may occur for some of the following reasons.

5.12.2.1. Types of barrier to exit

5.12.2.1.1. Termination penalties

In some cases, contracts may exist with suppliers, customers of other parties, that may involve fixed term agreements, and termination penalties.

For example, a business may have a twelve month supply agreement with a customer.

If the business failed to continue to supply products for the full twelve month period, this may represent a breach of the contract, and the customer may sue the business to recover any losses that they may have incurred.

As another example, a franchise agreement or service contract may include terms that specify penalties for terminating the agreement before a fixed period of time had elapsed.

5.12.2.1.2. A lack of buyers

Although transactions involving shares and properties may occur in high volumes, the same situation may not necessarily apply in the case of a sale of a business.

Physical assets may be purchased in many circumstances.

In the case of a business purchase, however, this may either require a buyer who wishes to commence a business operation, or locating another business that wishes to purchase the business from the business owner.

In some situations, a larger number of businesses may be offered for sale, than there may be buyers for a business.

A business owner may have established a successful business operation with considerable value.

However, despite a business operating profitably and having significant net assets, a buyer may simply not appear for the business.

5.12.2.1.3. Large capital investments

In some cases, which may particularly involve purchasing a business or entering a packaged business opportunity, a large investment may be made to commence the business operation, or to purchase an asset.

An on-going value for the investment may be received by continuing to operate the business.

However, if a buyer cannot be found, then the business owner may loose the value of the initial investment if they withdraw from operating the business.

A similar situation may apply in cases where large expenses may have been made for a future benefit, such as the costs of a new product development, the cost of establishing a product within a new market, and so on.

5.12.2.2. Avoiding barriers to exit

In some cases, a business owner may continue to operate a business for many years against their desire, due to the costs that may be involved in exiting the business.

Potential problems with barriers to exit may be reduced by following some of the following approaches.

5.12.2.2.1. Contracts

Contracts that include long minimum terms may need to be considered carefully before they are accepted.

In some cases, a business owner may have intentions of continuing the business activity for an extended period of time.

However, a wide range of unexpected events may occur, and circumstances may change significantly before the contract expires.

Entering a contract that includes long fixed terms may create a risk for the business.

This issue may also affect the general ability of the business to adapt to changed circumstances, in addition to exit issues.

This issue may be addressed in a number of ways. These may include some of the following approaches.

- Carefully considering the terms and conditions of contracts, before accepting contact terms.
- Avoiding long-term fixed period contracts, and using short-term or floating agreements that may not involve specific periods of time.
- Including termination conditions as terms within a contract. In some cases, a termination penalty may be included, however this may be lower than the loss that may have occurred on terminating a fixed-term contract that did not include specific termination conditions.

5.12.2.2.2. Realistic exit scenarios

In building a business, a realistic view of the exit value of the business may need to be maintained.

In cases where a business owner may operate as a sole trader and may perform all or much of the work personally, a business may have no saleable value.

In some cases, a long period of time may be required in order to locate a buyer for a business.

In commencing and operating a business, a business owner may need to consider the possibility that a buyer may never be found for a business.

In this case, the only value that may be salvaged from a business operation may be the value of selling the assets of the business, if any.

5.12.2.2.3. Personal assets

In some business situations, the entire business profits may need to be re-investment in the business activity to maintain the business operation on a sustainable basis, or to expand the business.

Income for the business owners in these circumstances may take the form of payments for personal income and expenses.

However, where possible, a stream of dividends may be drawn from the business, and used to accumulate personal assets.

With a risk arising that a business may have little or no value when a time may arrive to cease operating the business, the business owners may consider accumulating personal assets, separately from the business, over a period of time.

Retirement may be one situation in which this problem may arise.

5.13. Buying a business

Buying a business may involve several advantages as a method of commencing business operations in comparison to starting a new business.

5.13.1. Advantages

The risk involved in buying an existing business may be far lower than the risk involved in a start-up enterprise.

An existing business may have an established client base, ongoing operations, and would generally have positive cash flow and be profitable.

Exceptions to this may include purchasing a distressed business, which is a separate situation to commencing ongoing business operations.

In the case of a start-up enterprise, an initial period of capital expenditure and negative cash flow may be involved, however the future income from sales may be uncertain.

In contrast, purchasing an established business that was in sound condition may allow the business owners to commence regular business operations immediately.

This approach may also avoid a long time delay that may be involved in developing a start-up enterprise to a sustainable level of operation.

5.13.2. Disadvantages

A number of disadvantages may also apply to the option of purchasing an existing business.

Goodwill

In the case of an established business, a substantial cost above the value of the net assets may be required to purchase the business.

In general, the value of a business increases with the level of stability of the business income, and the potential for future growth.

A business that involved a stable net profit, solid margins and cash flow, and a positive growth outlook may trade at a high price.

The additional price above the net assets is the accounting "goodwill" value, and corresponds to the value of the business structure, and the value of the established flow of customers.

This term originally referred to the fact that an established base of regular customers involved a value for the business that was higher than the value of the net assets.

In some cases, the price of a business may trade at a high multiple of net profit.

In these cases the profit return from purchasing the business may represent little more than the return that could be earned from investing the funds in a bank deposit or other traditional investment.

Alternatively, the goodwill price could be viewed as an expense of entering the business operation, and written off immediately as a loss.

In contrast, in the case of a start-up enterprise, a goodwill expense does not have to be paid.

However, a start-up enterprise may need to invest large sums of capital, and re-invest cash flow, in order to build a customer or client base to a sustainable level.

A goodwill price may also be avoided through purchasing a business in which there were a range of problems that needed to be addressed, or where the net profit may be less stable that the profit of businesses that traded on high multiples.

Purchase price

A business is an intangible asset, and valuing a business accurately may be difficult.

In the case of purchasing a business, a risk exists that an excessive price may be paid, resulting in a loss of value.

For example, a business may appear to be in a sound condition, with stable net profit and solid margins.

A substantial goodwill price may be paid to purchase the business.

However, soon after the business owners commence operations, conditions may deteriorate, and the value of the business may reduce to be little more than the value of the physical assets.

This risk of this situation occurring may be reduced through ensuring that the business owners have a sound knowledge of the industry in which the business operates, through obtaining an independent business valuation, and through carefully assessing the assets and operations of the business.

Knowledge & experience

Another possible disadvantage with purchasing a business, in contrast to a start-up approach, may involve the process of developing the business.

A start-up business enterprise may involve many problems, and many lessons may be learned by the business owners in the process of building a business from a start-up position to a sustainable operation.

In the case of purchasing a business, this knowledge and experience may not be gained by the business owners.

This may lead to difficulty in operating and effectively developing the business in the future.

5.13.3. Locating a business

Businesses are offered for sale through business brokers, and are advertised for sale through various publications.

Business brokers carry lists of businesses for sale, and may arrange negotiations between the buyer and the seller of a business.

5.13.4. Valuation

In some cases, a business has a simple structure and operation, and the value of the business may be estimated fairly readily.

This may particularly apply in the case of buyers who are familiar with the industry that the business operates in.

However, in other cases an independent valuation of the business may be sought.

A valuation is arranged by contacting a business valuer, who prepares a detailed report of the business and provides an estimate of the business value.

5.13.5. The intangible value of a business

Extreme care may be required in assessing the operations and nature of a business.

In the case of a property, a section of land and a physical building may be purchased.

In this case, the value may move against the new owners, however the asset can be physically inspected, and the asset itself has an independent and on-going value.

In the case of a business, the entire value of the business may be based on the fact that the business exists and operates, rather than the value of any physical item.

For example, a business may provide cleaning services to commercial office buildings.

The business may collect fees from clients, pay salaries to employees, and purchase supplies.

This business may generate a significant positive cash flow, and a substantial price may be paid to purchase the business.

However, the business may have few physical assets.

If several major customers cancelled their orders, income could fall to almost nothing.

In this case, the operation of the business may cease, and the business owners may loose the entire amount that they invested in purchasing the business.

Unlike a physical asset such as a property, the value of a business is dependant on continuing operations.

A business that has a high value at one time may have little value if operating conditions deteriorate.

5.13.6. Assessing a business

A range of issues may result in the sustainable value of a business being lower than the value that appeared to exist at the time of the business purchase.

5.13.6.1. Problems with assessing a business

Accounts and trading results

As with any asset, the seller of a business may be expected to present the business in its most favourable light, in order to obtain a strong sale price for the business.

Activities involved in this process may range from fixing problems that should have been fixed a long time ago, to producing an entire set of fraudulent accounts and records, complete with non-existent assets and non-existent customer arrangements.

There are many ways in which a set of accounts can be "dressed up" in order to present an improved picture of a business for sale.

This may involve issues such as reducing depreciation rates, placing optimistic valuations on assets, capitalising expenses, and so forth.

These alterations may not involve false statements, however the reported net profit figures may be higher in these cases than the figures that may be produced by a more conservative accounting treatment of the business operations.

As another example, maintenance expenses could be reduced or cancelled, in order to make the costs of the business appear to be low.

However, this may not be sustainable on a long term basis, and the new business owners may need to restore the maintenance activities to prevent equipment from becoming non-operational.

Seasonal and cyclical businesses

Some business activities may have stable sales and net profit figures over a long period of time.

However, in the case of most business activities, there may be substantial differences in sales and profit levels from one period to the next, depending on economic conditions, activity within an industry and so forth.

A business owner may be more likely to sell a business during times of strong sales and profit, when a high price may be achieved, than during times of slow activity when prices may be low and their may be little interest from potential buyers.

In these situations, the current sales and profit levels of a business may not represent the average long-term results of the business operation.

Statements by the previous owners

In some cases, false or misleading statements may be made by the previous business owners, in an attempt to secure a higher selling price.

In other situations, statements may be made in good faith.

However, these statements may simply represent the views and perspective of the previous business owner, and these statements may be more misleading in some causes that statements that are deliberately false.

In either case, discussions with other parties may cloud the ability of the buyer to think clearly and objectively, and to form a clear view of the value of the business, and the potential business operations.

5.13.6.2. Assessing a business

The assets of a business should generally be personally inspected by the business buyer.

This may allow the business buyer to verify the nature of the assets, and become familiar with the assets involved in the business purchase.

Previous trading results may also be reviewed.

As a minimum, the previous twelve months of monthly figures may be needed in order to form an assessment of the operations of a business.

Although the previous trading results of a business may be an important input to the assessment process, in general a business assessment should be based on the assets and structure of the business, rather than the business's previous results.

This approach may avoid placing an inaccurate value on a business based on previous trading results.

Previous trading results may be higher than sustainable future levels, due to a past period of strong activity, personal contacts or issues relating to the previous business owners, or the methods used in preparing and presenting the trading results.

In other cases, the previous results may understate the potential of the business.

This may occur when the business owners may have lost interest in operating the business over a period of time, and the business operations may have gradually deteriorated.

However, the assets of the business may be in sound condition, and the business may have a potential for stronger sales and activity levels if the business operation was revitalised.

Valuations may be frequently based on multiples, such as a multiple of ten times net profit.

However, the relevant figure to use in this case is the potential sustainable profit, not the previous profit level.

The potential sustainable profit may be higher or lower than previous levels.

This figure may be estimated based on the assets and structure of the business.

As an example, an equipment distribution business may be assessed on the volume of transactions, the area that is serviced by the business, and so on.

These details may then be used to determine an approximate potential income from the operation.

Previous results could then be used to check than an excessively high or low estimate had not been made.

Research and gaining knowledge of the industry may be needed in order to perform an assessment of this type.

However, this process may be necessary in any event, in order to effectively operate the business activity.

In many cases, the current operational levels may be a major input to the valuation process.

However, in principle the potential income, rather than the current income, may be the relevant figure in assessing a business value.

5.13.7. Funding

Funding to purchase an existing business may be raised from a number of sources.

In some cases, the business owners may be able to fund the purchase of the business from personal assets.

Bank loans may be available to fund a business purchase.

However, this may require security, such as a mortgage over a property, and may only be available in cases where the business income was reasonably stable.

In some business sales, “vendor financing” may be available.

This may involve the seller of the business providing the financing arrangements.

In effect, this may result in the price of the business being paid in instalments over a period of time, with the payments being made from the cash flow of the business.

In some situations, equity funds may be sourced from investors, and used in the purchase of the business.

This may lead to a long-term passive investment, or the business plan may include a plan for the business operators to buy out the passive investor’s share of the business over the long term, using their share of the business profits.

5.14. Franchising

Franchising is a business model that has gained considerable popularity and success.

Perhaps the best-known example of a franchise organisation may be the McDonalds corporation (**check).

5.14.1. The franchising system

The franchising system operates with an organisation that develops products and conducts marketing and promotion activities.

The actual production or delivery of services is done by independent business operators, who pay a fee to the franchise organisation in return for the use of the brand name and the product or service design.

Examples of franchise organisations may include retail and food outlets, and services such as home maintenance.

The business owner pays a license fee to the franchise organisation, which may be regular fixed dollar amount, a percentage fee based on sales, or a combination of both.

However, the business owner operates an independent operation.

The income and expenses of the business flow directly to the business operator, with the license fee being an expense of the business operation.

5.14.2. Advantages

The franchise system may be a lower-risk alternative to commencing business operations that a start-up operation.

The brand name of the organisation may be well known, and the business owner may receive a steady flow of customers soon after they commence operations.

Advertising and promotion may be handled by the franchising organisation, and in some cases a set of products may also be available.

The advertising and product development expenses may be spread across all the business operations, rather than being borne by the single business owner themselves.

This process may allow a more effective advertising and promotion system to be conducted than would be possible in the case of a completely independent business.

The brand name may also gain recognition from the activities of the other independent operators, in addition to the business operations of the business owner themselves.

5.14.3. Disadvantages

There may be several disadvantages with a franchise business in comparison to a completely independent business operation.

Fee levels

The fees and charges may vary widely between different organisations.

In some cases, the fees may be low and a range of quality products and successful advertising may be provided.

In other cases, the fees may be high and the business owner may receive little in return for the fee, apart from the use of the business name.

Restrictions on operation

A more severe problem may relate to the restrictions that may be placed on the business owner.

In many cases, the business owner may be allocated a certain region of operation.

Under the terms of the franchise agreement, the operator may not be permitted to operate outside that region.

This may effectively prevent the business from expanding in the future.

A sole enterprise may be the desired outcome.

However, this potential limitation may need to be recognised in advance, as this restriction may prevent an expansion from occurring at a future time.

In some cases, such as the example of retail stores, this issue may not be particularly relevant.

A range of other restrictions may also apply in some cases, such as a requirement to purchase general supplies from the franchise company.

Products

In the case of products, in some cases a set of products must be purchased directly from the franchise organisation.

In the case of products that are specifically developed for the business activity, this may be a benefit of the franchise arrangement.

However, in the case of general supplies, this may limit the ability of the business to select products from alternative suppliers.

5.14.4. Commencing business as a franchise operator

Commencing a business as a franchise operator may involve approaching a franchise organisation, and expressing interest in becoming a franchise operator.

An initial sum of capital may need to be invested, depending on the particular situation and the organisation.

A franchise agreement may normally be involved, which would be a contract between the franchise operator and the franchise organisation.

This contract may contain a large number of terms, and in general the franchise agreement should be reviewed very carefully before a decision is made to sign the agreement and commence operations.

In some situations, an operating region may be allocated to the franchise operator, while in other situations, the operator may conduct general business activities without being restricted to a certain operating area.

5.14.5. Creating a franchise business

Another business alternative may involve creating a franchise organisation.

Franchise organisations may begin as a small successful business operation.

Rather than expand in the traditional way, a businesses may chose an alterative route of becoming a franchise organisation.

Effectively, the organisation may become a licensor of intellectual property, in a similar way to producers or music or computer software.

Income may be received from the fees paid by the independent operators.

The business may need to operate successfully in order to attract business owners as licensees.

Simply offering the use of a business name and other services may not attract business operators unless that brand name already had a significant profile

Also, this business model may not be suitable for many industries.

A franchising model may apply in cases where a business operation serviced a limited region, such as retail shops, food outlets, and home services, rather than industries in which the products were distributed through a wide area.

5.15. Mergers, acquisitions & divestments

An acquisition involves the purchase of another business.

A merger involves two separate businesses merging to become a single business enterprise.

In the case of a divestment, a business unit or a large section of the business may be sold as an independent business.

These activities may be done for a wide range of reasons within the development of a business activity.

5.15.1. Acquisitions

5.15.1.1. Access to technology & assets

A business may be purchased to gain access to technology or assets that are held by the target business.

For example, the target business may have access to a unique production technology, that may enable the business to operate a more efficient production process.

Some of the assets that may be acquired in this way may include some of the following items.

- Technology for manufacturing production.
- Patents of various techniques.
- Technology included within products sold to customers.
- A large customer base.
- A license to operate within an industry.

5.15.1.2. Access to Markets and industries

A business may also be purchased as a method of gaining entry to a new market.

In many industries, expanding a business gradually may take an extended period of time, or may simply not be practical.

This may occur within industries that are fragmented into a large number of organisations, for example.

Also, commencing a small operation and gradually expanding may not be practical within industries in which economies of scale may have a significant impact on costs, and where the industry is consolidated into a small number of large organisations.

In cases such as these, purchasing an existing business operation may be the only practical method of establishing a sustainable presence within an industry.

This situation may also apply to industries in which a limited number of licenses are available, or which have consolidated into a small number of large organisations.

As an example, entering the television broadcasting industry may only be practical through purchasing an existing broadcaster.

As another example, a business that operated in an established, low-growth industry may purchase a business within a high-growth industry as a method of gaining a presence within a growth industry.

5.15.1.3. Economies of scale

Purchasing a business may be used to achieve economies of scale.

Purchasing another business may allow the business to make a large leap in sales volumes.

In turn, this may allow for the establishment of high capacity production facilities, which may reduce the average cost-per-unit across the full range of the business production.

In the case of service businesses, an acquisition may increase the number of clients and transactions, and the fixed costs of the business may be able to be spread across a larger number of transactions.

5.15.1.4. Investment

A business may accumulate substantial cash holdings following an extended period of successful operation.

In this situation, a capital distribution to shareholders may be conducted.

Alternatively, the funds may be invested in expansion, new projects, or new facilities.

One alternative in this situation may be to purchase another business as an investment.

For example, a business may have established a successful product, with a stable and sustainable level of sales.

In cases where a business of this type was available for purchase at an attractive price, the business may purchase the target business as an investment.

In these circumstances, the target business may be maintained as an independent business operation, with the net profit of the target business representing the return on the investment of the purchase price.

5.15.2. Mergers

Mergers occur when two organisations agree to merge and form a larger organisation.

A merger situation may occur when each business is of a similar size.

Mergers may occur in a number of circumstances.

5.15.2.1. Consolidating industries

One pattern of industry development may involve a large number of small businesses being established, followed by a gradual consolidation into a small number of large business operations.

This may occur in the case of new industries, and also in cases where new technology or processes allow economies of scale to be achieved in the business activities.

In this situation, an individual business may be faced with a number of alternatives.

A business could accept an offer of purchase from another business.

Alternatively, the business could remain independent and continue operations.

However, costs and prices may fall steadily in a consolidating industry, as producers become larger, and costs-per-unit decline due to economies of scale.

In this situation, a business may be unable to reduce costs and prices in line with industry levels, and may gradually loose customers.

This may lead to the eventual closure of the business.

Another alternative may involve merging with an organisation of a similar size, in order to establish a larger organisation and remain competitive within the industry.

5.15.2.2. Access to facilities

A business may also merge with another business in order to gain access to facilities, distribution channels, or a source of products.

In cases where items such as these cannot be obtained from suppliers or through standard business arrangements, a merger may enable the business to continue operation as a new structure.

5.15.3. Divestments

Divestments occur when an independent business unit, or a large part of the business, is sold as an operational business.

This may occur in a number of circumstances.

5.15.3.1. Multiple business units

In some cases, a business may operate activities in several different industries.

For example, a diversified business model may be based on a business operating a number of separate business units in different industries, as a method of reducing risk.

This business model became popular during the 1980's.

However, although this approach may reduce risks, in practice it may also reduce returns.

This may occur as the efforts of the business operators cannot be focused on several different operations at the same time, and different knowledge and skills may be necessary for each industry.

In practice, successful businesses may often operate within a single industry or perform a single activity, and may devote their entire resources to effectively performing a single business process.

A business may operate business units in several industries due to previous expansion, a previous acquisition of a diversified business, or a previous purchase of an investment business.

In these situations, a business operation in one industry may be sold to enable the business to focus on performing a single type of business activity.

5.15.3.2. Loss-making operations

In some situations, a section of a business may operate at a continual loss.

Despite attempts at restructuring, new investment, and changes in processes or products, losses may continue.

In these circumstances, the business operation may be closed and the assets may be sold.

Alternatively, if a buyer can be found, then the business unit may be sold as an operational enterprise.

This may occur, for example, in cases where a buyer may wish to expand operations by gaining access to a customer base, despite the fact that the existing operations may not be effective.

5.15.3.3. Buyer interest

In some situations, buyers may express interest in purchasing a business unit, and may be willing to pay a higher price that the value of the business unit to the existing business.

For example, a buyer may wish to achieve economies of scale, or enter a new industry, and may be willing to pay a premium in order to conduct a transaction.

In situations such as these, the business unit may be sold, where the price offered may exceed the value of the operation to the existing business.

5.15.4. Structures post an acquisition

Following an acquisition of a business, a number of different approaches may be taken.

This may include some other the following alternatives.

5.15.4.1. Integration

The target business may be integrated with the existing business operation.

This may occur when the purpose of the acquisition was to achieve economies of scale, by expanding the volume of sales of an existing set of products.

Also, the intention may be to create a single business operation that included the functions, products or services of both the purchasing business and the target business.

An integration may allow cost savings through eliminating duplicated operations and reducing staff numbers.

For example, the product lines of the buying business and the target business may be similar, and it may be possible to reduce the cost and complexity of the combined operation by establishing a single set of products.

However, this process may not automatically occur simply from combining two business operations.

Reduced costs may apply in the case of capital facilities that can process variable volumes, such as manufacturing facilities and computer systems.

Examples may include using a single computer system in place of several different systems, and consolidating several internal areas that perform similar activities into a single area.

In some cases the combined operation may become extremely complex, with a large number of overlapping functions and duplicated activities.

An integration process may involve creating a new business structure based on the underlying functions and products of the business.

In the case of large organisations, this process may involve a significant period of time and may result in the creation of a business operation that is significantly different from the original operations of either the buying business or the target business.

5.15.4.2. Separate businesses

In some cases, the target business may be maintained as an independent operation.

This may occur when the business being purchased operates in a different industry to the purchasing business, or where the target business is purchased as an investment.

5.15.4.3. Asset stripping

An asset stripping exercise involves purchasing a business, ceasing operations, and selling the assets, or integrating the assets with the existing business.

This may occur in cases where the target business may have significant assets, however the operations of the business may not be effective in producing a sustainable business operation.

This may occur when a combination of assets has been assembled that is not suitable for a particular business activity, when the business has been poorly managed, or when the business operates in a declining industry.

5.15.5. Control following a merger or acquisition

An acquisition may have significant implications for control within the target company, while a merger may involve issues of control within both businesses.

In the case of a merger, an intense struggle for control of the combined business may occur between senior executives of each of the merging businesses.

In practice, the executives of one company or the other may eventually win out, with executives from the other original company leaving the business over a period of time in a variety of ways.

In the case of an acquisition that is retained as a separate operation, the acquisition process may have varying effects on the control of the target company.

In some cases, the buying business may take direct control of the business operation.

In other situations, the business operation may continue with little change.

An independent board of directors may continue to operate, and the only practical effect may be that reporting may be delivered to another business, rather than being issued to shareholders.

In the case of integration, control of the target company operation may pass into the hands of the buying business.

5.15.6. The acquisition process

5.15.6.1. Takeovers

In the case of a listed company, an acquisition may commence with the buying company delivering a takeover offer to the board of directors of the target company.

The takeover process is regulated by specific regulations in the commercial law.

These regulations may specify the documents that must be delivered, time frames for various steps in the process, and actions under a variety of circumstances.

The offer price would usually be higher than the recent market price of the shares, as an incentive for the shareholders to agree to sell their shares.

This may lead to a public announcement that a takeover offer had been received.

This action may lead to higher bids being submitted by other potential buyers, and over a period of several months a number of offers may be made for the company.

A takeover offer proceeds when a majority of shareholders agree to sell their shares to the buying business. (** check percentages & scenarios)

5.15.6.2. Direct purchase

A direct purchase may occur when a private business is purchased directly from the business owners.

This may occur when the business owner decides to exit the business for retirement or other reasons.

In the case of large businesses, an investment bank may be used to manage a sale process, to estimate a value for the business, and to locate potential buyers.

In the case of smaller enterprises, a business may be offered for sale through a business broker, or advertised for sale in newspapers or other publications.

5.15.7. The divestment process

5.15.7.1. Floats

In the case of a divestment, the business unit may be listed separately from the main company on a stock exchange.

This may involve the existing shareholders receiving a pro-rata allocation of shares in the new company.

There is no immediate change in value or short-term effect from this process.

However, splitting the company may allow the management team within each business to focus on the operations within a single industry.

Over time, the two share prices may diverge, and each company may become a completely separate operation.

5.15.7.2. Trade sales

A trade sale may occur when a business unit is sold as a complete unit to another business.

This process may allow cash to be raised from the business sale, which could be used for a capital distribution to shareholders, for investment in new projects or facilities, or to strengthen the balance sheet of the business.

In contrast, a split of the company's shares does not involve raising cash from the divestment process.

5.15.7.3. Direct sales

In the case of smaller enterprises, a section of the business would not normally be sold.

However, when this did occur, the process could be managed through a business broker, or potential buyers could be located through advertisements.

5.16. International trade & operations

5.16.1. Expansion

A business that is operating successfully may have several options for expansion.

A business may increase sales volumes and customer numbers within its current operation, through marketing, product development, cost efficiencies and so on.

Alternatively, the business could create new types of products and services, and enter a new market that it had not operated in previously.

Another option may involve retaining the current products and services, and expanding sales into a wider geographic area.

This may involve expanding interstate, and expanding into foreign countries.

Exporting is not restricted to large organisations.

Many small enterprises, and even sole traders, may export goods to foreign countries, and may import supplies and equipment from overseas.

International expansion may involve exporting products to overseas countries, and may also involve establishing operations within other countries.

5.16.2. Types of business

Some types of business may be more suited to international expansion than others.

Businesses that deal directly with the public, such as retail outlets and direct service businesses, may not consider this option due to the large capital requirements that may be involved in establishing a presence within a market that is based on sales to the general public.

Although large organisations may pursue this path, this option may generally be available to businesses with large capital resources.

In cases where the business operators may be personally involved in providing the service, such as professional partnerships, international expansion may not be commonly used as an expansion option.

Exporting may be a worthwhile option for commodity producers.

Commodities are items that trade in large volumes in open markets, with many suppliers producing similar goods, and many customers.

This may include agricultural products, mining products, and volume products such as standard computer equipment.

Prices may fall to the minimum sustainable level in these situations.

Margins may be thin, and producers may rely on large volumes in order to remain profitable.

In these cases, exporting large volumes of products may be necessary in order to create sufficient volume to operate a viable business.

Exporting may also be suitable for specialist products and services, that may have a limited market.

For example, some specialised items of equipment are manufactured in low volumes in a few places around the world, and exported to customers that use the equipment, wherever they may happen to be.

5.16.3. Exporting & branch operations

International activity may fall into two categories.

The first involves exporting products or services.

In these cases, the business may continue to operate as before, but simply deal with customers in foreign countries.

This may apply to manufacturing operations, although it may also apply to services.

For example, performing services for overseas clients is a common situation in the case of contract engineering, which may involve complex product development or large construction projects.

5.16.4. Conditions for expansion

Expansion may be a viable option when a business is generating strong positive cash flow.

In some cases, expansion may be pursued in an attempt to solve problems within the business operations.

For example, a manufacturer may have excess production capacity and high fixed costs, and may need to expand sales into overseas regions in order to generate sufficient sales to break even.

However, expansion may require a significant investment of capital and ongoing cash flow, and may place a significant drain on the business for an extended period of time.

If a business is experiencing internal problems that cannot be solved purely by increasing volumes, then in general these problems may need to be addressed before an expansion program is considered.

In addition to strong positive cash flow, a range of products or services that were successful and may meet with a demand from customers in a foreign market may be needed for a successful expansion process.

5.16.5. Capital

Establishing an overseas operation or customer base may involve a considerable capital cost.

Capital may need to be spent very carefully during this process.

In some cases, a business may attempt to establish an overseas operation, only to find that the available capital is quickly consumed.

This process may end with the business withdrawing to the original operation, having spent a considerable portion of the business's capital for no lasting result.

5.16.6. Choice of location

The choice of location may depend on issues such as language, exchange rates, the demand for the product or service, competitors and the general receptiveness to foreign operations.

In some cases, a country that is geographically close to the existing business operation may be chosen as the first place for an international operation.

This may have benefits in terms of a reduced cost of air travel, reduced shipping costs, and reduced problems with different time zones in comparison to more distant locations.

However, in many cases the most suitable location may be a location that is a considerable distance away from the base location.

In some cases, regions with the greatest similarity to the home country of the business may be on the opposite side of the world.

For example, Australian economy has some similarities to the economies of Canada and South Africa., particularly in terms of the mining industry.

However, geographically these other two countries could not be further away.

5.16.7. Distribution

Sales to overseas customers may involve issues of shipping costs and shipping arrangements, foreign currency conversion, language, customs, and government permits and restrictions.

These are practical problems that may be addressed as part of the business operation.

A major challenge in many cases may involve distribution, and communicating effectively with potential customers.

A range of possibility approaches may exist for distributing products within foreign countries.

5.16.7.1. Direct contact

Direct approaches to overseas customers may be feasible in cases where the business deals with a small number of large transactions, or deals with other business operations.

For example, direct approaches may be made to the buyers of large retail chains.

In the case of projects, tenders could be submitted to clients in overseas locations.

In terms of marketing to the general public, this may be feasible if a small region was chosen as the initial base.

However, attempting to establish a retail presence within a major market, using an approach such as a general advertising campaign, may result in the available capital being rapidly consumed without creating a sustainable level of sales.

5.16.7.2. Local operations

A local operation may involve establishing a branch office of the business in an overseas location.

This may operate as a distributor of the business's products or services.

In other cases, particularly with services, the branch may operate as a stand-alone operation that was independent of the main business.

These operations may generate a negative cash flow for a considerable period of time, and may have to be funded by the main business until they reached a break-even point.

5.16.7.3. Joint ventures & distribution agreements

A joint venture or third-party distribution arrangement may involve a business within the foreign country becoming a distributor of the products.

This may apply in cases where the business produced a unique product that was not generally available from other sources, for example.

5.16.7.4. Overseas Importers

A distribution alternative that may involve low costs for the business may involve an importer within the foreign country importing and distributing the business's products.

This may involve a regular shipment to a single delivery point, and may avoid many complications and expenses that may be involved in dealing with a large number of individual customers.

This option may be available when a product that is attractive and cost-effective is available, and would be attractive to importers and foreign customers.

5.16.7.5. On-line access

On-line access to the business products, through methods such as the Internet, may be a major component of international sales, particularly in the case of retail products that are sold directly to the general public.

In the case of some specialty items, a business may find that the majority of orders come from overseas customers, with very few items being purchased by local customers.

An on-line presence may have a benefit over other distribution approaches, in that no additional cost or development may be involved in making the products available to customers in overseas countries.

In contrast, methods such as advertising campaigns may involve considerable cost, and may need to be organised separately for each particular region.

Internet web sites may be established for relatively little cost.

However, in the case of complete sites involving large product lists, and integrated ordering, stock management and reporting systems, a considerable cost may be involved in creating and maintaining the on-line site.

Supplying overseas customers in this situation may not be significantly more difficult than supplying local customers.

Foreign currency payments may be accepted, although these payments can be made through electronic payment methods, and may not be difficult to implement.

Shipping details may be different from local orders, however shipping costs may be paid by the customer, and shipping arrangements may not be difficult to organise.

Disadvantages with on-line distribution may include that fact that traditional activities, such as advertising, may also be needed to generate sales, in addition to simply creating an on-line distribution site.

5.16.8. Closed markets

Many countries have a range of restrictions and regulations concerning imported goods, and overseas involvement in asset ownership and business transactions.

In some cases, these situations may be addressed through a long process of gaining authorisation from government departments to allow exporting to customers with the foreign country, and to conduct business activities within that country.

In other cases, more subtle problems may arise, due to different customary transactions and arrangements in business activity compared with the home country.

Problems such as these may be reduced through arranging a joint venture activity with a local business within the other country.

This may involve another business distributing the products to local customers, or arranging business transactions in combination with the business itself.

On a larger scale, a similar process may involve purchasing a business within an overseas country, and using the business for distribution of the products, of for conducting the services that are performed by the main business.

5.16.9. Foreign exchange issues

Conducting international operations may involve dealing with foreign currencies, and this may involve a number of issues.

Conversion between foreign currencies and Australian dollars is a straightforward process and this service is provided by most major banks.

5.16.9.1. Exchange rates

In some cases, the exchange rate between two currencies may be a fixed rate, as declared by a government regulation.

This may occur in the case of some small counties which may tie their currency to the value of a major international currency.

However, this is a comparatively rare situation.

A regulation cannot alter the effect of economic forces.

The value of a currency may be determined by the amount of currency on issue, and the assets held within the country of issue.

This may create a natural level for the currency exchange rate, and attempts to force transactions to occur at an altered level may be unsustainable on a long term basis.

Most exchanges rates at the time of writing are floating, and may vary in a similar pattern to the price of other market commodities such as shares, mining commodities, and agricultural commodities.

Exchange rate levels may be volatile, and changes may occur in a random pattern.

Although attempts may be made to forecast or predict long term trends in exchange rates, in general it may be assumed that future exchange rate levels cannot be accurately predicted.

5.16.9.2. Pricing

Payment may be requested in the business's home currency, or payment may be accepted in a foreign currency.

Accepting foreign currency payments may reduce the possibility of lost sales due to difficulties with the customer arranging a foreign currency transaction.

However, this alternative may also require a frequent updating of price lists, to reflect changes in exchange rates.

Exchange rates may change on a daily basis.

In cases where a price is quoted in a local currency, a price may be quoted to a customer for a specific transaction on a specific date.

Alternatively, a fixed price may be listed, and prices may be updated when a substantial rise or fall in the exchange rate occurs.

5.16.10. Managing exchange rate risk

5.16.10.1. Offsetting exposures

In some cases, the effect of exchange rate movements may be reduced by holding exposures that act in opposite directions.

For example, sourcing raw materials from the same region or in the same currency as the export currency may reduce the effect of changing exchange rates.

In this case, a change in an exchange rate may alter both the costs and the income of the business, with costs and income both rising or falling at the same time.

This affect may reduce the impact of exchange rate movements on the cash flow and net profit of the business.

In some cases, assets may be held in overseas countries.

For example, a storage warehouse may be owned in a foreign country, and used for the storage of goods prior to distribution to customers.

In these situations, the value of the asset in the local currency may change in line with changes in the exchange rate.

This risk may be reduced by holding debt in the same currency as the asset.

Changes in the value of the debt may offset changes in the value of the asset, leading to a reduced exposure of net assets to the exchange rate.

Debt could be raised to purchase or construct an asset.

In other cases, debt could be raised in a foreign currency, converted to the local currency, and placed on deposit.

This transaction may be used as a general long-term hedge against changes in foreign asset exposures.

5.16.10.2. Futures and forward sales

In the case of specific large transactions, a foreign exchange futures contract or a forward contract may be used to reduce the risk of an adverse change in a foreign exchange rate.

For example, a large item of equipment may be ordered by an overseas customer, for delivery in twelve month's time.

In this situation, a futures contract could be entered to enable a foreign exchange transaction to be conducted on a future date, with the exchange rate to be fixed at the current level.

These methods may be used to manage cash flow changes and the exposure to specific transactions.

However, futures apply over a specific period of time, and cannot be used to hedge long term trends in currency values.

5.16.10.3. Reporting issues

Producing financial statements and other reporting may involve several issues when foreign operations are involved.

The value of assets and liabilities may be translated into the local currency of the business for the purpose of preparing a balance sheet.

Large changes in net assets may occur due to changes in exchange rates, and in some cases a "foreign currency translation reserve" may be included within the net assets figure to reflect the change in net assets that is due to a change in exchange rates.

In the case of exports of products, imports of supplies, and operations in foreign countries, large rises and falls in sales, cash flow and net profit may occur from one period to the next, due to changes in currency exchange rates.

5.17. Insolvency and liquidation

5.17.1. Insolvency

Insolvency occurs when a business is unable to meet a payment that is due.

This may result in a restructure of the businesses by a receiver, and the business may trade out of the situation and continue operating.

In general, however, this situation may result in the assets being sold and the business being wound up.

In the case of an individual this process is known as bankruptcy, while in the case of a business it is known as liquidation.

5.17.2. The risk of insolvency

The risk of insolvency occurring may be a significant risk in many business activities.

In the case of an individual, assets may often be sold and expenses may be reduced in times of low income or financial difficulty.

In the case of a business, however, both the assets and the expenses may be necessary in order to generate the business income.

A low level of sales, a complex and inefficient business structure, or a lack of effective products or services may lead to negative cash flow and eventually the liquidation of a business.

5.17.3. Conditions for insolvency

Insolvency occurs when a business cannot meet a payment that is due.

This situation may arise in various circumstances.

Negative cash flow

Negative cash flow involves money flowing out of the business at a larger rate than money is flowing into the business.

Negative cash flow does not imply insolvency, as long as there is sufficient cash available to pay expenses as they become due.

However, negative cash flow is an unsustainable situation, as the net assets of the business would eventually be reduced to zero.

Negative equity

Also, negative equity does not imply insolvency.

Negative equity, also known as negative net assets, occurs when the debts of the business are larger than the assets, and in theory the net value of the business is negative.

Negative equity may suggest that the business is experiencing serious financial problems.

In this situation, the interest expense may be high in proportion to operating income.

However, a business may continue operating with negative net assets, as long as there is sufficient cash to meet payments as they become due.

In the case of negative cash flow, the available cash reserves may eventually be reduced to zero, and the business may become insolvent.

In the case of positive cash flow, assets may accumulate within the business structure and the equity value may eventually become positive.

Cash balances

A business may have positive cash flow, positive net assets, and yet still become insolvent.

This could occur when a large payment is due, however there is insufficient cash available to meet the payment.

Insolvency may arise due to a lack of available cash, rather than a lack of assets.

5.17.4. Reasons for business failure

Businesses may cease to operate for a wide range of reasons.

However, some of the major causes may include some of the following items.

1. Excessive debt

Many business failures are associated with a high level of debt.

Other reasons such as slow sales may contribute to the final result, however the burden of debt payments may be the trigger that leads to the actual insolvency.

For example, debt may be raised to fund expansion.

The costs of marketing activities, expanding facilities and developing products may lead to the capital being consumed and few assets being created, however the size of the debt may remain unchanged.

In some situations, a period of slow sales may occur, and cash flow and asset values may decline.

Over time, the business may be left with a high debt level, few assets, and may be unable to meet debt payments as they become due.

2. Declining industries and uncompetitive products

While some areas of the economy and industries expand, others may decline over time.

For example, at the time of writing, manufacturing is in long-term decline, while service businesses are a growth area of the economy.

Businesses operating in declining industries may need to purchase other businesses and continually reinvest in updated production processes, in order to maintain sales levels and to ensure that costs remain below the price levels that may be set by the customer interest in the products.

3. Poor management

Business failures are often associated with poor management of the business operation.

Records may be poorly kept and information may be months out of date.

Basic accounting and business information may be stored in a range of different systems and may not be readily available, and transactions may be conducted on a random basis, rather than being part of a clear business direction.

4. High cost structures

In some business situations, high cost levels may lead to negative cash flow and eventually insolvency.

High costs may arise through some of the following circumstances.

- Outdated equipment and inefficient production processes.
- Excessive staff levels for the activities being performed.
- Distribution channels in which fees are received without significant benefit being added to the distribution process.
- Low volumes, leading to a lack of economies of scale, and fixed costs being spread across a small number of products or transactions.
- A poorly structured business operation, with duplicated and overlapping functions, and a range of functions being performed that do not result in an efficient business activity occurring.

5. Overly ambitious projects

In some situations, a business may initiate a project that is too large for the business to sustain.

For example, this may involve an overseas expansion, a large development project such as a new product, or general expansion at an excessive rate.

In these cases the project may be partially completed.

The business may have insufficient capital to complete the project, and the business may be liquidated, with the project never being completed.

5.17.5. Receivership

When a company is unable to meet payments that are due, a receiver may be is appointed to take control of the business.

This appointment is ordered by a court.

An application can be made to the court by a creditor of the company, which involves any party that is owed money by the business and where payment has not been made by the due date.

Also, a business may voluntarily request that a receiver be appointed.

The receiver may assess the condition of the business.

This process may lead to a decision to continue operating the business and attempt to trade out of the situation, or to order that the business be wound up and liquidated.

This assessment may be made quickly and may generally occur within a period of a few weeks.

The procedures for bankruptcy, receivership and liquidation are set out in detail in the commercial law legislation.

A decision to continue trading may only occur when the receiver came to the view that the business could continue to operate without incurring further debts, and when there was a reasonable chance that trading conditions would improve significantly.

If this was not the case, then a liquidator may be appointed to liquidate the business

5.17.6. Liquidation

Liquidation involves selling the assets of the business, repaying the debts of the business, and distributing any remaining funds to the business owners.

Secured debts are debts that are secured against a specific asset, such as a mortgage of a property.

Unsecured debts are all other debts of the business that are not secured against a specific asset.

The liquidator arranges the sale of the assets.

Secured creditors are repaid the full amount of the debt, if the sale of the secured asset raised a sufficient amount to repay the debt.

Any excess amount that is raised from the sale of an asset that is used as security for a debt is transferred into the general pool of funds.

If the amount of money that is raised from the sale of an asset that is used for security is not sufficient to repay the entire debt, then the remaining debt becomes part of the pool of unsecured debts.

After the asset sales have been completed, the available funds are used to repay the unsecured creditors on a pro-rata basis.

In general, the funds may be distributed so that each debt is repaid to the same level of percentage repayment as the other debts.

However, there may be some limited exceptions, such as the fact that the receiver's and liquidator's fees are paid in full before the funds are distributed to creditors.

Any additional funds that remain after the liquidation has been completed are distributed to the business owners on a pro-rata basis, according to their shareholding.

5.17.7. Avoiding Insolvency

The risk of insolvency occurring may be reduced by following a number of steps.

These may include some of the following issues.

Ensuring that assets are conservatively valued

This particularly applies to intangible assets such as brand names and licences.

Conservative valuations may prevent the business from taking on excessive debt or overly ambitious programs, due to unrealistic valuations placed on assets.

This also may also result in a realistic assessment being made of the funds that could be raised if asset sales were required.

Avoiding excessive debt

A business may deteriorate rapidly, with a business that appeared to be in a stable financial position deteriorating to near insolvency in a matter of months.

This may occur in situations such as a sharp drop in sales occurring, or may be due to an event such as an asset valuation write-down.

Many business operations require a certain level of debt in order to operate effectively.

However, high debt levels may present a constant risk to the business, and care should be taken in allowing a high debt level to persist without steps being taken to reduce the debt.

Managing the business effectively

Effective management may involve careful cost control, collection of debts, maintaining an efficient operation and developing new products and services for the future.

Maintaining adequate levels of cash

A business may cease to operate due to a short-term cash flow problem.

This may occur when the business operation itself is sound and would have continued to operate successfully, had it not been for a temporary cash flow problem.

Total asset values may involve many other assets in addition to available cash balances.

A business may have significant assets, such as equipment and facilities, however the business may become insolvent unless it maintains sufficient liquid assets to meet payments that may become due.

Liquid assets that may be accessible on short notice may include cash held in bank accounts, credit such as overdrafts, and tradable liquid assets such as shares.

Ensuring that margins are adequate

Narrow margins of net income to sales may present a risk to the business in the case of a sales decline.

This issue may particularly apply in the case where the costs are fixed costs that do not change with production levels, such as building rents.

Addressing cash flow as well as profit issues

A business may record a profit due to rising asset values, or booking a large number of credit sales, even through actual cash flow may be low.

Profit relates to the long term growth of the business, while survival and insolvency are primarily cash flow issues.

Taking action to stem negative cash flow

In some cases large negative cash flow may occur due to funding a project that has continued past the expected completion date, or an operation with large expenses and a low level of sales.

Situations such as these may need to be carefully monitored, and where necessary action may be needed to reduce or eliminate the outflow of funds, while these options are still available.

5.17.8. Liability for debts

In the case that insufficient funds are raised from asset sales to repay the debts in full, several situations may occur.

A company is a generally a limited liability structure.

In this situation, any remaining debts are cancelled.

The shareholders are then not liable to contribute additional funds towards the debts of the business.

In the case of a partnership or a business conducted in a personal name, the business owners may generally become personally liable for the remaining debts.

These debts would then be repaid from personal assets.

If this was not possible directly, then a personal bankruptcy may result.

In the case of a small enterprise, a bank may require director's guarantees before they are willing to loan money to the business.

A guarantee may apply to a specific loan, in which case the guarantor may be personal liable for that particular loan, but not for the remaining debts of the business.

In the case of a personal assets offered as security for a business loan, the personal asset may be sold to repay the loan, however any excess value from the asset sale, and other personal assets, would not be used to meet the business debts in the case of a company structure.

5.17.9. Bankruptcy

Personal bankruptcy follows a similar process to liquidation, with the individual's assets being sold and the proceeds being used to repay the outstanding debts.

In the case of bankruptcy, all income earned by the bankrupt for the following three years is also seized and distributed to creditors, although the individual may retain a small living allowance.

5.18. Risk and loss in business and investment

The possibility of loss is a fundamental element of business and investment.

In the case of lending, a chance may exist that the money that is lent may not be recovered in full.

In the case of a business enterprise, assets that are held within the business structure may be lost through a gradual decline in operating conditions, or in some cases through a sudden event such as the cancellation of a major customer order or a fire.

Operating a business as a company may allow personal assets to be kept separately from the business assets.

However, in the case of a business activity conducted in an individual's own name, a partnership, or personal guarantees, a decline in trading conditions may lead to all the individual's assets being lost, and eventually to bankruptcy.

In considering involvement in a business venture, the amount of the maximum loss that could be incurred, and the risk involved in the enterprise, may need to be carefully considered before a decision is made to proceed with a transaction or a business activity.

5.18.1. Guarantees

There is no such thing as a "guarantee" in an absolute sense.

A "guarantee" means that a person or organisation has made a certain statement.

When the time comes for the guarantee to be honoured, this may occur or it may not.

A guarantee may not be fulfilled because the other party cannot fulfil the guarantee, or it may not be fulfilled because they choose not to.

The closest situation to a reliable guarantee in the modern world may involve a payment that is guaranteed by a stable government with strong financial resources.

For example, an investment in a government bond carries a statement on behalf of the government that they will repay the principal on the due date.

However, even in this case the government itself may be unable or unwilling to carry out the action.

Although situations of this type may be rare, events of this nature do occur at times.

In 199X (**check year), the Russian government defaulted on payments on sovereign government bonds.

In the 1800's, (**check decade), the American government came close to bankruptcy, and the oil magnate JP Morgan injected funds into the government system in order to prevent the government from becoming insolvent.

In less dramatic circumstances, disputes may arise about the legal status of various transactions, and payments that were expected on a certain date may not be made.

An extended period of time may pass until court cases and negotiations result in payments being made that may have been due on earlier dates.

A government bond issued by a stable government may carry very little risk.

However, the principal remains that a "guarantee" is simply a statement that is made by another party, that they will perform a certain action in certain circumstances.

A bank deposit may generally be very safe.

In Australia, bank deposits are not guaranteed by the government.

However, the banking system is very stable and the failure of banks is very rare, although bank failures have occurred in previous times.

In the United States, bank deposits are insured by a federal insurance scheme, up to a maximum of US $100,000 for a single deposit. (** check details)

The term "guaranteed" is sometimes used with investment schemes and products.

This generally does not mean a government guarantee.

When this term is used, it may refer to the fact that the value of the investment will not fall, based on the standard operation of the product.

For example, the rate of return may vary from one month to another, but it will never be negative and the value will not decline.

However, this arrangement is backed by the resources of the insurance company or the party that arranges the investment.

In the case that the insurance company itself fails, part or all of the funds could be lost.

In seeking a highly safe investment, a government bond, or splitting the funds among several major banks may result in an investment with very little risk.

5.18.2. Money at risk

All money contributed to an investment is at risk.

Money that is loaned, money that is used to purchase an investment, and money that it contributed to a business venture could all be lost.

Some investments may carry a low risk of losing the entire investment value.

For example, investment in a property, investment in the shares of some companies, and lending money against a secured asset may all have a low risk of loosing the entire capital.

5.18.3. Liability exceeding the investment amount

In any lending or investment situation, a possibility generally exists that the full amount of the investment may be lost.

In some circumstances this amount may be the maximum amount that can be lost.

This may apply in some of the following circumstances.

- Lending money.
- Investing in shares in a company.
- Ownership of a physical asset.

In other circumstances, a party may be exposed to the chance of a loss that is larger than the amount of money that they invested in a business venture.

This may occur in some of the following circumstances.

- Business activities carried out as a partnership, or in the individual's own name.
- When personal guarantees are given for business debts.
- When personal assets are used as security for business loans.
- Passive investments in business enterprises, when the investor becomes legally part of a partnership, rather than owning shares in a company or being a lender.
- Financial markets derivatives instruments, such as futures and options.
- Geared financial transactions, where debt is raised to purchase an asset.

5.18.4. Status of business involvement

Clear documentation of loans and investment agreements may be used to identify the status of money transfers as loans or as equity investments.

In cases where money is transferred between business and personal accounts, or funds are contributed directly by investors without documentation, the status of funds may become unclear.

This may expose a party to additional risk in a business venture.

For example, a sum of money may be intended as a loan.

However, without clear documentation, a court may take the view that the individual has become a partner in a partnership enterprise.

In this situation, an individual may be personally liable for the entire debts of the enterprise, and may loose a larger amount than the funds that they intended to loan.

Documentation of loans and share ownership does not need to be complex or to use legal terminology, and a short statement of the purpose of a money transfer may be sufficient to determine whether an amount is a loan or an equity investment.

5.18.5. Secured Debt

Secured lending involves making a loan and holding an asset as security, such as a mortgage over a property.

A mortgage over an asset may involve a significant amount of documentation, and a solicitor may normally be consulted to draw up the relevant documents.

In the case that the borrower was unable or unwilling to repay the funds, the asset could be sold to recover the funds.

The use of security for a loan may reduce the risk of a substantial loss occurring through the loan funds not being recovered.

5.18.6. Passive investors

A passive investor contributes funds to a business enterprise but does not become involved in the operation of the business.

A passive investment may need to be carefully considered before it is undertaken.

The investor in this case may have limited knowledge of the business operation.

Large debts may be accumulated, and the business may be poorly managed, without the situation becoming clear until it is too late to prevent a liquidation from occurring.

Also, unless a loan or a company structure is used, a legal partnership may exist, and the investor may be exposed to a loss that is larger than their initial investment.

5.18.7. Debt Guarantees

In some cases, an investor may sign a bank guarantee, guaranteeing a loan.

In these situations, the person may become liable to repay the loan personally if the original borrower is unable or unwilling to meet the repayments.

5.18.8. Active business owners

In the case of active business owners, the best defence against the risk of loss may be the careful management of the business to prevent insolvency from occurring in the first place.

The use of a company structure may limit potential losses to the assets of the business, rather than extending to additional personal liability.

In the case of bank loans within small and medium sized businesses, banks may require personal guarantees before extending credit.

In practice there may be little that can be done to avoid this apart from avoiding debt completely, and in many situations a level of debt may be necessary to continue operating the business and to fund new projects.

5.18.9. Being sued

Apart from debt, the other major risk of financial loss may involve being sued.

This may involve another party taking legal action against the business or an individual to recover funds.

In the case of a breach of contract, the business may be sued by another party to a commercial arrangement.

For example, a project may be conducted or an item of equipment may be ordered, with the result that was delivered not matching the result that was expected.

Legal action may result in long time delays, high legal costs, and large payments being awarded against the business in the event of a lost case.

The risk of these situations arising may be reduced through some of the following steps.

- Ensuring that contracts and arrangements are supported by clear and detailed documentation.
- Checking with suppliers and customers on a regular basis to ensure that problems are not developing.
- Avoiding contract conditions which could lead to a large loss for the business if events occurred that were outside the control of the business, such as a supplier failing to supply an essential part for a machine.

Legal action may be taken against directors and trustees by shareholders or beneficiaries, on the basis of negligence in fulfilling the position of a director or a trustee.

The major defence against an action of this type may involve being able to demonstrate that the duties of the position where adequately carried out.

Legal action may be taken against the business by a customer, employee, or member of the public who suffers an injury in relation to the business activity, products or premises.

The major defence against an action of this type may be to demonstrate that an unsafe situation or product had not been created through the actions or the inaction of the business.

5.18.9.1. Legal action Insurance

In some cases, insurance may be used to reduce the risk of a large loss occurring as a result of a legal action.

Professional indemnity insurance may cover some situations involving being sued for negligence.

This insurance may be available for directors, trustees and professional occupations.

Public liability insurance may cover some situations involving injury to the public, such as a customer injuring themselves while in the business premises.

5.19. Industry Structure

The structure of an industry may have large impact on the possibilities for forming a new business that operates within the industry.

Industry structure may also affect the future directions that may be available to a business that operates within the industry.

5.19.1. Fragmented industries

Some industries may be highly fragmented, with a large number of separate small enterprises.

Many service industries that deal with the general public fall into this category.

Establishing a new business within a fragmented industry may be a relatively straightforward task.

This may involve operating as a sole trader, a partnership, or a small operation involving a traditional business structure.

Advertising or contacts from previous operation within an industry may be useful in some circumstances in establishing a client base.

A number of options may be available for growth within a fragmented industry.

Organic growth

The business may increase the number of employees or contract staff, and expand operations through increasing the volume of services or production.

However, expanding customer numbers using this approach in a fragmented industry may be a difficult option.

In these industries, economies of scale do not usually exist.

In the case of a manufacturing operation, the cost per unit generally declines as the volume of production is increased.

In a service business such as a property services business, however, the cost of providing the service may not alter significantly with the size of the business.

For example, a real estate agency that contracted 100 real estate agents may have a similar cost per hour of services to an agency that employed 10 agents.

In some cases, cost-per-transaction may actually increase as volumes rise, due to an increased difficulty with coordination in a large organisation, more complex and expensive administration systems, and so on.

Advertising and promotion to increase sales levels may involve considerable cost, and in the absence of economies of scale, the increase in sales may not be sufficient to offset the costs that may be involved in organic expansion.

Purchasing other businesses

Another alternative for expansion may involve buying another businesses or professional practice as a method of increasing the number of customers or clients.

This method may be used in professional service industries.

In this arrangement, a payment may be made to the purchased business to acquire the client base, the clients may be transferred to the buying business, and the operations of the purchased business may be integrated with the buying business.

Franchising

A third alternative may involve building a brand name and a presence within a market, and then creating a franchise business.

This may involve licensing the business name to independent operators, in return for an ongoing license fee.

This method may particularly apply to businesses that operate within a limited region, where the same activity is performed in many different places.

Home maintenance services and fast-food outlets may be examples of this type of business.

In the case of an established business in a fragmented industry, selling the business to a new operator, or to another business wishing to expand, may be a common exit strategy.

5.19.2. Concentrated industries

Some industries are highly concentrated, with a small number of organisations dominating the industry.

This may occur in capital-intensive industries, and in industries in which economies of scale occur.

For example, telecommunications services is a capital intensive industry, requiring large capital expenditure for equipment and facilities.

This industry is dominated by a few large companies.

Industries such as mining, manufacturing and banking may be affected by economies of scale.

In these cases, the cost per unit may fall as volumes increase.

This process may feed on itself, so that as volumes increase, costs and prices per unit continually decline, and eventually the industry consolidates into a small number of large companies.

Establishing a new business within a concentrated industry may be extremely difficult.

This may occur for several reasons.

Due to the massive economies of scale in large existing operations, a small new operation may not be able to produce goods for the same costs as the existing organisations, and so may not be able to offer equivalent or lower prices in order to attract customers.

Also, in these situations, agreements between customers, suppliers, and existing businesses may be tied up in long-term agreements.

This may make it difficult for a new business to establish a customer base due to existing agreements between customers and suppliers.

Several alternatives may be available in these cases.

A loss leader approach may be used to establish a presence within an industry.

This may involve selling products at below the cost of production, to build an initial customer base.

This option may require a substantial amount of capital to fund the loss on the initial sales.

This alternative may only be practical when there was enough capital available to create a sustainable level of sales, before the available capital for the business establishment process was exhausted.

Another alternative may involve establishing a niche operation, to perform an unusual service within the industry, or to focus on a small section of customers who were not serviced by the larger organisations.

This approach may be used to create a long-term operation directly.

Also, this approach may be used to establish a presence within an industry that may lead to the development of a more traditional range of products.

Operating a large business within a concentrated industry may involve maintaining the efficient operation of the business.

Options for growth mat include continued reduction of costs through continuous development of technology, expanding sales or operations to foreign regions, and using existing cash flow to fund new operations within other industries.

5.19.3. Consolidating industries

Some industries may pass through a consolidation phase during a certain period of time.

During this period, the industry may gradually move from being a fragmented industry with many small operations, to a concentrated industry with a few large companies.

The number of businesses may fall while the size of individual businesses may grow.

The consolidation process may involve some of the following activities.

- Businesses merging to form larger organisations.
- Businesses buying other businesses.
- Businesses declining in size and ceasing to operate, or withdrawing from the industry.

For example, at the time of writing the radiology industry in Australia is undergoing a consolidation phase (** check details).

Radiology involves X-rays and other medial scanning and imaging techniques.

This industry has traditionally been highly fragmented, and composed of a large number of small radiology practices.

Practices such as these may be operated as sole traders or partnerships.

The consolidation phase may involve a number of companies developing larger scale radiology businesses by buying a large number of individual practices and performing a large volume of services.

This industry also has significant capital requirements for equipment, which may provide an advantage to larger operations through cheaper funding of equipment compared to smaller enterprises, and possibly lower costs-per-unit from large scale equipment.

Operating in a consolidating industry may present a number of challenges.

When an industry consolidates, continuing operations under the same conditions as before may not be a viable option over the long term.

A business that continues to operate as a small enterprise may find that a few large low-cost organisations appear within the industry, and that it cannot

offer the same prices due to a higher cost per unit, caused by less economies of scale.

In these cases, a business may gradually loose customers, and may decline in size until it eventually ceases to operate.

Continuing to operate on an independent basis over the long term may be possible in some cases, although this may lead to very low profitability and a business that survives at a subsistence level.

In other cases this may not be practical and the flow of customers may simply disappear.

Several options may be available in these circumstances.

A business could merge with another organisation.

This approach may have the benefit of retaining some independence, while still increasing the size of the business to the point that the business operation may be sustainable over the long term.

Alternatively, the business may purchase other businesses to expand in size and maintain a sustainable operation.

However, this approach may lead to a more traditional business operation, which may not be the interest of the original business operators.

Also, the business may accept an offer of purchase from one of the expanding organisations.

Following a sale, the business owner could continue to operate on a contract basis, or could withdraw from the industry.

5.19.4. High growth industries

High growth industries may involve rapidly rising levels of sales, and increasing volumes of production or service delivery.

Rapid expansion is not sustainable on a long term basis, and these periods may end in a crash, or with the industry stabilising at a certain size.

Following the period of rapid growth, a crash may lead to sales falling to a low level.

Alternatively, sales may stabilise at a particular level, and growth rates may fall to sustainable levels.

Examples of rapid expansion may include the Nickel mining boom of the 1970's (**check decade) and the Internet boom of the 1990s.

Operating in a high growth industry may present many opportunities, but may also involve significant problems and risks.

Forming a new business within a high growth industry may be relatively straightforward.

An individual or a small group that has considerable experience within an industry may compile a business plan, issue a prospectus, and raise money in a public float.

The capital may then be used to hire employees and attempt to develop products and generate income.

Another scenario may involve a company that operates in a traditional low-growth industry investing a sum of capital to set up a new independent operation within the high growth industry.

Operating within a high growth industry may involve a rapid increase in customer numbers and strongly rising sales.

However, this may also be an extremely competitive environment.

Many new companies may be formed and competition for customers may be intense.

In these situations, businesses may need to develop new products at a rapid rate to remain at the front of development of the industry, and to avoid falling behind and ceasing to operate as customers are lost to competitors.

In high growth environments, the life cycle of products may be measured in months rather than years.

Companies in a high growth environment may operate with negative cash flow.

Large research and product development teams may be set up, and large amounts of capital may be spent developing new products and expanding facilities.

The income from sales may not be sufficient to cover this cash outflow.

In these situations, the company may raise additional capital from public share issues on a regular basis.

In the case of operations set up by existing companies, lump sums of capital may be transferred into the new business as the existing capital is consumed.

Alternatively, the new business may be funded using cash flow from the existing business operations.

Management of a business within a high growth industry may involve several issues.

The business may need to develop new products and facilities continually to remain at the front of the industry, otherwise the business may fall behind the development of the industry, and eventually close.

Negative cash flow and regular capital raisings may be inevitable, and may be accepted as part of the expansion phase.

This may not present a difficulty as long as the boom conditions continue.

The business may need to carefully prepare for the crash or rapid slowing that will inevitably occur.

After this time, the business may need to operate with positive cash flow in order to survive.

Raising additional capital may not be possible following a crash or a rapid slowing of activity within an industry.

Preparing for the transition to a smaller sustainable business may be difficult, and many companies may close and be liquidated when a crash finally occurs.

However, by planning a scenario for the transition, while continuing to survive the rapid expansion without falling behind competitors, the business may be able to continue operating on a long term basis.

5.19.5. Declining industries

Declining industries may experience falling sales and profits over a long period of time.

This may typically occur when there is a fixed underlying demand for a product, and technology improvements may enable the product to be produced with fewer and fewer resources as time goes by.

For example, the trade of a cobbler, involving the making and repairing of shoes, was once a common trade but is almost unknown in the modern world.

As an industry declines due to improved technology, resources may be focused in other directions and new industries may emerge.

Operating in a declining industry may involve increasing volumes in order to maintain profitable.

In cases where new technology is being used, the business may need to keep up to date with the implementation of new technology, otherwise it may gradually loose sales and eventually become insolvent.

A sale to a competitor and exiting an industry may be one possible approach in the case of a business that operates in a declining industry.

Cost control may be an important issue in these cases, and margins may be slim as prices may need to be reduced in order to slow the decline in sales volumes.

In these situations, many businesses may be available for sale, with low prices and little time pressure due to the gradually declining nature of the industry.

Purchasing other businesses to expand size and reduce costs through economies of scale may be an option for continued successful operation within the industry.

5.20. Project development

Project development involves planning, managing, and funding a project.

A project is any activity that operates for a fixed period of time and produces a specific result, rather than an activity that operates on a continuous basis.

The Snowy Mountains Scheme is an example of a large engineering project.

This scheme was one of the largest civil engineering projects of the modern age.

This project involved redirecting water from the Snowy Mountains to irrigate the farming plains of Victoria and New South Wales

The project involved building dozens of dams, hundreds of kilometres of pipeline, employed thousands of workers and took over ten years to complete (**check details).

5.20.1. Types of project

Projects may occur within business operations in a number of circumstances.

Projects may be used to develop new products and build new facilities.

The development of large items such as commercial buildings, mines, computer software and film production may be organised on a project basis.

Projects may be internal to the business, or they may be developed for clients or for later sale.

5.20.2. Project proposals

In some cases, the requirements for a project may be clearly specified.

In this situation, the project may proceed through the stages of design and construction.

In the case of tenders for a project development, a basic project design and set of costs and time frames may be estimated in order to prepare a tender for submission to a potential client.

In other situations, a project may be based on a general requirement or a set of broad ideas.

In these situations, basic designs, sample products, scale models and prototype systems or items may be created to enable a firm design to be developed.

5.20.3. Managing the project

Managing a project may involve some of the following issues.

- Co-ordinating the various activities to ensure that the project is completed according to the scheduled time frames.
- Ensuring that the project is completed with costs being in line with the project plan.
- Ensuring that the finished product matches the product that was ordered or designed.

5.20.3.1. Development of a project plan

The first task in the development of a project may involve defining the requirements and specification of the item to be developed.

In some situations a specification may be provided by a client.

In other situations, such as internal projects, the project may be based on some very general ideas and directions.

In the case of a clear and detailed specification, the first stage may involve developing a project plan, and estimating the major tasks, materials, and time schedules that may be involved in developing the item.

In the case of external clients, this may lead to the development of a tender or a project proposal that may be submitted to the client.

In the case of internal projects, the project plan may be used to make a decision as to whether to proceed with the project or not.

In large organisations this decision may be made by the manager responsible for the particular area, or in the case of larger projects, by a capital expenditure committee or the board of directors.

In the case of a small or individual enterprise, the business owner may make the decision as to whether to proceed with the project or not.

This may also be the person who prepared the project plan, or the project plan may be prepared by another party, either internally to the company or externally.

5.20.3.2. Project plans

The project plan may include the costs and requirements for the project, along with a detailed project schedule.

A project schedule may include a list of the tasks and time frames, the order that the tasks need to be completed in, and the dependences between different parts of the project.

In many cases, some parts of a project may not be able to be started until other sections of the project have been completed.

In larger projects, many separate activities may occur concurrently.

In these cases, and the dependencies between tasks may need to be managed to ensure that some tasks are not delayed for long periods due to other sections not being completed.

In addition to planning the order and timing of the tasks, the materials needed for the project may also be specified.

5.20.3.3. Managing the project

Managing the project may involve assembling teams of employees or contractors, and assigning the various tasks to teams of individuals.

As the project progresses, some tasks take a longer or shorter time to complete than was expected, and tasks may need to be re-scheduled and transferred between teams in order to ensure that development continues to progress smoothly.

In some cases, it may become clear mid-way through a project that the project will not be completed by the due date, or that significant increases in costs above estimates will be involved.

In these cases, this problem should generally be raised at the earliest possible time.

This may allow alternative plans to be made in advance as required, without the problems appearing at a time that is close to the expected completion date.

Also, multiple extensions to a project deadline may lead to a severe deterioration in the relationship between the business and the client or other parties.

When an alteration is made to a project deadline or budget, one alternative may involve making a single large alteration on a single occasion.

While this may not be well received, this may be preferred to continual small extensions to the completion date without any clear end in sight.

However, if this step is taken, then the second completion date may become much more significant, and a second postponement may prove fatal for future orders from the client.

5.20.3.4. Design and Construction

In some cases a project may be broken into two major stages; design and construction.

This may apply in cases such as building or constructing a specific item, rather than projects that involve a new development such as product development or research.

The design stage may involve relatively few resources, but may involve a considerable period of time.

The time period involved in design may not be significantly reduced by allocating additional resources to the project.

In contrast, the time involved in the construction phase may be directly related to the resources allocated to the project.

Allocating a large number of resources to a project for a short period of time may lead to several benefits.

Although this may not reduce the total work or costs involved in construction, this approach may reduce the fixed cost of the project, such as interest costs and the costs of temporary facilities.

Also, this approach may reduce the risk of circumstances changing or opportunities being lost due to a long time delay in the completion of the project.

A preliminary design stage may need to be completed in order to prepare the basic project plan, and to estimate the time and cost involved in completing the project.

After the full design is completed, a detailed project plan of individual tasks and materials may be created, and full construction may begin.

5.20.3.5. Reducing development times

A number of benefits may arise from completing a project within a short period of time.

The may involve some of the following points.

- Reduced interest costs on debt used to fund the project expenses.
- A reduction in the income that may be lost through not being able to use the project facilities until the project is completed.
- A reduction in the cost of arranging temporary facilities, such as temporary equipment, or large-scale manual processing of administration.
- A reduced chance that changes in circumstances may lead to the project failing to be completed, or no longer being relevant by the time that it is finally completed.
- A reduced chance of missing opportunities that may only be available for a limited period of time, such as activities related to specific events, activities related to fashion or popular products within an industry, and so on.

Large projects may run for several years, and in some cases the previous points may have a significant impact on the business.

A number of approaches may be used to reduce the development times for a project.

This may include some of the following points.

5.20.3.5.1. Large resource allocations

In some cases, particularly during the construction phases of a project, rather than the design phases, allocating a large number of resources to a project may reduce the development times.

This may involve using contract staff, external service businesses, or using internal employees or facilities that may be involved in other areas for a limited period of time.

The possibility of using large resource allocations may also be a potential benefit with the use of external services for the development of large projects, in situations where a limited set of internal resources may lead to long time delays being involved in the development of large projects.

This process may not alter the total amount of work that may be involved in completing the project.

However, reducing the project development time may reduce the total costs of the project through reduced interest costs, lease payments and so on.

5.20.3.5.2. Parallel processes

In some cases, several areas within a project may be completed concurrently, rather than being completed in a sequence.

This process may require additional resources, although this may also reduce the project development time.

In contrast, completing each part of the project in order, one stage after the other, may lead to a long development time.

Managing or developing a project that involves many parallel processes may be more difficult that managing a sequential process.

A significant amount of co-ordination between different activities may be necessary to ensure that tasks are not commenced before other tasks that must be completed first, and that tasks are not delayed while waiting for other tasks to complete.

5.20.3.5.3. Multiple projects

In some cases, delays at various points within a project may be unavoidable.

This may involve waiting for external supplies, waiting for client reviews, waiting for stages to be completed by external parties, and so on.

In the case of operating several projects simultaneously, overlapping the project work from each project may allow these gaps to be filled with the development of other projects.

This process may result in the total time that is required to complete all the projects being reduced, in comparison to developing each project in sequence.

5.20.4. Directions vs. Development

Some projects may begin with a specific research or development goal, and may gradually change to become a permanent part of the business operation.

These projects may prove to be a large drain on the cash flow of the business.

Although in some cases a business area such as this may regularly produce useful specific items, such as completed product designs, in other cases a substantial operation may continue for a long period of time without producing anything that is of practical use to the business.

This may involve developments in various directions that change continually over time, without progressing to the stage of completing a specific working item.

This situation may particularly occur in the case of an overly ambitious project.

A project such as this may degenerate into a permanent research process that does not bring any specific ideas or products to the stage of completion.

The risk of problems such as this arising may be reduced by initiating small projects with specific goals and timeframes, rather than commencing large and ambitious projects that may never complete.

5.20.5. Project Financing

5.20.5.1. Funding

Funding a project may be a major issue in many business circumstances.

In many cases, income may not be received from the results of a project until after the project has been completed.

Large projects may run for several years.

Funding a project may be done on a capital or a cash flow basis.

Capital funding may involve raising a lump sum of money at the beginning of the project to pay the project expenses for the duration of the project.

This capital may come from raising debt, from raising equity from a public share issue, from the general capital of the business, or from a customer who arranges for a project item to be created.

Cash flow funding of a project may involve drawing cash flow from the other operations of the business, or from progress payments made by a customer at stages through the project.

In other cases, the expenses of the project may be billed directly to a customer, with the business collecting a fee for the design and management of the project.

Interest on project debt may sometimes be capitalised during the project development, in cases where the income from the project may not be received until after the project has been completed.

Capitalisation of interest may involve interest amounts being added to the current balance of the debt as the project proceeds, rather than cash payments of interest being made through the development period.

5.20.5.2. Income

Income from a completed project may flow in a number of ways.

The completed project may be sold at the end of the development period, either to a customer that initially requested the item, or as a general sale of the finished product.

This situation may apply to the development of construction projects and customised software developed for a specific client, for example.

Alternatively, the completed project may be retained by the business, and used to generate a long term income stream.

This may be the case in product development, for example.

Payment for a project by a client may be made through instalments during the development process, either at regular times or as particular milestones are reached or stages are completed.

Payment can also occur as a lump sum when the project has been completed.

In some circumstances, large payments may become due, and the risk of default on a payment may present a considerable risk to the business.

For example, the builder of a commercial office building may not wish to complete the building in case the client cannot pay for the building at the end of the project.

However, the client may not wish to pay in advance, in case the builder does not complete the building.

A situation such as this may be handled using an escrow account.

An escrow account is held in the name of a third party, such as a commercial trustee.

In this example, the client may deposit the funds in the escrow account, and the builder may then commence the construction.

When the construction was complete, the funds may be released from the escrow account to the builder.

Escrow accounts are sometimes used in large commercial transactions.

5.20.5.3. Managing cash flow

Managing the cash flow of a project may be fairly straightforward when the project is financed by a lump sum that is raised at the beginning of the project.

The initial capital may be placed on deposit, and funds may be drawn down to pay expenses as the project progresses.

In the case where the project is funded on a cash flow basis, a schedule of expected income and expense amounts and the dates of each transaction may be prepared.

For example, project expenses may be budgeted on a monthly basis, while the client may make six-monthly progress payments.

A buffer of capital, or a debt facility such as an overdraft, may be needed to handle situations where the net ongoing balance is negative, due to an expense having to be paid before an income amount is received.

5.20.5.4. Future income and expenses

In the case of short term projects, the income and expenses may be simply added and subtracted to determine the net income or loss from the project.

When the expenses or income from a project may extend for more than two or three years, a different approach that allows for the time value of money may be needed.

This issue is discussed in detail in section beginning on page 734.

As an example, the expenses for the third year of a project may be budgeted to be $10.

However, the initial capital deposit may earn interest over the three year period.

This means that less than $10 may need to be set aside to meet the payment that was due in three year's time.

An amount of $9, for example, may be allocated at the start of the project, and may grow with interest to equal the $10 payment that may be due in the third year.

This is the principle of the time value of money, and applies to all transactions that occur at different points in time.

A "present value" calculation may be used to convert a future income or expense amount to an equivalent value at an earlier date.

The following formula may be used to calculate the present value of a future cash flow that may occur in several year's time.

$$\text{present value} = \frac{\text{amount}}{\left(1 + \frac{\text{interest rate}}{100}\right)^{\text{number of years}}}$$

For example, if the interest rate was 10%, an amount of $20 in three years time could be converted to an equivalent amount on the current date using the following calculation

$$\text{present value} = \frac{20}{\left(1 + \frac{10}{100}\right)^{3}}$$

$$= \$15.03$$

In cases where the project financing calculations may extend over more than two or three years, including either income or expense amounts, the present value of each payment may be used to determine the total costs of the project, and the expected effective income.

For example, the following example lists a schedule of costs over quarterly periods for a three year development project, together with the total effective cost of the project.

Interest Rate		8%		
Year	Quarter	Amount	Periods	Present Value
1	1	10	0.00	10.00
1	2	10	0.25	9.81
1	3	10	0.50	9.62
1	4	10	0.75	9.44
2	1	10	1.00	9.26
2	2	10	1.25	9.08
2	3	10	1.50	8.91
2	4	10	1.75	8.74
3	1	10	2.00	8.57
3	2	10	2.25	8.41
3	3	10	2.50	8.25
3	4	10	2.75	8.09
Total value of costs		120.00		108.19

In this example, total expense payments of $120 may be made through the course of the project, however only $108 of capital may need to be raised to fund the project.

5.20.5.5. Project returns

In the case of long-term income and expense calculations, several approaches may be used to determine the net value of a project.

An “internal rate of return” calculation may be used to determine a rate of return from a project.

This method may involve calculating the present value of all future income and expense amounts, and determining the interest rate that results in the total of the present values being zero.

This figure may be interpreted as a rate of return from the project.

This calculation may be performed using a spreadsheet program, entering estimated income and expenses for each future period, and using a goal-seeking function to determine the relevant discount rate that sets the net present value of all payments to zero.

This discount rate is known as the internal rate of return of the cash flows.

Although an internal rate of return calculation may produce a result that can be interpreted as a percentage return from the project, there may also be limitations with this approach.

In cases where the cash flows may change sign at several stages through the project, changing from net inflows to net outflows, the IRR calculation may produce several very different results that are all mathematically correct.

Also, the IRR figure may only represent an investment return for the full capital investment where early income amounts could be re-invested at a similar rate to the internal rate of return.

Another approach may involve calculating a net-present-value for the project.

In this situation, a discount rate may be selected based on the risk of the project, or based on a hurdle rate that was used within an organisation for assessing projects.

The net present value that was calculated using this approach may then represent the dollar value of the project.

In cases where the net present value figure was positive, this may represent a project return that exceeded the hurdle rate of return.

(** Appendix XX contains an example of a project cash flow and return analysis.)

A net-present-value approach may also be used to select pricing for tenders and project proposals.

In these situations, a standard discount rate could be used, and the net-present-value of the project could be used as the quoted price to complete the project development.

This method may allow a standard pricing approach to be used for a wide range of different projects.

A net-present-value or internal-rate-of-return calculation may only be applicable in cases where the income that may be generated from the project could be directly estimated.

In the case of general projects, such as marketing campaigns or research into new product areas, the benefits of a project may need to be assessed on the basis of the project's impact on the business operations, rather than estimating specific future amounts.

5.20.5.6. Summary of project financing alternatives

The following arrangements may include some possible alternatives for the financing of project developments.

Funding

Capital funding

- Debt raising.
- Specific equity capital raising.
- Capital sourced from the general capital of the business.
- A sale of each project stage as it is completed to fund the next project stage.

Cash flow funding

- Cash flow sourced from existing business operations.

- Progress payments from clients, at fixed intervals or as project stages are completed or milestones are reached.
- Expenses billed directly to the client.

Income

Capital payments

- Lump sum payment from the client and the beginning or end of the project.
- Sale of the completed project at the end of the project.

Cash flow

- Progress payments from a client.
- Income from long-term sales of a product following the completion of the project.
- A long-term income stream of licence fees for licensing a design or technology development.

Returns

- Internal rate of return of the project cash flows.
- Net present value using a risk-adjusted discount rate to determine a dollar value for a project.
- Net present value using a hurdle rate of return, to determine where a project return exceeds the hurdle rate.

5.21. Managing negative cash flow

Negative cash flow occurs when the funds that are flowing out of the business in expense and capital payments are flowing at a higher rate than the inflow of cash from sales.

Negative case flow may occur due to a temporary drop in sales, during the development phase of a project, and in seasonal industries.

A business may need to be carefully managed during a time of negative cash flow.

A period of negative cash flow may be a regular part of the business activity.

However, negative cash flow may involve a steady decline in the net assets of the business.

In this situation, the business may operate with a fixed period of time until insolvency occurs.

During a period of negative cash flow, the business may need to be managed carefully to ensure that the business survives until cash flow becomes positive, without becoming insolvent.

Negative cash flow may occur in some of the following circumstances:

5.21.1. Causes of negative cash flow

5.21.1.1. Poor operating conditions

Negative cash flow may occur when sales are low due to low levels of economic activity, or due to issues such as production problems or rapid expansion by a competitor.

In the case of temporary problems, expenses may need to be postponed or reduced in order for the business to survive until positive cash flow is restored.

In the case of permanent structural problems with the business, larger changes may be needed to change the business into a sustainable operation, such as discontinuing large projects or loss-making operations and products, and investing in new products or facilities.

5.21.1.2. The development phase of a project

During the development phase of a project, expenses may need to be paid, even through income may not be received until after the project has been completed.

In this situation, the business may need to ensure that it has sufficient available cash to complete the project.

In this is not the case, additional cash may need to be raised through asset sales or raising debt or equity, the project may be discontinued or sold to another business, or a joint venture with another business may be arranged to complete the project.

Project management may be important in this situation, to ensure that the project is completed according to the project schedule, and within the cost budget.

5.21.1.3. Rapid expansion

Negative cash flow may occur during a period of rapid expansion.

In this situation, the costs of new facilities and expanded operations may be larger than the income from sales.

This may occur, for example, in the case of a successful product or service, or in the case of a rapidly expanding industry.

Rapid expansion may require periodically raising additional equity capital.

However, this process may need to be carefully managed, as a business may become insolvent during periods of rapid expansion, due to having insufficient cash reserves to meet increased expense levels.

5.21.1.4. Seasonal industries

In some industries, sales may occur at particular times of the year.

For example, in some retail operations, half the annual sales may occur during the month of December.

In the case of some agricultural products, income may occur once a year following the harvest season.

5.21.1.5. Cyclical industries

Some industries may be cyclical, and may have periods of strong activity followed by long periods of little activity.

The sale of consumer durable items, such as whitegoods, may be an example of this situation. (** check details)

In these cases, negative cash flow may occur during periods of low activity.

5.21.1.6. Development activities

In some cases, a sum of capital may be raised to perform a development activity.

For example, in the mining industry, a sum of capital may be raised to conduct mining exploration, and to attempt to locate an ore body and develop a mining operation.

In the case of a high growth industry, equity capital may be raised to create a new business.

This capital may be used to develop new products, and to attempt to develop a sustainable client base or a sustainable level of sales.

In situations such as this, cash flow may be negative from the moment that the equity funds are raised, until a sustainable operation is created.

In some cases, several equity raisings may be conducted until a sustainable operation is developed, or in other cases, the equity capital may be consumed without establishing a sustainable operation, and the business activity may be dissolved.

5.21.2. Managing negative cash flow

5.21.2.1. Cash levels

In the case of seasonal and cyclical business, a level of cash may need to be maintained in order to pay expenses during periods where income is not sufficient to pay expenses.

Cash levels may be maintained from previous net profit, or additional equity funds may be raised in some circumstances.

However, the option of retaining cash or raising equity may only be available before, rather than during, the period of negative cash flow.

In this situation, preparation in advance may be required for the business to be able to pass through a period of negative cash flow without becoming insolvent.

This may particularly apply in the case of unexpected negative cash flow, such as negative cash flow caused by a sharp drop in the level of economic activity.

5.21.2.2. Time periods

In a situation of negative cash flow, a fixed period of time is available until the business may become insolvent.

This time period can be calculated using the following formula.

$$\text{months remaining} = \frac{\text{available cash value}}{\text{net monthly outflow}}$$

For example, a business may have income of $10 per month and expenses of $12 per month, for a net monthly outflow of $2 per month.

If the business had $28 of cash reserves, the period of time until the business become insolvent could be calculated using the following example.

$$\text{months remaining} = \frac{28}{2}$$

$$= 14 \text{ months}$$

The time period remaining until insolvency may occur may be extended by increasing cash levels through asset sales or equity raisings, reducing the rate of outflow, or a combination of both.

For example, if the rate of monthly outflow was reduced to $1.50, and the cash level was increased to $35, the time period remaining until insolvency could be re-calculated using the following example.

$$\text{months remaining} = \frac{35}{1.5}$$

$$= 23 \text{ months}$$

5.21.2.3. Reducing negative cash flow

A number of steps may be taken that may reduce the magnitude of negative cash flow and the duration of a negative cash flow period.

This may include some of the following approaches.

Postponing expenses

In cases of negative cash flow, major expenses such as capital purchases of equipment, product development projects, and so on may be postponed.

However, expenses of this type may be necessary in order to ensure the long term survival of the business.

In cases where capital expenses cannot be funded for an extended period of time, alternative action may need to be taken.

For example, loss-making products could be discontinued, and additional equity or debt could be raised to fund capital projects and to develop a sustainable business operation.

Reducing expenses

Reducing expenses may be one alternative for reducing negative cash flow.

This may involve reducing staff numbers, where the capacity of the business is higher than the customer demand for products or services.

In other cases, labour-intensive processes or out-dated equipment may be replaced with updated facilities that allow more efficient operation and lower costs-per-unit.

However, changes of this type may require raising capital to fund equipment purchases and new developments, and this may be difficult during periods of negative cash flow.

Reducing expenses may reduce both the size of the net cash outflow and the duration of a negative cash flow period, due to a smaller rise in sales being necessary to restore positive cash flow.

Reducing expenses may also have the benefit of reducing the rate of decline in the net assets of the business, in contrast to other approaches such as asset sales and changing income structures, which may simply restructure the financial arrangements without reducing the rate of asset decline.

Income receipts

In some cases, negative cash flow problems may be reduced by changing the structure of income that is received.

For example, some of the following approaches could be used to derive income at earlier stages in a project, and to spread income cash flow into several small payments, rather than occasional large payments.

- Progress payments at regular intervals through a project, rather than a lump sum payment at the end of the project.
- Deposits paid by customers when orders are placed for product purchases.

- Pre-sales of project developments, with customers purchasing an item before construction is carried out, and making partial payments than may be used to meet construction expenses

- Completing a project in stages, with sales or payment occurring after each stage, rather than attempting to fund the complete development of a large project.

- Reducing the length of credit terms offered to customers.

- The used of a factoring service, or bank bills to enable funds to be raised immediately from customer accounts that may not be due for payment for a period of time.

5.21.2.4. Fixed and variable costs

A business that has a high proportion of fixed costs may be at greater risk of negative cash flow that a business that has a high proportion of variable costs.

Fixed costs must be paid regardless of the level of production or sales, while variable costs may decline during a period of low sales.

The proportion of variable costs may be increased in some circumstances by using some of the following approaches.

- Using external rather than internal service areas, where the volume of services and payments can be increased or decreased to match changes in sales levels.

- Maintaining a combination of permanent, temporary and contract employment arrangements, in order to enable staff levels to be effectively managed during periods of high and low sales.

- Ensuring that service and product delivery is charged on a per-transaction basis, rather than a fixed dollar amount basis.

- Avoiding supply agreements that involve a requirement to accept delivery of a fixed or a minimum volume of products on a regular basis.

5.21.2.5. Alternative operations

In the case of seasonal and cyclical businesses, negative cash flow problems may be reduced through the business conducting two or more separate business activities.

This may not have a significant effect on cash flow patterns when the activities are related to the same industry or seasonal cycle.

However, in other cases this approach may have a significant impact on the length and severity of negative cash flow periods.

For example, a retail outlet that sold winter skiing equipment may also sell waterskiing equipment during the summer months, to reduce problems that may arise due to long periods of time passing without income being received due to seasonal effects.

In the case of a cyclical industry such as building construction, launching a second product range or set of services that were not related to the construction industry may reduce problems that may arise during periods of low activity.

5.22. Options

An option is a situation in which a business has a choice.

This may particularly apply to contracts in which the business may exercise a choice.

For example, standard options contracts are traded on stock and futures exchanges.

These options may allow the business to purchase or sell a specified quantity of a commodity, and a fixed price, for a specified period of time.

The option holder may exercise the option, in which case the specified transaction may go ahead, or allow the option to lapse, in which case no transaction occurs.

Options may be used within commercial property leases, for example.

A property lease may specify a term of three years, with an option to extend the lease for a further three years at the end of the first three-year period.

In contracts and other situations containing options, the holder of the option may chose between two or more alternatives.

The party granting the option must accept the choice that is made by the option holder.

Options may be valuable.

An option may give the business flexibility, and may allow it to adapt to changing circumstances.

Also, an option cannot have negative value.

In the business context, and option may provide additional alternatives and may add flexibility to the business operations.

Not all options may be useful, however adding options cannot reduce the value of a transaction or other business situation

5.22.1. Contracts

In the earlier example, the lease with the three year term and the three year option may be more useful to the business than either a fixed three-year or a fixed six-year lease.

In all three cases, the lease term includes the first three years.

However, with a three year lease, the business may not have the alternative of remaining in the premises if the owner does not offer to renew the lease.

In the case of a six year lease, the business may not have the alternative of ending the occupancy at the end of the first three years.

With the option lease, however, the business may have the choice at the end of the first three years to remain in the property for another three years, or to move to alternative premises.

Options may also be used in contracts with customers and suppliers.

For example, a customer supply agreement may include a minimum monthly delivery volume, with the option for the customer to select an increased volume for the month up to a certain limit.

In this case the business is granting, rather than receiving, an option.

This may be costly to the business in some cases, as the business must be able to handle orders for either large or small volumes, rather than fixed small or fixed large volumes.

This may require maintaining facilities to support large volumes that may be unused if the customer order is small, or maintaining fixed facilities for small volumes that may require additional temporary facilities if orders are large.

However, as this option may be valuable to the customer, it may enable the business to maintain higher average price levels, or could be used as a marketing subsidy to increase sales volumes.

5.22.2. Staged projects

Large development projects may sometimes be broken up into several independent stages.

This process may add value to a project.

By breaking a project into stages, the number of possible future directions for the project development may be increased.

A staged project development may allow a decision to be made on a future date, when circumstances may have changed.

For example, a business may be unable to fund the development of a large project without receiving income.

However, it may have sufficient funds to complete a single stage, sell the completed stage, and then use the income from the sale to complete the next stage.

Also, a considerable period of time may pass until a stage is completed.

Circumstances may have changed by the time that a stage is completed, such as a drop in market prices or customer interest, or an increase in raw materials prices.

A staged project may allow further stages to be postponed, or alternatively the project could be ended with the stages that had already been completed.

In the case of a full development that required all parts of the project to be completed, losses may occur if capital levels were insufficient to complete the project, or conditions changed substantially over the course of the project.

5.22.3. Listed options

Options may be used in some financial markets instruments.

These contracts may be traded in a similar way to shares, and may be known as equity options, fixed interest options, foreign exchange options, or simply "options".

For example, a business may submit a tender for a development project.

Developing the project may require a large debt raising to purchase raw materials for construction.

However, interest rates may rise before the tender selection is made, and before the business can determine whether to arrange a debt raising or not.

In some development situations involving large costs with slim margins, a small change in interest rates may have a large impact on the net profit from a project.

A situation such as this may be handled using a fixed interest option.

This may give the business the ability to draw down a loan on a future date, with the interest rate to be set to the current interest rate rather than a future interest rate.

As another example, a foreign exchange option may give the business the option to convert $10 of currency A to currency B, at the current exchange rate of 0.73, at any time within the next six months.

Valuation

In some circumstances, a value can be calculated for an option.

The pricing of options is discussed in the section beginning on page 707.

In cases where options apply to prices, such as an option that allows a certain volume of a commodity to be purchased at a fixed price, a value for an option may be calculated from the volatility of the market price of the underlying commodity.

In the case of projects and other situations, a model of the financial structure of the situation could be developed, and a computer simulation approach could be used to estimate a value for an option.

5.22.4. Zero-sum options

An option may involve a direct financial transfer from one party to the other at the expiry of the option.

For example, an option that was based on a volatile market price may result in a transfer from one party to the other at the completion of the option period.

In this case, a financial benefit may not be gained or lost by purchasing or granting an option.

The price of an option may be based on the probability of a profit occurring, with the average profit or loss from an option transaction cancelling to zero over a large number of transactions.

However, options such as these may be useful in reducing the risk to the business of a large adverse price change, and in managing cash flow.

In other situations, an option may have a greater cost or benefit to one party than the other.

When this occurs, additional value may be created by including options within contracts.

For example, a cost may not be involved in converting a large project into a staged project, however additional value may be created through creating options within the project development.

As another example, an option within a commercial property lease may have more benefit to the business than the cost to the building owner.

For example, moving premises may be a difficult and expensive process for the business, however changing tenants may have little affect on the building owner.

In situations such as these, creating options may create value that may result in an increase in sales volumes or an increase in sustainable price levels.

5.23. Business Practices

5.23.1. Direct Investigation

When a situation is unclear and further information may be needed, directly investigating the situation may the most accurate way of clarifying the situation in question.

Statements made by other parties may be misleading.

In some cases this may be intentional.

In other situations, misleading information may occur due to misunderstandings, information that applies to a different situation that the situation being discussed, or information that was once correct but no longer applies.

In some cases accurate information may be supplied.

However, relying on statements made by other parties may not lead to the same level of understanding, or the same opportunity to form a clear view, as a situation in which the business investigates the situation and locates the information personally.

Understandings of the business owner themselves may later turn out to have been incorrect.

However, it is only possible to move forward with the best information that is available at any particular point in time.

Decisions may need to be made at each point in time based on the available information, in the full knowledge that information that is believed to be accurate may later turn out to be incorrect.

Sourcing information directly, rather than relying on statements made by other parties, may avoid many possible problems with the operation and development of a business.

In extreme cases, a closure and liquidation of a business may occur if a large transaction is commenced, and the transaction cannot be completed due a situation is which actions were taken on the basis of information that was supplied by another party, when in fact the information was incorrect.

5.23.2. Reliability

Reliability may be very important in business.

For example, a machine cannot generally be shipped until every individual part has been assembled.

In an extreme example, a machine with a large capital value may be held for months without shipment due to the unavailability of a part costing only a few dollars.

This may lead to additional costs in interest payments, default on delivery dates for customer orders, and a serious disruption to the business operation.

Ensuring a reliable supply of materials may be a significant issue in the management of a business operation.

Although cost and quality may be important issues, reliability of supply may also be an important issue in selecting suppliers.

Breaks in production or delivery due to a lack of supplies may reduce the efficiency and volume of production of the business operation.

Also, in supplying products to customers, reliable supply may be an important issue.

Ensuring that products are supplied to customers in the required volumes, and on the specified dates, may be important in successfully operating the business and expanding sales levels.

5.23.3. Price wars and loss-making sales

Price wars

Price wars or may occur when prices are reduced to below the cost of production, resulting in a loss occurring on sales.

This situation may occur when a competitor attempts to increase market share within an industry by selling products at below the cost of production for a period of time.

In the case of a price war, a business may need to reduce prices in order to prevent sales volumes from falling.

This may require the careful management of the business, until the price war has finished and prices return to sustainable levels.

Operating a business during this time may require postponing expenses such as equipment purchases and new development projects, and reducing costs that are not essential to the basic business operation.

Also, focusing marketing and development activities on new products and niche products that are used for specific purposes may be useful in some circumstances, as these products may not be exposed to the same reduction in price levels as general products that may be sold to a broad customer base.

Loss-making price levels

Price levels that are below production costs may also occur in the case of consolidating industries.

In this situation, an industry may be composed of a large number of small enterprises.

Technology improvements may allow economies of scale to be used in the production of goods, or the delivery of services.

In this situation, the cost-per-unit may fall as the volume of production rises.

Businesses within the industry may lower prices in an attempt to increase sales volumes, which may lead to lower costs per unit.

In this situation, businesses that expand volumes may enter a cycle of rising volumes and falling costs, while other businesses may either be purchased, or may loose sales and eventually close or withdraw from the industry.

When a consolidation phase occurs, prices across an entire industry may be reduced to below the cost of production for an extended period of time, as each business may attempt to expand volumes and maintain a sustainable operation.

In the case of operation in a consolidating industry, a number of alternatives may be possible to reduce the possible losses that may occur, and to ensure a sustainable future for the business.

This may include some of the following items.

- Merging with another organisation to increase the size of the business operation.
- Purchasing other businesses to increase the level of sales.
- Raising capital and investing in updated and high-capacity facilities, to enable costs and prices to be reduced in advance of potential sales increases.
- Developing niche and specialty products, or launching a product range within a separate industry, where the products are not exposed to the same price pressure as the main industry products.

5.23.4. Loss-making transactions

Business operation may be a dynamic activity, with circumstances constantly changing and unexpected situations arising.

In some cases, a situation may occur when a loss-making transaction may be necessary to avoid an even greater loss occurring.

For example, a specialised item of equipment may be purchased to manufacture items for a major customer.

However, shortly after the purchase, the customer's business may become insolvent and be liquidated.

Without the income from the customer, serious cash flow problems may arise.

It may be possible to locate a new customer to supply using the equipment, however this may take a considerable period of time.

The business may then be faced with the alternative of doing nothing, which may lead to insolvency and liquidation, or selling the equipment at a large loss in order to raise cash to continue operation until new sales could be generated.

In this situation, a sale of the equipment may be necessary in order to continue operation.

In some cases, a business operator may be reluctant to take this step.

However, initiating a loss-making transaction may be necessary at certain times to allow the business to continue moving forward, and to prevent larger losses from occurring.

In forming a business decision, the relevant issues for consideration may relate to future events, rather than past events.

For example, the relevant issues involved deciding whether to retain or sell an investment may involve the future potential profit or loss from the current value, rather that the profit or loss that may have occurred due to the original purchase price of the asset.

In some cases, initiating a loss-making transaction may allow the business to continue operating, and may be necessary to in order to continue a sustainable business operation and develop the business into the future.

5.24. Redundancy & Backups

A wide range of unexpected situations can occur in business, ranging from a fire in a manufacturing facility, to a major supplier ceasing to supply due to an excepted liquidation of the business.

In order to prevent problems with lost production, failing to meet customer orders and so on, various steps may be taken in advance to reduce the impact that events such as these may have if they occur.

5.24.1. Types of backup

5.24.1.1. Redundant systems

A redundant system may involve maintaining several systems that perform the same function.

In the event of a failure in one system, the remaining systems may allow operation to continue.

In some cases a redundancy arrangement may allow full operation to continue, while in other cases production or service delivery may continue at a reduced level.

Redundancy may be included in manufacturing facilities, by using several small machines in place of a single large machine.

In some situations, an entire production facility may be split into several separate facilities, each of which may operate independently.

Cross-links between different components of facilities may allow one part of a facility to service other sections of the production facility, in the event of an equipment failure.

This approach may also be used through arranging supplies from several suppliers, and in attempting to develop a wide customer base, to reduce the risk that a major loss of sales may occur due to discontinued orders from a major customer.

5.24.1.2. Backup facilities

Backup facilities may involve facilities that are not used as part of the usual production process, and that are specifically intended for use in the event of a failure of a main system.

Backup facilities may include power generation facilities, computer data storage, and items of equipment that may be kept for use in the case of an equipment failure.

5.24.2. Supply agreements

Being reliant on a single supplier for an essential input to the business operation may create a risk for the business.

This may particularly apply in the case of a product that was not widely available in the open market, such as a product that was produced specifically for the business.

In these cases, alternative suppliers may be used to reduce the risk to the business of an individual suppler ceasing to deliver.

The business may source materials from several suppliers on a regular basis.

In this case, a break in delivery by one supplier may be handled by increasing the order size from another supplier.

In cases where volume discounts were a significant issue, the business may source the bulk of the supplies from a single supplier, while sourcing small volumes from alternative suppliers to maintain a regular flow of supplies.

5.24.3. Lines of credit

Lines of credit, such as overdrafts, may be maintained to support the cash flow of the business during an unexpected period of negative cash flow.

These facilities may also provide the funds that may be needed to arrange temporary facilities or replace equipment at short notice.

Stand-by available credit may be a valuable facility for the business to hold.

This may mean the difference between liquidation and continued operation in the event of a major unexpected problem occurring.

Also, it may not be possible to arrange these facilities when the problem has already occurred, and maintaining these facilities on a long term basis may ensure that funds may be available when they may be unexpectedly required.

5.24.4. Documentation

Computer software, operating procedures, and general information needed to operate the business may be documented wherever possible.

In practice, a great deal of time and effort may be involved in documenting procedures and other information, and keeping this information up-to-date.

Large volumes of information may be impractical to review, and in many cases may never be read, except possibly as a reference point for specific issues.

However, a set of simple notes that outlined the key information involved in the business operation may prove invaluable in the case of unexpected events occurring.

5.24.5. Employee backups

Problems may occur when an employee who performs a specific range of tasks within the business operation resigns suddenly.

In some cases, a single individual may maintain a system or process personally, with other individuals in the organisation having little knowledge of the details of the activity.

In cases where an employee resigns suddenly, this may lead to difficulty with continued operation.

These problems may be resolved over a period of time, however temporary disruption to operations may occur.

The risk of this problem arising may be reduced by ensuring that other individuals are broadly familiar with the activities involved.

For example, this could be achieved by having another employee perform the role of a back up for the activity, and perform a small percentage of the transactions to remain familiar with the procedures.

Documenting procedures may also be useful in some cases, however this may not substitute for practical experience in maintaining a system or process, or performing a complex activity within the business operation.

A backup arrangement of this type may be useful then the primary person is absent, such as on annual leave, or if they resign suddenly.

5.24.6. Computer equipment

Backups and redundant systems may be heavily used in computer systems.

Mainframe systems, for example, may have an entire facility duplicated with an identical facility as a back-up to the main operation.

Backups of data storage may be regularly kept of computer data used within business operations, with data copied to tapes or other removable media.

For example, this may involve nightly backups of data storage, with daily copies of data kept for the last 30 days, and with monthly information kept for a previous number of years.

Backup information may be transported off-site to avoid loss of the entire system in the event of a fire.

Commercial buildings may include backup generators to supply power in the event of a commercial power failure, and computer systems may sometimes include similar power backup devices and duplicated equipment.

However, backup equipment and facilities may be expensive, and in general the backup facilities used may need to be assessed in the light of the realistic likely scenarios.

For example, with power lost to an entire building, power backups for individual computers may be of little use in practice.

5.24.7. Excessive redundancy and backups

In some cases, considerable expense may be involved in creating backup facilities.

For example, creating a complete backup facility of a main facility may result in a doubling of the cost of creating the entire facility.

In practical terms, the level and complexity of backup systems that are used may need to be assessed in terms of the chance of the facility being required,

the impact on the business if a failure occurred, the likely frequency of failures, and the practical difficulty in addressing a problem if it actually occurred.

For example, although backup power generation facilities may be provided in some commercial buildings, in practice the commercial power supply may fail on rare occasions and generally for short periods of time.

5.24.8. Keeping backups operational

Backup systems, whether they are operational, financial or computer related, may need to be maintained and used regularly in order to remain operational.

For example, sourcing a small regular volume of goods from a backup supplier may ensure that the details of the business accounts, delivery details, settlement of invoices and other issues were continuing to operate smoothly, and that the supply may be available in the event that the main supplier ceased to deliver supplies.

Backup financial arrangements, such as lines of credit, may need to be regularly checked to ensure that they are still available.

In the case of equipment and computer data backups, these facilities may need to be used on a regular basis to ensure that they remain operational, and that they may be available as they are needed.

5.25. Negotiation

Negotiation between the business and other parties may occur in a wide range of situations.

This may include negotiations with customers and suppliers, involving prices, volumes, and delivery conditions.

Negotiation may also be involved in the process of purchasing or selling a large asset such as a manufacturing facility or a business.

Negotiation situations may arise in many circumstances, ranging from discussions with government authorities involving importing and exporting licenses, to discussions involving the failure of a major joint venture project with another business.

5.25.1. Negotiation situations

Negotiations situations may fall into two categories.

This may include negotiations that are conducted as part of a transaction, such as a negotiation with a major customer.

For example, a business that supplies a commodity on a regular basis, such as a mining operation, may be involved in extended negotiations with a potential customer regarding prices, volumes, payment terms, and other details of a supply agreement.

Also, negotiations may occur in defence to attempts to withdraw value from the business, such as attempts by customers to secure reductions in prices, and negotiations in situations involving threats of legal action being taken against the business.

5.25.2. Negotiation preparation

Effective negotiation may require detailed information.

This may includes a full understanding of some of the following issues:

- A product's strengths and weaknesses
- The complete background to a situation, including an accurate knowledge of the events that actually occurred.
- The business's operational and financial structure, so that the impact of altering volumes and so forth could be considered.
- An understanding of the customer's perspective, and particular issues that may affect a customer or supplier in a particular situation.
- A consideration of the various things that could be offered during a negotiation process, such as break-even pricing levels, the relationship between prices that were quoted and eventual profitability, and alternative items such as pre-payment that

may be beneficial to the customer and could be offered during a negotiation process.

Also, some thought may be given to the general situation, and the nature of the discussions.

This may reduce the chance of agreeing to an arrangement that may later be regretted, and the chance of falling back against sustained pressure from the other party.

5.25.3. Negotiation processes

Negotiation may be most effectively handled through direct and clear offers.

The other party may then respond in various ways, including proposing a counter offer.

This process may continue for some time.

However, an effective negotiation may require that the business focus clearly on its own position, and choose carefully as to when to accept a different proposal, when to suggest a different arrangement, when to stand firm and decline to alter an offer that currently stands, and when to withdraw from negotiations.

Each approach to negotiation may be different, however some general principles may apply.

Withdrawing from a negotiation

A decision to withdraw from a negotiation should be made carefully, and once the decision has been taken , it should not generally be reversed.

Threatening to withdraw, or withdrawing on a whim and then re-entering a negotiation, will destroy the business's ability to maintain a clear position that leads to either acceptance or rejection from the other party.

Fixed offers

One pricing alternative may involve making an early decision regarding a minimum price level, and then offering this price as a fixed offer.

This approach may have the benefit of saving a considerable period of time.

In a serious business negotiation, this position may generally be accepted at face value, and the other party may either accept or reject the offer as it stands.

Fixed pricing may be used in retail and service businesses, and may also be used for asset sales.

Development of contracts

In some cases, negotiation may involve general discussions, followed by a series of revisions to a draft agreement.

For example, the development of complex financing and project arrangements may begin with general discussions involving the basic structure of a transaction.

This may be followed by one party producing a draft set of contract conditions.

The other party may then make a large number of small changes, and return the contract for further consideration.

This process may continue, with the contract passing through a number of revisions, until the current agreement may be accepted as it stands.

Counter offers

In other cases, offers and counter offers may be used to determine the combination of prices, volumes, and other conditions that may be included in a supply agreement.

This situation may particularly apply in the case of large transactions such as purchasing a business, and in cases where the issues that may be important to the other party may not be clear.

This process may allow the business to develop an offer that may be attractive to the customer, while avoiding including features that may be costly to the business, but may be of little benefit to the customer.

This process may continue, with the offers and counter offers converging towards an agreement, until either a party withdraws from the negotiation, or a party accepts an outstanding offer as it stands.

An acceptance may take the form of a direct acceptance, or a proposal to accent the current offer, subject to some minor changes.

Technically, this second approach may be considered to be a counter offer, however this step may indicate that a decision has been made to proceed with the transaction as it stands, and that the changes that may be suggested may be minor.

In some cases, as time passes it may become clear that an agreement will not be reached, and the business may withdraw from the negotiation.

5.25.4. Identified ranges

In some cases, a negotiation may continue for an extended period of time before it becomes clear that an agreement will not be reached.

To reduce the risk that this situation may arise, a set of negotiation ranges may be used

This situation may particularly apply to cases where the negotiation relates primarily to price, rather than to a range of additional issues.

Under this approach, both the buyer and the seller may inform a third party of their negotiation ranges.

The third party may then announce that there is no overlap in ranges, and that agreement is not possible.

Alternatively, an announcement may be made that an overlap in the ranges exists, and a standard negotiation process may begin.

This method was sometimes used in the ancient world.

5.25.5. Negotiation tactics

A wide range of negotiation tactics may be used by opposing parties.

Discussion & criticism

One major approach may involve discussing and criticising the item for sale.

The business should refuse to discuss these issues at all costs.

Aside from answering questions of fact, and responding to offers, no discussion should be entered into regarding the object itself.

In taking this step, the opposing party may attempt to disconnect the businesses from the ability to maintain a clear offer.

In affect, the opposing party may attempt to establish a situation in which the business does not own the item, and is not free to make or reject offers as it sees fit.

In responding to statements and becoming drawn into a discussion involving the item itself, the business may loose the ability to clearly choose its own position, and may become open to manipulation by the other party.

Delay

Delay may be used as a negotiation tactic.

This may particularly apply in the case that the customer has ongoing operations and may not need the item within a short period, while the business may need a transaction to be made within a short time frame in order to meet payments that may soon be due.

Delay is a possible hazard of negotiation.

The business may need to respond to this by accepting the loss that may arise from a delay as a cost of negotiation, and maintain current levels without allowing prices or offers to reduce as time progresses.

The delay itself may be costly.

This may involve costs such as interest, losses where expenses continue however production or service delivery does not occur, and the cost in personal resources of the negotiation process.

This situation may particularly apply when a negotiation is postponed several times before a situation is finally resolved.

Delay may need to be directly considered as a significant issue in the negotiation process.

The business should not generally agree to a delay lightly, and may take substantial steps to ensure that short time periods occur between stages in the process.

A postponement should never be accepted without setting a firm date to continue discussions.

In the case of a postponement with a date to be determined at a future time, the business should either gain agreement for a fixed date, or consider that this step results in the termination of the negotiation process, and should withdraw from the process.

When this is not possible, all practical steps should be taken to ensure that a firm date is agreed, and that the time delay is as short as is practical.

Emotional manipulation

Emotional manipulation may be used in negotiation situations.

This may involve a range of discussions aimed at weakening the ability of the business to form a clear and independent decision regarding its own actions.

These discussions may involve comments regarding the item itself, comments directed at the person conducting the negotiation, comments about general issues, and attempts to create mental ideas and images within the mind of the person conducting the negotiation.

For example, a range of subtle criticisms of the business or the product may be made, within the context of friendly comments that may be intended to open the business to actions that may reduce the ability of the business to maintain a clear position within the negotiation.

The primary defence against these actions may involve declining to engage in general discussions.

The business should restrain itself to simply making offers, responding to offers from the other party, and asking or answering questions to clarify facts regarding the item.

Information concerning the business

Where possible, the business should avoid revealing information about itself, as this may allow the opposing party to take an action that may result in an unfavourable outcome for the business.

Once information has become available, it cannot be withdrawn.

In this situation there may be no action that the business may take to reverse the problem and establish an outcome on more favourable terms.

For example, the business may have cash flow problems, and be in urgent need of a transaction to meet upcoming payments.

Knowing this, the opposing party may lodge a low offer and refuse to alter the offer, knowing that the business may have no alternative but to accept the lower offer.

Without this knowledge, a price that was negotiated may be closer to the natural price level of the product.

As another example, the business may hold an excess stockpile of a particular supply, with a need to clear storage space.

In offering the item for sale, a standard price could be negotiated.

However, if the customer was aware of the problem, they could lodge a firm fixed offer at a low price, knowing that transaction may not fail as would normally be expected, but that the business may be forced to accept the lower terms.

5.25.6. Additional items

Price, quality, volume of supply and reliability of supply may all be major issues in a business negotiation.

However, in some cases a range of other benefits may be offered to a customer or supplier as part of a negotiated agreement.

This may include some of the following items.

- Pre-payments, progress payments, and payments in advance.
- The business assuming certain risks from the customer, such as supplying a commodity at a fixed price even though the market price may be volatile.
- Escrow arrangements and progress payments to reduce the client's risks of default on payments by the business.
- Variable volume arrangements, with the customer being able to vary volume requirements within ranges.
- On-going service and support agreements, such as specified response times to maintenance problems.
- Stand-by arrangements to replace equipment with alternative supplies at short notice, to continue production in the event of equipment failure.
- Payment terms with the customer being able to make payments in instalments over a period of time.
- Including other products and services within a supply agreement, either from the business itself or from other parties.
- Arrangements where the customer or distributor does not need to purchase the goods from the business, and so does not need to source funding, deal with credit risk, or bear the risk of holding unsold items. This may include arrangements such as a sale-or-return arrangement, percentage distribution fees, expenses billed directly to the business and so on.

5.25.7. Base Positions

In a negotiation situation, thought may be given to the base case at which the negotiation could not proceed further, and the business would withdraw from the negotiation.

It may be important to think this process through clearly before the negotiation process begins.

Once the negotiation process begins, all efforts may be necessary to resist pressure from an opposing party.

It may not be possible to make further progress on considering issues, and the business may need to negotiate from the basis that has been built through the initial period of considering the situation.

In some cases, a clear minimum price or other decision may be made in advance.

In other cases, this may not be practical.

However, spending time considering the issues and the situation before the negotiation commences may be useful in clarifying thoughts in preparation for the negotiation activity.

5.25.8. Unexpected events

In cases where an unexpected event occurs, such as a statement from the opposing party that was not contemplated by the business, a short break may be requested to consider the issue.

This may range from a short pause to a postponement for a period of days or even weeks.

Every effort should generally be made to avoid making a statement until time has passed to allow the unexpected statement to be thought through.

Answering immediately or thinking aloud may involve revealing information that the business did not wish to reveal.

Also, when agreement to a new condition has been made or suggested, this may not easily be withdrawn

Although the business may withdraw a condition that was previously offered, in practice this action may be costly in a negotiation situation.

Each term that is agreed may become the new base position for further negotiation, and conceding a term or condition before the issues have been carefully considered may result in a loss of value in a negotiated agreement.

Also, an unexpected event may alter the dynamics of the negotiation situation.

In the case of the businesses responding without having thought through the issues, this action may lead to the other party taking control of the negotiation.

In this case, the ability of the business to maintain a previous position, or to resist pressure from the opposing party may be damaged.

For example, the opposing party may suggest that a large item of equipment be purchased in stages, with each additional stage being optional for the customer.

The business may not have contemplated this possibility.

In responding that this may be possible, without thinking the issue through first, the business may effectively concede this point, and this may become the new base line for negotiation.

This action may have several implications.

The business may effectively become locked into the arrangement, and may have difficultly in withdrawing from this basis and returning the negotiation to a previous point.

Also, having conceded this point, the business may loose the ability to offer this issue as a new benefit in a future offer.

Points that have been conceded may be reversed at future times by simply announcing that a decision has been made to withdraw this particular point from the range of issues offered, however this may be costly.

Negotiations may proceed forward in many directions, however they cannot be reset to an earlier stage.

Conceding points or offering information without carefully considering the implications may permanently reduce the value that a business may be able to defend in a negotiation situation.

5.25.9. Weak bargaining positions

In some negotiation situations, the business may find itself to be in a weaker bargaining position than the opposing party.

This situation may arise in some of the following circumstances.

- When several suppliers are available as alternatives to the business, however only one or two major customers exist within an industry.
- Where only one or a small number of suppliers exist, however the supplier may have many other customers in addition to the business.
- Then a supplier supplies an essential input to the business production or process that cannot be readily sourced from other suppliers.
- When the business may be experiencing cash flow or other problems, which may create time urgency, however the opposing party may not have time urgency.

For example, the business may operate in an industry that may include several alternative suppliers, but only one or two major customers.

In this case, the customer may withdraw from a negotiation at any time with little loss, and may source supplies from an alternative supplier.

In contrast, the business's entire sales may be dependant on a single customer, and the business may be unable to continue operating without sales to the customer.

In the case of weak bargaining positions, one possible negotiation approach may involve the follow steps

- Determining a base position or pricing level that may represent a minimum level for the business operation.
- Offering the base position as a direct fixed offer.
- Declining to agree to reductions below the base pricing level or other base conditions.

In this arrangement, the other party may either accept or reject the proposed offer.

In cases where the pricing level may represent a favourable outcome for the other party, the offer may be accepted following a range of attempts to secure a lower price.

In the case of a rejected offer, this may suggest that the business may be unable to continue a sustainable operation in the current form, and that a change in the business products, operation or activities may be needed.

5.25.10. Alternatives to negotiation

Negotiation may be a long and complex process, and may involve considerable cost and time delays.

Also, depending on the approach taken by the other party, other costs may be borne.

In the case that the other party takes an approach based on applying sustained pressure to the business, this may involve a difficult process.

In some cases an aggressive approach may be taken, while more commonly the opposite approach of a friendly approach may be used, in combination with comments criticising the item or the individual conducting the negotiation, in an attempt to secure a lower price.

A personal cost may be involved in resisting sustained attempts to secure lower prices.

Various approaches may be used as alternatives to a negotiation process.

Fixed prices

Goods may be offered for sale at fixed prices.

Retail goods may be offered for sale at fixed, rather than negotiable, prices.

However, negotiation may be used in the case of some large items.

Independent price levels

Another approach may involve the parties agreeing to use an independent reference point to set the price.

This could involve some of the following approaches:

- A market price of similar goods, based on recent sales.
- A formal valuation, or independent expert's report.

Alternatives to a sale by negotiation may include auctions, inviting submission of tenders, and a bid/offer/counteroffer cycle between two parties without discussions being involved.

Negotiation may be unavoidable in many business situations.

Many negotiations may proceed through a set of simple steps and may be concluded without any particular difficulty.

However, when a large or difficult negotiation occurs, a well thought-out and consistent approach may reduce the chance of an unfavourable outcome for the business

5.26. Business Opportunities

A range of alternatives may be possible for commencing a business operation.

These alternatives may include buying an existing business, starting a traditional business, and forming a business venture based on a new product or service.

5.26.1. Buying a business

Buying a business may involve several advantages as a method of commencing a business operation in comparison to other approaches.

This approach may involve a lower risk than attempting a start-up business activity.

Also, a long time delay in the establishment phase of a start-up business may be avoided.

Businesses of all descriptions may be offered for sale, ranging from part-time craft operations to major sections of multinational corporations.

The cost of a business may be broken up into two parts.

The first part of the cost covers the assets of the business.

In the case of a small enterprise, this may simply be the stock on hand, and possibly some other minor items such as office equipment.

In the case of larger organisations, this could include manufacturing facilities, buildings, and intangible assets such as licenses and patents.

The second part of the cost is known by the accounting term “goodwill”.

This term originally referred to the established operations of the business, which may involve a value that is higher than the value of the direct assets.

In more general terms, this part of the business value may involve the structure and on-going operations of the business.

For example, a cash flow-based service business may have very few assets, but may have considerable cash flow and value due to the regular operations of the enterprise.

In cases where a business has a stable and secure income, a significant cost may be required to purchase the business.

In cases where the business income is volatile or unstable, or the previous business owner performed a large part of the work personally, there may be a low premium to the asset value.

In some cases, such as operations in declining industries or poorly-structured and unsustainable business operations, the sale price of a business may actually be lower than the value of the assets.

Although purchasing an existing business may involve a range of benefits compared to other approaches, the cost of a business may generally be directly related to the stability and the value of the net profit.

5.26.2. Starting a business

Aside from buying an existing business operation, an alternative approach may involve forming a new business venture.

A start-up business enterprise may involve considerable risk.

A large proportion of start-up ventures fail to reach a cash flow positive position, and close when the available funds have been spent.

However, this approach may also avoid the need to pay the additional cost of the goodwill price in purchasing an existing business.

Also, this approach may enable a business to be built from the ground up.

This approach may lead to more secure basis for future expansion than a business purchase in some cases, due consistent development of the business according to a direction chosen by the business owner.

Also, valuable lessons may be learned and experience may be gained during the start-up process.

5.26.2.1. Traditional businesses

A business venture may not need to involve a new idea.

There may be many disadvantages with starting a business venture based on a new idea.

A great deal of experimentation may be required to establish an effective manufacturing process to service arrangement, and this may require considerable cost and time delay.

Also, potential customers may not be familiar with the new product or service, and establishing sales may be a slow and difficult process.

Starting a traditional business may involve forming a new business venture based on an established type of product or service.

Starting a traditional business operation may have a benefit in comparison to starting a business based on a new idea, in that the processes and operations of the business may be well established, and that the necessary supplies may be readily available.

In an industry with a large number of operations there may be organisations that are declining, and existing business operators who may wish to exit the industry for one reason or another.

However, in some industries such as restaurants, a large number of start-up operations may occur on a frequent basis, and establishing a sustainable operation may depend on many issues.

5.26.2.2. New business concepts

Starting a business based on a new product or service may involve a higher risk than other alternative approaches to commencing a business operation.

Long delays may be involved in developing an effective manufacturing process or a practical service operation.

Supplies may not be available for certain raw materials, and equipment that was originally designed for other purposes may have to be adapted to manufacture the new product.

Also, developing a sustainable level of sales may be a slow and difficult process, due to the need to establish the benefits of the new product with potential customers, rather than directly comparing the product against existing products.

However, there may also be benefits with this approach.

In the case of a new product or service, there may be no direct competitors.

The price of an item may be a critical factor in established markets with many competitors.

In the case of a new type of product, the price level may be less critical, and the price may be set according to the benefits of the product and customer interest, rather than existing market prices.

Also, in some cases a new product or service may solve a major problem that occurs with potential customers, and the opposite result may occur, with a large volume of sales being ordered when the product is launched.

Alternatives for new products and services may include some of the following items:

Products for new industries

In the case of new industries, the tools, products and services that are used may be adapted from other industries, and may not be fully suitable for use within the new industry.

Replacements for existing products

In some cases, existing products may be based on imported products that are not suitable for local conditions, or general-purpose products, where creating a specific-purpose product may be a substantial improvement on the existing available products.

In other cases, products that are available within a particular product category may be based on designs that may not have been updated for a significant period of time.

Specialisation in a particular product group

In some situations, products may be manufactured as part of a large group of related products.

In these cases, limited attention may be paid to the design of a particular product or small group of products.

Specialisation in a particular product may allow the business to develop products that are better-designed or are produced with a higher level of quality than the products that are currently available for sale.

Developing a product that applies to a small group of customers

High-volume manufacturing may require that a small number of designs be produced in large volumes.

Due to the small number of designs and the broad range of customers, the product designs may include the basic features that cover the essential requirements across all customers.

However, a small enterprise may develop a product or service for a specific group of customers, containing features that were not available in the large scale general-purpose items.

Applying new approaches and technology to existing products or services

Technology such as computer systems, and even the use basic products such as faxes and mobile telephones may take decades to filter through an industry.

In some cases, there may be opportunities to used well-established technology in industries that do not yet utilise the available methods of producing products or services.

5.26.2.3. Packaged business opportunities

In addition to start-up enterprises and purchasing existing business, business operations may be commenced through a packaged business opportunity.

Packaged business opportunities may involve a business assembling a range of products and services, designed to form the basis for commencing a business activity.

This may involve a single set of items, or in many cases it may involve an on-going business association with the package provider.

A packaged business opportunity may include some of the following initial items.

- Training materials, such as information on producing the products or services, registration and insurance requirements, and so on.
- Lists of potential customers and suppliers.
- Designs for producing products, such as clothing designs.

As part of an on-going activity, the package provider may perform some of the following activities.

- Supplying raw materials.

- Purchasing completed products, for distribution to other businesses or customers.
- Advertising and promotion, in the case of a brand name used for a franchise operation.
- Supplying sales leads and contact information for potential customers.
- Supplying products to be sold by the business to the general public.

5.26.2.3.1. Types of packages businesses

Packaged business opportunities may include franchise operations.

In these cases, the business owner may generally operate under the brand name of the franchise organisation.

Products may be supplied, and the business owner may perform services according to the type of business.

This approach may be used in some restaurants and fast-food establishments, home services such as cleaning and property maintenance, and so on.

In other cases, a business may act as a distributor of the products to the general public.

This may not involve a full-time business operation, as may generally be the case in a franchise operation.

In this situation, the package provider may supply the products, and the business owner may sell the products on an individual basis or to regular customers.

Fees in these cases may be based on a percentage of the sale price, fees for a time period such as a month, or some other arrangement.

Packaged business opportunities may be used in the case of part-time and home-based businesses.

This may include activities such as typing services, small scale manufacturing such as custom clothing orders, and so on.

5.26.2.3.2. Quality of packaged businesses

The structure and quality of packaged business opportunities may vary greatly from one situation to another.

Some packaged businesses may be little more than confidence scams.

In some cases, a large sum of capital may be initially invested, for virtually no on-going benefit.

In some situations, the business operator may find that the business activity may result in an income that may correspond to a very low hourly rate.

In other cases, the package business may represent a worthwhile opportunity.

High quality materials and products may be supplied, and finished products may be purchased by the general public or the package supplier at prices that may allow a strong return to be received from the business activity.

5.26.2.3.3. Risks of packages businesses

Two major risks may be involved in a packaged business opportunity.

In some cases, a considerable payment may need to be made to enter the agreement and commence the business activity.

This may involve the right to use a brand name under a franchise agreement, the purchase price of equipment, or a fee for access to information such as training guides or customer lists.

In the case of an unsuccessful business activity, part or all of the initial cost of entering the business may be lost.

Also, in many cases a contract may need to be signed between the business owner and the package provider.

The contract may specify details of fees and commission rates, including fees that may be paid to the business owner for distribution products, or fees that may be paid to the package provider for the use of the brand name, for advertising expenses and so on.

Although these terms may be standard arrangements in some cases, fixed periods of time and cancellation penalties may also apply.

In these situations, the contract may involve terms such as the requirement to accept delivery of a minimum level of supplies, for a certain length of time.

The contract may also include early termination penalties in the case that a business owner wishes to exit the arrangement before a particular period of time has passed.

The inclusion of minimum terms, minimum volumes, and exit penalties, may represent a potential risk to a business owner considering a packaged business opportunity.

In the case that the business operation is unsuccessful, or the business owner may be faced with the alternatives of withdrawing from the business operation and incurring a large loss, or continuing in a long term arrangement that may generate very little income, and may not be an activity that they may wish to continue.

5.26.2.3.4. Assessing a packaged business opportunity

In some cases, a packaged business opportunity may be accompanied by claims of earning high levels of income with the input of very little time or effort.

In general, this situation itself may present a warning sign as to the effectiveness of the business operation.

However, while claims of potential income, sales figures, profits and so forth may be considered in assessed a business opportunity, a safer approach may involve placing little weight on any information regarding the possible level of returns.

5.26.2.3.4.1. Direct calculations

Where possible, information regarding the cost of raw materials, the cost of equipment, and the sale price of products should be determined before a decision is made to proceed with a packaged business opportunity.

This information may be determined from a sample contract or supply information, or may be requested from the package supplier.

Complex calculations may not be necessary in these situations.

In many cases, a simple rule-of-thumb calculation may be sufficient to estimate the potential income and returns from a business.

For example, the following figures may be determined.

Input figures

Raw material cost per product	5
Sale price per product	7
Cost of equipment	800

Estimates

Products produced per hour	5

From these figures, the some of the following estimates may be made

Profit per item = sale price – cost

= 7 – 5

= $2

Profit per hour = profit x number of items

= 2 x 5

= 10

Time required repay the equipment cost (without income)

= total cost / profit per hour

= 800 / 10

= 80 hours

A range of basic estimates and calculations such as these may establish the possible returns from a business operation.

In some cases, this approach may not be practical.

For example, the business owner may be reliant on the package supplier supplying work orders and customer requests, in order to generate production volume.

In some situations, a profit amount per item may be adequate, however long time delays may occur between orders, and the actual volume of items that may be produced and sold over a period of time may be low.

Existing business operators

In some cases, a business owner may be able to speak to other clients of the package provider, to determine the overall effectiveness of the business process.

If a package provider refuses to supply details of other clients for potential contact, this may be a negative sign as to the effectiveness of the business operation.

Information sourced in this way may not always be accurate.

In some cases, another business operator may have a poor view of a business operation, when in fact the business may present significant opportunities.

In other cases, a business operator may speak highly of the business operation, for one reason or another, when in fact the business operation may have serious deficiencies.

However, a few short telephone calls may be useful in gaining an impression of the response of existing business owners to the packaged service.

Trial & error

In cases where the initial cost investment is not large, and early termination penalties may not apply, the business activity may be attempted on a trial and error basis.

In this situation, the business activity may be commenced, and the business owner may later withdraw from the operation if the activity is unsuccessful.

This process may also result in a considerable amount of experience being gained, which may enable the business owner to determine the questions that may need to be asked and the issues that may be involved in selecting a business opportunity, and may be a useful experience in selecting a new business activity.

5.27. Liquidity

Liquidity relates to the time delay that may be involved in selling an asset.

Liquidity may be a significant issue in business operations.

For example, a business may have considerable assets in equipment, buildings and facilities.

However, if an unexpected major expense arrives, the business may become insolvent if the available cash holdings are not large enough to make the required payment.

As an example, a major development project may be in progress.

A progress payment may be expected from a client.

However, unexpectedly the client may become insolvent and default on the payment.

Expenses may arise continuously as time progresses, however cash reserves may not be available to meet the payments.

Liquidity may also a major issue in some industries such as investment management.

In general, selling a major asset such as a property or business may involve a minimum of several months between the time that the decision is made to sell the asset, and the time that the funds from the sale are available for use.

In the case of very large projects and businesses, this time delay may extend to several years.

Several steps may be taken in structuring a business to reduce the chance of problems arising due to liquidity issues.

5.27.1. Increasing the liquidity of assets

Various steps may be taken to reduce the time delay that may be involved in selling assets.

These include some of the following points.

Tradeable securities

Tradable securities include shares, listed bonds, and units in property investment trusts.

Liquidating small parcels of tradable securities may be possible within a few days, although in the case of large amounts, a longer time delay may be involved.

However, unless the parcel represented a large section of a company, tradable securities may generally be liquidated within a period of a few weeks.

Holding capital investments in this way, as opposed to alternatives such as direct ownership of property or long-term bank deposits, may allow funds to be raised at short notice from selling the assets.

Multiple Assets

Selling large assets may involve a longer time delay than selling small assets.

Holding business assets in the form of several small assets, rather than a single large asset, may reduce the time delay involved in selling an asset.

This approach may also have a benefit in enabling the business to sell only part of the asset base, in contrast to a single large asset, which may involve selling all or none of the assets.

For example, a business may operate from several buildings, or maintain several items of equipment, rather than operating a single large facility.

A disadvantage of this approach may be that a large facility may have more efficient operation and lower costs than several small facilities.

5.27.2. Avoiding fixed assets

Liquidity problems may be reduced by leasing equipment and property rather that owning assets.

This may allow the capital of the business can be stored in more liquid forms, such as tradable securities and cash balances.

Also, altering expense levels by re-locating to larger or smaller premises may be done in a short period of time and for low cost in some situations, where buildings are leased rather than owned.

5.27.3. Raising funds

In some cases, funds may be raised without selling the asset itself.

Secured lines of credit

A secured line of credit may involve an overdraft facility that is secured against an asset such as a property or an item of equipment.

This may involve a loan that is available for the business to draw funds from as required.

During normal operations, the loan may not be used.

However, if liquidity problems arose, funds could be withdrawn from the facility to meet cash flow needs.

This may be a valuable facility for a business to maintain.

A secured line of credit may allow the business to raise funds on short notice, without the time delay and cost involved in selling an asset, and without loosing the asset itself.

Also, the funds may only be drawn when they are needed, and there are may be no interest costs unless funds are drawn from the loan.

A facility such as this may need to be arranged in advance, as this may not be possible after a problem has already occurred.

Raising debt

In cases where the cash flow of the business remains strong, however cash reserves are insufficient to meet large payments that may be due, debt may sometimes be raised against an asset using a secured loan.

This approach may avoid liquidity problems that may result in time delays and costs in selling an asset, and may avoid the business loosing the use of the asset itself.

Hiring out assets

In some cases, cash flow may be generated by hiring an asset out to external parties, rather than selling it.

This may involve performing contract manufacturing for other parties, leasing properties for short-term uses such as seasonal business activities, and hiring out surplus equipment on a short-term basis.

5.27.4. Business equity

Liquidity may be a major issue for business owners wishing to withdraw from a business enterprise, and recover their funds.

There are three fundamental ways that this can be done.

Winding up the business

Winding up a business may involve ceasing operations, selling the assets, and repaying outstanding debts.

This may be done in cases where the business owner wishes to cease business operations.

This approach to exiting a business activity may be particularly applicable to cases involving operations in a declining industry, operations where the

business owner personally performed a significant amount of the work, and project-based operations when a project has been completed.

Selling the equity stake

A second alternative may involve the business continuing in its previous form, with the business owner selling their share of the business to another party.

In the case of a listed company, this process may be relatively straightforward.

However, a time delay may be involved if a large proportion of the company is being sold, as this may not be possible through trading directly through the market in a short period of time, due to a lack of sufficient buying volume.

The shares may be sold gradually over a period of time, or they could be placed in large blocks to institutional investors or other parties, usually at a discount to the current price.

In the case of private operations, selling an equity stake may be more difficult.

Businesses may be advertised for sale through various publications, and business brokers may carry lists of businesses for sale.

However, long time delays may be involved, and in some cases a buyer may not be found for a business, or part of a business.

In the case of a partnership, this approach may involve a partner withdrawing, and another party paying for the partnership interest to join the partnership.

Buying back the interest

In cases where the business equity represents only part of the operation, in some cases the operation may buy back the share of the business using cash funds.

This effectively involves withdrawing the business owner's share of the business as cash, with the remaining parts of the business continuing to operate as before.

This option may only be available in cases when the share of the business does not represent a major part of the business assets.

For example, a partner may withdraw from a partnership by taking their share of the partnership value in the form of cash.

In the case of a company, this may be done through the company purchasing the shares from the shareholder, and then cancelling the shares.

When a larger proportion of the business is involved, the same process could be followed, with the shares being bought back over a period of time using the cash flow from operations.

5.28. Sensitivity analysis

Sensitivity analysis involves determining the effect that a change in one value may have on another value.

This issue may be relevant in many areas of business.

For example, in a business with a high debt level, the cash flow and net profit may be highly sensitive to interest rates.

A rise in interest rates may result in a large reduction in cash flow and profit, while a fall in interest rates may have the opposite effect.

Leverage

As a general rule, high sensitively may occur when leverage exists.

Leverage may apply when two large numbers are separated by a small margin.

In the case of financial leverage, a large debt and a large asset value may be separated by a small net asset value.

In the case of operational leverage, income and expenses may both be high, with a slim margin of difference representing net profit.

In the case of production leverage, a high proportion of costs may be fixed costs.

In this situation, a rise or fall in sales may result in a large rise or fall in cash flow and net profit.

As an example of leverage, a business may have income of $100 and expenses of $98, for a net profit of $2.

If income was to fall by 1% to $99, then net profit would fall by 50% to $1.

This is an example of high sensitivity.

5.28.1. The significance of sensitivity

The values that a business operation may be sensitive to, by definition, may be the values that may present risk to the business.

In most cases a variation may occur in either direction, and an adverse move in a sensitive input may have a major impact on the business.

Sensitivity analysis may be an important part of modelling large projects, and managing businesses with volatile inputs or outputs.

5.28.2. Calculating sensitivity

Sensitivity can be calculated in a number of ways.

5.28.2.1. Direct calculation

In some cases, the output result may be calculated as a direct multiple of the input result.

For example, the following sensitivities can be calculated directly.

Type	Value Affected	Formula	Description
Operational sensitivity (operational	Gross cash flow	$\frac{\text{income}}{\text{income - expenses}}$	The multiple of change in cash flow to change in either income or expenses

leverage)			
Asset sensitivity (financial leverage)	Equity (Net assets)	$\frac{\text{assets}}{\text{assets - debts}}$	The multiple of the change in equity to the change in asset values
Interest rate sensitivity	Net cash flow	$\frac{\text{interest expense}}{\text{net profit}}$	The multiple of change in net profit, to change in interest expense. A change in interest rates from 5% to 6% would lead to 20% rise in the interest expense
Input price sensitivity	Gross cash flow	$\frac{\text{cost price per unit}}{\text{total cost per unit}}$	The multiple of the change in total cost per unit, to the change in the price of a raw material
Production Sensitivity (production leverage)	Net Profit	$\frac{\text{units x (unit sale price – unit variable cost)}}{\text{units x (sale price – unit variable cost) – fixed costs}}$	The multiple of percentage change in net profit to the percentage change in production volumes.
Time Sensitivity	Net Profit	$\frac{\text{expenses}}{\text{income - expenses}}$	The multiple of the percentage change in net profit, compared to a percentage change in time periods, where income is fixed and expenses are time-dependant.

Table 3

(** check percentage changes vs. dollar changes)

For example, in a case where a business had assets of $50 and debts of $40, the asset price sensitivity would be

$$\text{asset sensitivity multiple} = \frac{\text{assets}}{\text{assets} - \text{debt}}$$

$$= \frac{50}{50 - 40}$$

$$= 5$$

In dollar terms, a change in asset values would have the same dollar affect on the net assets.

However, in percentage terms, a multiple may apply.

The percentage change that occurs in one value as a result of a change in another value may be calculated using the following formula.

$$\text{output change} = \text{sensitivity multiple} \times \text{input change}$$

For example, using the previous figures, the assets may rise from $50 to $55.

The percentage change in the input figure may be calculated using the following formula

$$\text{change} = \frac{\text{new value} - \text{old value}}{\text{old value}} \times 100$$

In this example, this calculation may produce the following figure

$$\text{change} = \frac{55 - 50}{50} \times 100$$

$$= 10\ \%$$

The affect on the output figure may be calculated using the sensitivity approach.

For example, the percentage change in net assets could be calculated using the following example.

$$\text{change} = 5 \times 10\ \%$$

$$= 50\ \%$$

The actual change in dollar terms may be calculated using the following formula.

$$\text{actual change} = \text{original amount} \times \frac{\text{percentage change}}{100}$$

In this example, this would be

$$\text{actual change} = 10 \times \frac{50}{100}$$

$$= \$5$$

5.28.2.1.1. Time sensitivities

Sensitivities may also be applied to periods of time.

In the case of project analysis using a net-present-value approach, a set of future income and expense cash flows may be discounted to present values to determine a net present value of a project.

This method is a fundamental approach to determining the value of any set of cash flows.

In some situations, project expenses may operate as a fixed amount per time period.

This may involve staff costs, rent, equipment hire or depreciation, and interest costs.

In contrast, the income from the project may be a fixed dollar amount.

In situations such as these, a change in the time period required to complete the project may lead to a change in the net profit from the project.

In situations involving a fixed value of income and involving time-based expenses, the sensitivity of the net profit to changes in time periods may be calculated using the following formula.

$$\text{time sencitivity} = \frac{\text{expenses}}{\text{income} - \text{expenses}}$$

For example, a project may involve the following figures.

Expenses	100
Income	120

The time sensitivity could be calculated using the following example.

$$\text{time sensitivity} = \frac{100}{120 - 100}$$

$$= 5$$

In this case, a percentage change in the time required to complete the project may lead to five times the percentage change in the net profit from the project.

The change in net profit may be calculated using the following formula.

$$\text{net profit percentage change} = \text{time sensitivity} \times \text{time percentage change}$$

For example, the time required for the project completion may be 10% above the scheduled time period.

In this case, the reduction in the net profit from the project may be calculated using the following example.

$$\text{net profit percentage change} = \text{time sensitivity} \times \text{time percentage change}$$

$$= 5 \times 10\%$$

$$= 50\ \%$$

This may be illustrated using the following figures.

	Scheduled	Actual
Expenses	100	110
Income	120	120
Net Profit	20	10

In this case, the expenses have increased by 10% due to the time delay, while the net profit has reduced by 50%.

The risks of losses occurring due to time delays may be reduced in some circumstances by quoting a rate based on a margin above the costs that are required to actually complete the project.

However, a client may not wish to accept the risk of increased costs being incurred through time delays.

In this situation, a client may offer only a fixed-price payment for the project, or may only accept the project development if the development contract includes a range of penalties for late completion of the project stages.

5.28.2.2. Correlation

In some cases, the sensitivity an output result to an input value cannot be calculated directly using a formula.

For example, in the earlier example of advertising and sales, the advertising expense may have affected the sales figures.

However, this link may be based on probabilities, rather than a direct dollar change, as may apply in the case of a change in raw materials costs.

In some cases, a regression can be used to determine the sensitivity of an output figure to an input figure.

The regression process may produced an equation in the following form

$$\text{output value} = a \times \text{input value} + b$$

In this formula, the value "a" could be used to estimate the likely dollar change in an output value for a dollar change in the input value.

This may be represented by the following formula

$$\text{dollar change in output} = a \times \text{dollar change in input}$$

The sensitivity multiple may be calculated using the following formula.

$$\text{sensitivity multiple} = a \times \frac{\text{input value}}{\text{output value}}$$

For example, in the previous case of the advertising figures, the value of "a" was 0.84.

This implies that a one-dollar change in the advertising expense may lead to a 0.84 dollar change in sales

In a case where the current advertising level was $15 and sales were $100, the multiple could be calculated using the following example.

$$\text{sensitivity multiple} = 0.84 \times \frac{15}{100}$$

$$= 0.126$$

In this example, a change in advertising expense at this level of sales may lead to 0.126 times the percentage change in sales.

For example, if the advertising expense was increased by 20%, then the percentage change in sales may be calculated from the following example.

$$\text{output change} = \text{sensitivity multiple} \times \text{input change}$$

$$= 0.126 \times 20$$

$$= 2.52\ \%$$

5.28.3. Modelling

In the case of complex products and organisational structures, computer models may be created to determine the output figures based on the input costs.

For example, in a mining project, a model may include the costs of equipment, staff costs, supply costs and so on.

The output may then be based on the volume of production, the percentage of the mineral that occurred within the bulk ore, input costs and so forth.

Sensitivity analysis of models of this type may be performed by altering the input figures, and determining the percentage change that results in the output figures.

In some cases there may be direct a multiple affect, while in more complex situations such as chemical production or financial instruments, the output affect may rise or fall depending on the condition of other variables.

A “Monte Carlo” simulation may involve generating a large number of random values, and determining the resulting output values for a set of random inputs.

For example, in the mining case, random values may be generated for the percentage of the mineral within the ore, fuel costs, and production volumes.

This may then produce a statistical distribution of the output of the project, with the likely worse-case, average, and best case results from the project.

The Monte Carlo simulation approach may be used in projects with many volatile inputs, such as mining projects, and in the valuation of some complex financial markets instruments and portfolios.

5.28.4. Managing sensitivities

Once the sensitivities have been determined, an approach for managing the business may be determined.

In the case of inputs that do not cause high sensitivity, these can be managed as standard costs.

All costs may impact on the business, and even small costs may need to be managed effectively.

In some situations, the total cost may simply be a collection of many small costs, which may accumulate to a large total cost.

In these situations, managing each cost effectively, including small costs, may be necessary in order to prevent the total costs from becoming excessively high.

However, in the case of inputs causing particular sensitivity, these values may need specific action.

Approaches for managing risk exposures to sensitive inputs may include some of the following possible approaches.

- Using hedging techniques such as futures contracts, offsetting risks, and sourcing supplies in the same currency as sales to reduce the exposure to values such as currency exchange rates and commodity prices.
- Negotiating medium-term fixed-price contracts with suppliers or customers.

- Altering pricing arrangements to pass a volatile input price through to the final price of the product.

- Using options to allow prices to be fixed in advance, without the need to enter a contract before the future stages of the project are known.

- Quoting prices as a margin on costs, rather than a fixed price contract. This arrangement may be used, for example, in areas such as construction, where a client may request a quoted price for a project such as constructing a building.

- Limiting exposure to particular values by including clauses in client agreements that specify that a price move above a certain limit may be passed through to the client.

- Arranging with other parties to take on certain risks in return for fees.

- Taking action to reduce sensitivities, such as reducing debt levels or increasing margins, to reduce the risk that changes in values may have a major negative impact on the business.

5.28.5. Variable sensitivities

In some cases, a sensitivity may not be constant, but may vary as the underlying figures increase or decrease.

(** check conditions for fixed/variable sensitivities)

In these cases, a sensitivity may be used to estimate the affect of a small change in an input value.

However, a large change in an input value may lead to a different result than may be expected from a sensitivity calculation.

For this reason, sensitivities may not accurately reflect the risk exposure of the business to large changes in input values.

In these situations, re-calculating the output values for different sets of input values, rather than using sensitivity multiples, may be used to determine the effect on output values of large changes in input values.

5.29. Business expansion

In some situations, a business operation may remain stable for an extended period of time.

This may occur in cases in which the business owners may be personally involved in the operational activities of the business, and in situations such as successful single-product companies.

In other cases, a business may expand continuously over time, developing new products, and commencing operations within new markets.

Businesses may also contract in size and operations over time.

This may occur in the case of declining industries, highly competitive industries, and in cases where the business owner may loose interest in operating and developing the business.

5.29.1. Operational problems

In cases where a business is experiencing operational problems, these problems may need to be addressed before any expansion options are considered.

However, expansion may be considered in the case of a successful operation, while in some circumstances, expansion activities may solve an existing problem within the business operation.

For example, a business may have overcapacity and may operate high-capacity production facilities that are not fully utilised.

In this case, expanding sales may lead to improving returns, from increasing the utilisation of the facilities.

5.29.2. Expansion

Business expansion may be a worthwhile activity in a number of circumstances.

This may include some of the following situations.

Strong cash flow

In the case of a successful business operation, a number of approaches may be taken.

Cash flow may be directed towards increased dividend payments.

However, re-investment in new products, projects and facilities may also be necessary to ensure that the business operation continues to remain profitable.

Some products may develop a stable long-term sales pattern.

However, in general the markets for products may change continually, and a business that does not continually change may find that sales enter a long-term decline after a period of time.

In situations were cash flow is strong, expanding the business activity may also be considered.

High fixed costs

In the case of a business with high fixed costs, such as expensive high-capacity production facilities, increasing volumes may lead to increased profitability, as the fixed costs may be able to be spread across a larger number of units.

Unused capacity

In cases where a business has production or service delivery capacity that is currently unused, engaging in expansion activities may enable the full capacity of the facilities to be used, and improve the profitability of the business.

Declining, consolidating and highly competitive industries

In some cases, an existing business operation may be unable to develop a steady net profit due to the conditions within the region or the industry in which it operates.

Population may be declining within a local area, an industry may be consolidating into high efficiency production facilities with low costs and low prices, or competition may be particularly intense within the industry, with competitors offering break-even or loss-making prices.

In situations such as these, an existing business operation may be unsustainable in its current form.

A business in a situation such as this may engage in expansion activity, in an attempt to establish a different business activity that may operate on a sustainable basis.

5.29.3. Organic growth Vs acquisition

Business expansion may broadly follow two paths; organic growth, and growth by acquisition.

Organic growth may involve the gradual expansion of an existing business operation.

Acquisition may involve expanding the business by purchasing other businesses.

Organic growth

Organic growth may involve growing the business by expanding the business enterprise.

This process may involve developing new products and services, and expanding sales volumes through marketing activities, and though being able to offer competitive prices due to efficient operations.

Within industries in which economies of scale may apply, organic growth may lead to a cycle of rising volumes, reducing costs per unit, investment in higher capacity production facilities and continued rises in sales levels.

This process may result in some industries consolidating into a small number of large organisations.

In other cases, organic growth may occur through expanding sales into wider areas, launching new products, and entering new industries or markets.

Acquisition

Growth by acquisition may involve purchasing other businesses.

This may involve the payment of a goodwill cost, which may not be necessary in the case of organic growth.

However, acquisition may enable a business to make large leaps in size in a short period of time, and may be a useful approach for commencing activities in new markets or industries.

This may particularly apply in the case of entering industries in which economies of scale may apply.

In these situations, commencing a small operation and gradually expanding may not be a viable option, as the small operation may not be able to operate with equivalent costs and prices to the large existing operations.

This situation may be addressed through purchasing an existing business that is established within the industry.

Acquisition may be useful in acquiring new technology, which may be combined with existing operations to increase the efficiency of the expanded business enterprise.

Some industries may involve a stable number of business operations.

Although the industry may operate on a profitable basis, the level of profits may be sufficient to maintain existing operations, but not high enough to fund expansion activities.

In these cases, expansion through organic growth may be difficult.

This situation may be addressed through raising capital to purchase other businesses, and to expand customer numbers and sales by using an acquisition approach.

This method may particularly apply within industries in which economies of scale do not apply, such as some service industries that may involve a large number of small individual businesses with separate client bases.

5.29.4. Vertical & horizontal integration

Horizontal growth may involve expanding sales and customer numbers within the level of the industry in which the business operates.

A business may be involved some of the following activities.

1. Primary production such as mining or farming.
2. Supply of raw materials.
3. Production of basic supplies.
4. Production of complex products.
5. Wholesale distribution to other businesses.
6. Retail distribution to the general public.

This sequence of steps, from extraction of basic supplies through to delivery of finished products, may be known as the supply chain of an industry.

Vertical integration may involve a business operating activities at a number of levels within the supply chain.

For example, a food manufacturer may conduct farming operations, produce food products, and distribute products to the general public.

One argument that may be used in favour of this approach may involve the fact that a profit margin may not need to be paid to suppliers in other stages of the supply chain, when the business conducts the activities directly.

However, this may be a flawed argument.

Each stage in the operation may require investment in capital equipment and projects, on-going expenses, and management of the business activity.

In effect, by operating at several levels in the chain, a business may simply operate several independent business operations.

There may not be an automatic benefit in this approach.

In cases where the return on the investment was the same at each level in the chain, the same result could be achieved by allocating the entire business resources to operations within a single level of the supply chain.

However, there may be a number of potential advantages and disadvantages with a vertical integration approach.

This may include some of the following points.

Advantages

- Greater control over quality and reliability of supplies.
- Possible increased profit margins when one stage in the process, such as a step in the distribution process, collects fees but does not add significant benefit to the production process.

Disadvantages

- Potentially more complex operations, with the need to manage several different businesses, where each business may involve different issues from the other businesses.
- An inability to increase or decrease supply volumes from early stages in the chain, when sales levels rise or fall. This may lead to a shortage of supplies during times of high sales, and high costs due to unused capacity during times of slow sales.

5.29.5. Expansion activities

A number of activities may be involved in expanding the business operations.

This may include some of the following points.

Advertising and promotion	Conducting advertising and promotion campaigns may lead to increased sales. Regular on-going advertising may enable the business to build a brand name profile, and may lead to a steady expansion of the business activity.

Entering new markets	New markets may involve creating new product lines within an industry, such as the establishment of large-scale production of basic items, by a business that may have begun with the production of low volume, high margin specialty and customised items. New markets may also involve new geographic areas and new industries.
New products	New products may be created to replace old product lines, and to begin production of products that the business has not previously sold.
New industries	In cases where a business may have a large market share within an industry, where organic expansion may be difficult, or when competition may be intense and profit levels may be low, the business may expand activities into new industries. This may involve purchasing another business, creating a start-up operation, or gradually commencing operations in a new industry.
Geographic expansion	Sales of the business's products and services may be extended to interstate and overseas markets. This may involve exporting products, performing services for overseas clients, or establishing operations in other states or countries.

5.30. Cash flow maps

The structure and operations of a business may be represented in a wide variety of diagrams and graphical formats.

The following format presents one alternative for illustrating the cash flows between major components of a business operation.

Although this diagram involves a picture of cash flows, the value transfer due to the depreciation expense is also included where it is significant.

This diagram may correspond to an organisational structure, or it may simply be a method of analysing the major components of the business financial structure.

In this diagram, the elements have the following descriptions

Ovals	Internal components of the business. Each oval corresponds to a major independent function of the business operation. The ovals have the following format. Height – the value of the assets within the component. Width – the number of employees related to the component. Line thickness – the value of cash flowing through the component. In this case, the cash flow refers to the income and expenses of operating the area, not the volume of payments that may be processed or goods that may be transported.
Boxes	External parties to the business. This includes employees, suppliers and customers, to describe cash flows due to salaries, supply costs and so forth.
Diamonds	The value of assets, reflecting the drain of the depreciation expense.
Lines	Cash flows or value transfers between components. The thickness of the line represents the size of the cash flows.

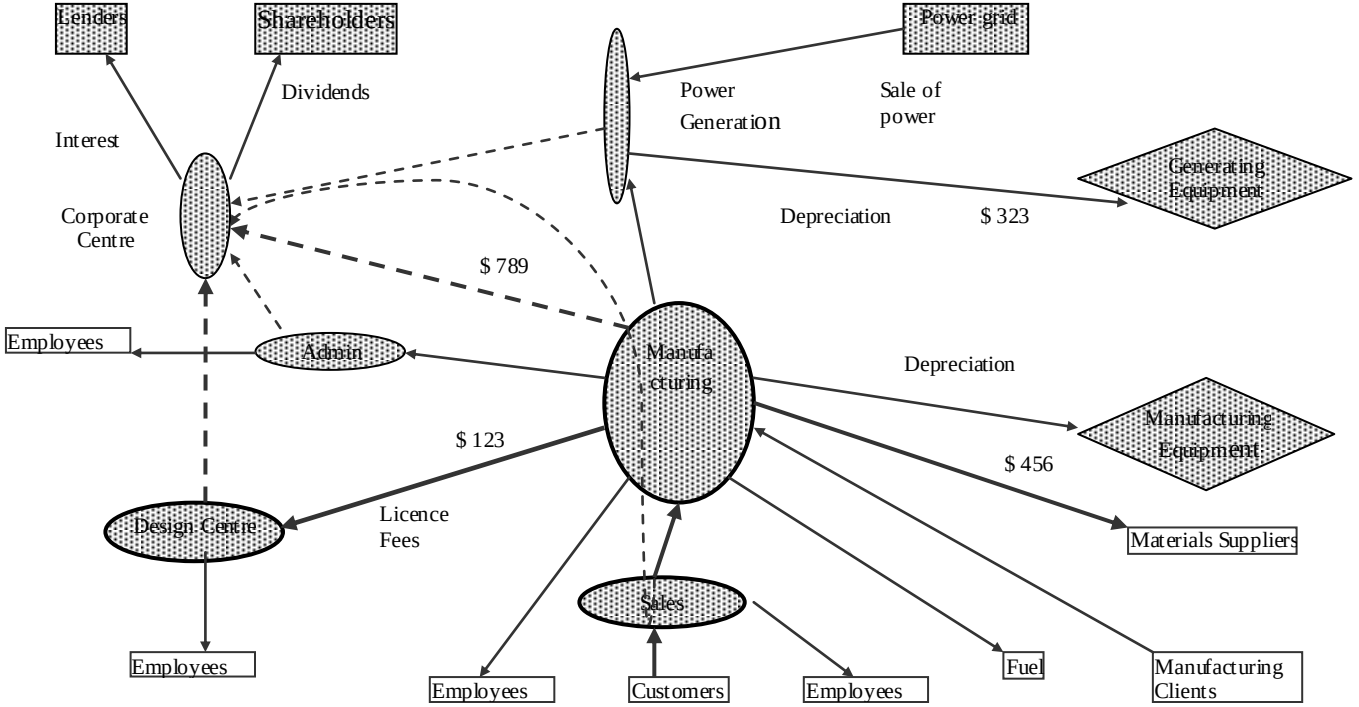
Various sizes and thicknesses may not be to scale, however they may be in proportion to the relative sizes of each component.

Only major cash flows are included, and staff costs or depreciation are not included for components where they may represent a minor element of the cash flows or value transfers.

The business in this example is a manufacturing operation, and has the following components

Corporate centre	The funding centre for raising capital and

	distributing interest, dividends and holding equity funds.
Administration & general services	Processing of customer payments, registers of assets and so on
Manufacturing	Production of products. This section sells goods on a wholesale basis to the sales and distribution area, and also receives income from preforming contract manufacturing for external parties.
Sales & distribution	This area sells products to customers, with wholesale prices being paid to the manufacturing operation.
Design centre	A design centre that produces physical designs for products, and receives licence fees from the manufacturing operation.
Power generation	A separate power generation facility generates power for the manufacturing operation, and also receives income from delivering power into the regional supply grid during times of peak prices and demand.


Lenders
Shareholders
Power grid
Dividends
Power Generation
Sale of power
Interest
Corporate Centre
Generating Equipment
Depreciation
$ 323
$ 789
Employees
Admin
Manufacturing
Depreciation
Manufacturing Equipment
$ 123
$ 456
Licence Fees
Design Centre
Materials Suppliers
Sales
Employees
Employees
Customers
Employees
Fuel
Manufacturing Clients

5.31. Practical aspects of commencing business

5.31.1. Concept

Commencing a business activity may involve beginning with a broad concept in mind of the type of business that may be operated, and the size and scope of the business operation.

This may involve ideas ranging from part-time craft activities, to commencing a business operation with an aim of long term development and expansion of a business enterprise.

Initial ideas may also involve the option of purchasing an existing business, or commencing a start-up operation.

Purchasing a business may be a worthwhile option when the aim of the business activity is to operate a stable long-term activity.

Businesses such as a conference centre with accommodation and meals facilities may be operated on this basis.

In the case of long term expansion, a start-up business activity may be suitable, due to the lessons that may be learned and the skills that may be developed in building a business from a zero starting point.

5.31.2. Research

A considerable amount of research may be involved in the process of preparing to commence a business activity.

This may involve locating information about the particular industry of the activity, major issues that may be involved in operating a business of that particular type, and so on.

This may also involve information concerning business activity in general, such as managing financial arrangements, legal issues and so on.

An investigation of the types of businesses that may be offered for sale, and the various prices, may also be necessary in order to select an appropriate business to purchase, or in order to estimate the costs and potential income of a start-up operation.

5.31.3. Funding

Funding may be a major issue in commencing a business activity.

This may involve arranging bank loans as a personal borrower, and locating other parties to invest in the enterprise, either through lending funds, or as part-owners of the business as equity investors.

A borrowing arrangement may have a benefit of allowing ownership and control to remain with the initial business owners.

However, this may also require regular interest payments, which would not be necessary in the case of an equity investment.

Also, investors may not be willing to loan money due to the risks involved and the limited return from interest, and may prefer an equity arrangement that may involve a pro-rata share of the business profits.

5.31.4. Business structure

In commencing a business activity, a business structure may need to be selected.

Major alternatives may include some of the following options.

Company	Assets are owned in the name of the company, and the business owners hold shares in the company.
Individual	Assets are owned personally in the name of the business owner.
Partnership	Assets are owned in joint names, in the names of the partners. (** check asset title registration for partnerships)

A company may be suitable for business enterprises involving more than two or three business owners, or in the case of a significant sized business operation.

However, the practical steps involved in transferring capital into and out of a company, and a number of procedural requirements such annual returns and annual meetings, may lead to a company structure being cumbersome for an individual enterprise.

5.31.5. Buying a business

In the case of buying a business, information may be sourced from business brokers and publications regarding businesses for sale.

An extended period of time may be necessary in order to become familiar with the types of businesses available, and the options that may be open for the business owner to commence a business operation.

5.31.6. Professional services

Business operations may deal with various parties in the course of business activities.

Discussions and transactions may involve customers, clients, suppliers and employees.

In the case of professional services, the following areas may be involved.

Accounting	An accountant may prepare tax returns, prepare financial statements, and possibly advise on funding and other financial issues.
Legal	A solicitor may draw up contracts, employment agreements, leases, mortgages and so on. A solicitor may also advise on the legal options that may be available in various circumstances, advise on steps that may be taken to reduce legal risks, and prepare cases involving legal action against other parties, or defences to legal action.
Banking	A business may deal with a contact at a bank regarding loans, overdraft facilities, and so on.

5.31.7. Insurance

In some cases, insurance of various types may be legally required before a business may commence operation.

In other cases, arranging various types of insurance may be prudent step before commencing operations.

Insurance in these circumstances may involve insurance involving injury of employees, regarding medical expenses and lost income.

Other insurance may include buildings and contents, public liability insurance against legal action, and so on.

5.31.8. Registration & licenses

A number of registration and licensing steps may be required, depending on the type of business.

Forming a company may involve completing a registration form, and payment of an initial fee and an annual fee.

A business may need to be registered with tax authorities, depending on the particular situation.

Licences to operate may also be required in some industries, and may involve applications to a local council, or applications to state or national regulatory authorities.

5.32. Miscellaneous business risks

5.32.1. Valuations

5.32.1.1. Write-down risk

Write-downs

Valuation is an area of risk management that can have a significant impact on a business operation.

In some cases, a major write-down in the value of an asset can lead to the collapse of a business.

When a major write-down in the value of a significant asset occurs, the structure of the balance sheet and the gearing ratios may deteriorate significantly.

In this situation, rolling over debt or raising funds to continue operation may become difficult or impossible.

Asset values

This risk particularly applies to the valuation of non-physical assets.

This includes the valuation placed on projects, valuations based on future income streams, valuation of brand names and intangible assets, and the value placed on financial trading books.

These assets may have a subjective and highly variable value, with a change in valuer's opinions, valuation assumptions or valuation models leading to a large change in the valuation of the asset.

5.32.1.2. Reducing write-down risk

Where assets carry a significant value in the balance sheet, various steps may be taken to reduce the risk of a major write-down occurring.

This may include some of the following approaches.

Rule-of-thumb verification

Where possible, a rule-of-thumb approach may be used to verify that a valuation is within a realistic range.

A considerable amount of time and effort may be involved in preparing a detailed valuation.

However, in many cases a comparison with other assets, or a simple calculation, may be used to ensure that the valuation figure is within a broadly reasonable range.

For example, a detailed valuation of a business may be conducted based on the business's margins, assets, the markets for the business's products and so on.

A separate order-of-magnitude check of the valuation could involve a calculation such as a multiple of the current net profit.

As an example, a multiple of eight times net profit could be used to calculate an approximate value for the business being valued.

In some cases, such as the valuation of complex instruments and trading portfolios, broad checks of the valuation may not be practical.

In these situations the auditing and review of valuation approaches may become particularly important.

Auditing models

In cases where a valuation is derived from a model, an independent audit of the assumptions, structure and operation of the model may be conducted.

Valuation models are used to value future income streams, uncertain values such as project cash flows, and trading instruments in situations such as hedging portfolios.

A valuation audit could be performed by an external party, or by a separate business area from the area that developed or operates the model.

An auditing process may discover problems ranging from typing mistakes in formulas, to fundamental errors in calculations involving concepts such as value transfer, capitalised expenses and so on.

In some cases, specific errors in valuation models, or alternative viewpoints of a financial structure, may lead to large differences in valuation figures.

Valuation opinions

In some situations, the value of an asset may be highly uncertain.

For example, a project may involve launching a new product within a new market, with a valuation being required for the purposes of a sale or for preparing a balance sheet.

In situations where the value is highly uncertain, major differences in asset values may arise when an asset is re-valued, or when an asset value is assessed by other parties such as lenders.

The risk of the business suffering a negative impact in these situations may be reduced by ensuring that the financial and operational structure is not dependant on an asset value that is highly uncertain.

Conservative valuations

Valuing assets at conservative levels may reduce the risk of a major asset write-down.

In these cases, the assets are held on the balance sheet at a low point within the realistic value range.

Valuing assets at realistic levels may be necessary in order to raise debt and to accurately reflect the strength of a balance sheet.

However, an excessive valuation may lead to the business commencing a transaction that cannot be supported by the current structure, and that fails mid-way though, leading to a large loss.

Commencing a project development that is too large to be funded by the business may be an example of this situation.

In a case of financial distress, funds raised from selling assets that were conservatively valued may not be significantly below expected levels, and in this case the chance of insolvency may lower than in a similar situation in which optimistic valuations had been used.

5.32.2. Fraud & Mismanagement

5.32.2.1. Fraud

Fraud and mismanagement are potential risks within any organisation of significant size.

In some cases, this may involve an employee attempting to embezzle money from the business.

This could involve situations such as an employee withdrawing money from the business accounts, or goods being purchased from a business associated with an employee at above-market rates.

While situations such as these may occur at times, and internal audits may be necessary to address these risks, direct fraud may be the lesser of two potential problems.

The appearance of false positions within a business operation may have a potentially devastating affect on the business.

5.32.2.2. Mismanagement

In the case of medium sized and large organisations, the business owners may not directly manage the operations of the business.

Mismanagement occurs when an individual or a management team manages the operations of a business, however the management activities are not effective in operating and developing the business.

5.32.2.2.1. Supervision

Supervision of the management activities may be performed by the board of directors in the case of a company, or by the business owners in the case of other business structures.

Supervision may be based on reviewing the financial results and other reports of the business, and reviewing the audit reports.

5.32.2.2.2. False position situations

Although ineffective management activities are one potential risk within a business operation, a more serious situation can arise in which a false appearance of the business is presented.

This may involve an entire organisation being fabricated, complete with assets, an organisational structure, and financial reports extending over several years.

In some cases, the public appearance of a company that was presented to the board of directors through internal briefings, and to investors through public statements, has been revealed to be completely false.

This may result in a business that appeared to be in a strong financial position, being revealed to be insolvent, with few assets and large debts.

5.32.2.2.2.1. The development of a false position situation

Situations such as this often begin with a single individual who successfully developed the strategy and operation of the organisation.

Over time, the individual may take direct control of large sections of the organisation activity, and personally direct operations and activities.

In some situations, usual controls and constraints may be relaxed in order to allow the individual to continue developing and expanding the organisation's activities.

For example, the separation between internal areas may dissolve, with the individual taking direct control over several independent areas.

Limits on the size of approvals for projects, asset purchases and trading operations may be extended, or effectively removed completely.

This situation may continue for a period of time, with expansion progressing successfully.

However, in some cases, a period of problems may develop.

False statements may be made in an attempt to prevent the problems coming to light, in the expectation that the problems may be a short-term situation.

However, as time passes, the public presentation of the situation and the actual reality may diverge more and more, until eventually there are two completely independent structures.

One structure is the structure that appears in reports and presentations, while the other structure is the actual reality.

This situation may end when the internal operations collapse, and the internal structure is revealed to be completely different to the public presentation.

5.32.2.2.2.2. Avoiding false position situations

A number of steps may be taken to reduce the risk of situations such as this occurring.

Constraints

Although constraints may be altered in line with the expansion in size of an activity, limits and constraints should generally remain in line with the size of the operation.

For example, one common arrangement is that an individual employee, or the management team, is granted authority to allocate funds for a project or an asset purchase up to a certain maximum limit.

Costs above the authority limit must be presented to the business owners or the board of directors for approval.

In the case of a successfully expanding operation, procedures may be streamlined and authority limits may be altered, however this should not extend to the point where an effective review of decisions no longer occurs.

Reporting

Situations involving false positions may involve reporting that is very late, is lacking in detail, and contains missing information.

A situation such as this may raise issues concerning the effective management of the business, regardless of issues of possible false positions.

Internal reporting should generally be prepared on a regular basis, it should contain detailed and up-to-date information, and it should be released as soon as is practical after the end of the relevant period.

When this does not occur, this situation should generally be investigated, and action may be taken as required to ensure that accurate reporting is carried out.

Chinese walls

A "Chinese wall" involves a separation between parts of an organisation, with each part operating independently.

Chinese walls may be used in situations such as stock broking operations.

In this example, a corporate advisory area may advise companies on activities that are in progress, while a trading area may trade based on publicly released information.

Communication in these cases is strictly banned.

In situations such as this, insider trading regulations prohibit trading operations from using non-public information in making trading decisions.

Although the term "Chinese wall" is not generally used in relation to auditing, this concept also has significant implications for the prevention of false position situations.

A false position is generally only possible when an individual controls several separate areas, such as a trading or asset purchasing area, a settlements and administration area, and an accounts preparation area.

Implementing a Chinese-wall style of separation between each major area of an operation may significantly reduce the chance of a false position situation arising.

Where possible, the use of separate buildings to house the various operations may be a significant practical step in this process.

Although the usual business communication may be involved, a clear separation between the areas should be maintained.

For example, an individual within one area should not generally have the ability to employ staff, allocate projects, select computer systems and perform other direct controls of the processes within a separate area.

In effect, communication between areas in these circumstances may involve a similar situation to communication with an external client.

Although this process may not be necessary in all areas of a business operation, a separation of this nature may be particularly important in the case of market trading operations and settlement areas, and between internal audit areas and other areas of the business.

Auditing

Effective audits may prevent false position situations from developing in many circumstances.

In cases were false position situations develop to serious levels, audit reports may be very late or not received at all, brief altered summaries of audit reports may be presented, or serious issues may be raised in audit reports, but not addressed.

Audit reports should be received directly by the board of directors or the business owners, not by the management team.

Where serious issues are raised, such as insufficient records being kept to verify whether the figures were accurate or not, these issues should generally be addressed effectively.

Auditing of trading operations and settlement areas may be particularly important, as major problems can arise in the case of incorrect or inaccurate trading records.

Internal audits

An internal audit area may be an important part of any large organisation.

An area of this type may audit individual areas on an occasional basis, reviewing records, reported figures, and procedures for recording and reporting information.

An internal audit area should generally be considered to be independent of the rest of the business operation, and report directly to the board or the business owners.

Intervention

In some cases, an individual may develop a high profile within an organisation, and other parts of the organisation may have difficulty in conducting audits, or reviewing decisions, due to the profile held by the individual.

However, the assets of the business remain the property of the business owners or shareholders, and the debts of the business are also the responsibility of the business.

In the case of some large organisations, a management team may determine the direction of the business, with the board of directors performing a supervisory role, to ensure that major problems are not developing, and to take actions that directly affect the shareholders, such as responding to takeover offers.

In cases where reporting is not adequate, where audit reports raise serious issues, and so on, the board may intervene in the operations of the organisation if it is necessary to ensure that the problems are resolved.

The separation of control that can sometimes occur in these cases should not generally extend to a member of a management team having authority to prevent an internal audit area from performing audit activities, or to prevent enquiries being made by board members to determine the internal operations of the business.

5.32.2.2.2.3. External reviews

Problems may also arise in cases where a false position is presented by the business owners or the board of directors themselves.

This situation may occur in the case of private business structures, although it is not common in large organisations or listed companies.

Creditors and shareholders holding substantial positions in a business may request that independent audits be conducted, or in the case of smaller enterprises, may check records and operations personally.

5.33. Miscellaneous business issues

5.33.1. Free items

When the label “free” is associated with items for sale, this may sometimes be associated with strong interest from customers.

However, as a customer, a business should be aware of the fact that a “free” item may have various components in the business environment.

For example, two businesses may have advertised a package of products in the following way.

	Business A	Business B
Product A	100	80
Product B	free	20
Total Cost	100	100

In this situation, business A has included a “free” product with their sale of product A, while business B has not.

However, the total cost of purchasing the two products is same, whether they are purchased from business A or business B.

In fact, had the pricing been different, the cost of purchasing the package from the business that included the free gift could actually have been higher than the cost of purchasing the package from the business than did not include the free item

As a buyer, the relevant issue is the total value of items that are received, compared with the total cost paid.

Labels of “free” are irrelevant in these situations.

Although the term is technically correct, a more accurate phrase may be “included within the standard price” or “at no additional charge”.

Free items may represent a genuine discount to the standard price in two circumstances.

A common promotion technique is to purchase a set of items, and include these items for no additional charge with the standard product, for a limited period of time.

This may provide a temporary boost in sales, clear inventory, and raise the profile of the product.

In this case, a genuine discount has been included for the limited period, as the standard price of the product has been maintained.

Free items may also involve issues such as interest-free finance, where the item is available for the same price with or without the interest-free financing.

In this case, the business is effectively offering to sell the item for two different prices, with the interest-free approaching involving a lower total cost to the buyer than a direct sale.

However, any items that are included for free on a permanent basis should generally be considered a part of the standard product package, and compared directly with alternatives available from other businesses.

5.34. Economic and industry structure

The following section describes some structures and issues relating to economies and industries, as applicable at the time of writing.

Economies and industries may change substantially over time.

However this section may highlight some of the structures that appear from time to time, and some of the issues that may apply.

(** check details of individual economies and figures)

5.34.1. The structure of some economies.

5.34.1.1. The United States

The United States holds the largest individual economy in the world, generating approximately XX% of world economic production. (**check economic percentage).

The US stock market comprises roughly half the capitalisation of global stock markets.

The US economy is broadly based, with a mix of primary production such as farming, manufacturing, and service industries.

Defence equipment production is a significant industry in the US, and also in Britain (**check).

The pharmaceuticals industry is also a significant industry within the US, and includes a number of large business operations.

These industries may have a small presence within many smaller economies.

5.34.1.2. Britain

The British economy is also a broadly based economy.

Many British organisations operate in various regions of the world, reflecting the colonial history of British activity.

The British economy involves a high level of manufacturing activity, and Britain imports raw materials and exports manufactured items.

British firms have a significant involvement in heavy engineering such as ship building and commercial construction.

A large number of construction engineering projects, such as commercial office building developments during the construction boom in Asia during the 1980's (**check decade) have been designed by British engineers.

5.34.1.3. Europe

Europe comprises a significant proportion of global economic activity.

The German economy is particularly significant.

The German economy includes a significant manufacturing sector.

Industries within German are generally heavily regulated.

Inflation is considered a major issue, reflecting the extreme inflation rates in Germany in the 1920's (** check period).

The Bundesbank (** check spelling) central bank in Germany manages interest rates with a major view to the risk of inflation developing.

France is also a major economy within the European region.

Industry within Eastern Europe and regions of the former Soviet Union is poorly developed, with many regions being largely agricultural farming areas, with little industrial production facilities.

5.34.1.4. Japan

The Japanese economy represents a major part of world economic production (** eheck figures).

The Japanese economy is heavily orientated towards manufacturing.

This includes vehicles, heavy engineering, consumer electrical goods, and commercial building construction.

Japan has very few natural resources, and the Japanese economy imports a large number of materials, while exporting manufactured goods.

The Japanese economy expanded continuously over the fifty year period following the second world war to the late 1980's.

Over the 1990's, the Japanese stock market declined steadily to loose a substantial part of its value from the peak in the late 1980's.

The Japanese economic system has a structure that is superficially Western in operation.

This includes a large stock market, traditional Western corporate structures, and a banking system that is similar to the systems operating in many Western economies.

However, Japanese business practices may be significantly different from practices in other economies.

For example, many Japanese businesses are grouped into broad associations known as (** check spelling), which trade with each other in preference to trading with customers in the broad economy.

Credit issues may be considered secondary to on-going business associations in some circumstances.

5.34.1.5. China

China is a huge region both geographically and in terms of population, with over one billion people living as part of the Chinese republic.

China operates under a communist system of government.

Under the communist system, resources are allocated by the state, rather than being owned by individuals and traded between individuals.

China is largely a rural economy, with many areas having little in the way of industrial manufacturing facilities.

However, there are several cities within China with sell developed economies and significant commercial activity in a similar way to that which may occur in Western cities.

Business has a strong tradition within China, and business activity extends back several thousand years.

China and Asian regions in general may have a traditional outlook towards luck and good fortune, in contrast to the scientific rationalist view of the world that may be prevalent within Western societies.

5.34.1.6. Canada

Canada has a similar population to Australia and the Canadian economy has a number of similarities to the Australian economy.

Mining is a significant section of the Canadian economy.

South Africa also has a significant mining sector.

The modern populations of Canada, South Africa and Australian all expanding rapidly with Gold was discovered in large quantities.

5.34.1.7. The Middle East

Oil is the major export of the Middle Eastern region.

This region supplies a large proportion of the world's supply of oil.

In turn, oil is a major input to the developed economies.

Oil is used in the production of fuel, including diesel fuel, petrol, and aviation fuel.

Oil is also the raw material that used for the manufacture of plastic.

Manufacturing in the Middle Eastern region is largely conducted by small-scale operations.

Large industrial plants are less common in the Middle East than in the economies of the West.

However, significant technology may be developed and used within some of these operations, although large-scale industrial production such as motor vehicles is not common within this region.

5.34.1.8. Australia

Economy

The Australian economy is a broadly based economy, with a mix of manufacturing, primary production and services.

Mining is a feature of the Australian economy and forms a significant proportion of activity.

Mining is a small feature of most economies, with several individual countries such as Canada also having significant mining operations.

Services are a significant part of the Australian economy.

Financial services, including banking and insurance organisations, comprise over a quarter of the stock market capitalisation (** check figures).

Australia conducts significant primary production activities.

This includes exporting large quantities of wool, wheat, coal, iron ore and other bulk commodities, in addition to manufactured products, services and technology.

Listed property trusts are a feature of the Australian stock market.

These vehicles form around 5% (** check percentages) of the market, which is significantly higher than the proportion in most other developed markets.

Listed property trusts are investment vehicles that pool investment capital and purchase large commercial buildings and industrial complexes.

Properties of this type are generally owned directly by various organisations in most other Western economies, such as retirement funds and asset management funds.

Political system

The political system in Australia is based on democratically elected governments.

Parliament passes laws, raises taxes, and allocates funds.

Almost half the economy is based on organisations and activities funded from government revenues.

This proportion is similar to the proportion of the public system within other developed economies (** check details)

Legal system

The legal system is based on a continuation of the legal system developed through the last few hundred years from English court judgements.

The legal system is independent of the political system.

Legal judgements are based on laws passed by Parliament, and from the long history of legal judgements that have produced the principles of contract law and other legal concepts.

Economic system

The Australian economic system is a capitalist system, which recognises the concept of individual property rights.

Individuals may own property, and may buy and sell items.

However, a significant proportion of assets and structures are also owned through the public sector, which operates under a similar concept to the communist system, where resources are allocated by a central authority, rather than being traded between parties.

Capital markets

Australia has a strong banking system and a well developed stock market.

Due to the large volume of agricultural production, the futures market in Australia is well developed and the Sydney Futures Exchange conducts a significant proportion of futures trading activity within the Asia-Pacific region.

Fundraising through public equity raisings is similar in operation to funding activity in other developed economies, although the venture capital market in Australia are not as well developed as in some of the larger economies.

5.34.2. Industry structure

Unless otherwise indicated, references to the structure of industries refer to the Australian economy.

However, many industries have a similar structure and operation in the other developed economies of the Western world.

5.34.2.1. Primary production

The primary production sector of the economy is a relatively small part of the economy in percentage terms, as is the case in most developed economies.

However, primary production activities form a major part of exporting activity, and form a larger part of the Australian economy that is the case in economies that have few natural resources, such as Japan.

Primary production is mainly organised as sole enterprises and family operations.

5.34.2.2. Mining

Mining is a capital intensive industry, requiring large items of equipment to perform mining operations.

Mining exploration is also capital intensive, with large sums of capital being required to locate and develop new mines.

The output products of mining are commodities that generally trade in global markets, with prices being volatile and being determined by supply and demand within the market.

An exception to this may be bulk commodities, such as coal and iron ore, which may be sold through long-term customer agreements.

Operation of a mining activity may involve scheduling production and planning the extraction of the ore body.

Complex models may be developed of the estimated structure of the underground ore, based on geological formations.

A successful mine operation may involve locating an ore body with a high enough grade of the commodity compared to the surrounding ore, to enable the commodity to be extracted at a cost that is low enough to result in a profitable sale at market prices.

Market prices vary widely over time, and some mines are closed for periods of time during sustained low prices, and reopened when prices rise.

Mining operations once comprised 80% (** checking timing and figures) of the stock market, although with technology improvements and lower costs this has declined over a long period to be around 15% at the time of writing.

5.34.2.2.1. Bulk mining

Australian mining operations form a significant part of the economy, with Australia supplying a large proportion of the world's supply of a range of different commodities (**check details)

Bulk mining includes coal, iron ore, and bauxite for producing aluminium.

Bulk mining is performed by several large mining companies.

Most of the production is exported to various regions, with Japanese steel mills being a major customer of iron ore (**check).

Oil and gas is also produced by several large organisations.

Oil and gas production is a highly capital intensive industry, with large sums of capital being required to establish oil drilling platforms.

5.34.2.2.2. Precious metals

Precious metals such as gold, silver and platinum are produced from mines within Australia and around the world.

Mineral sands are also mined to extract rare minerals from mineral sands.

Large mining companies may operate a number of mines, while a range of small operations may conduct exploration activities or operate a small number of mines.

Start-up operations may be common within the mining industry, particularly during times of high prices for particular mining commodities.

A sum of capital may be raised from investors, exploration may be conducted, an ore body may be located and mining may commence.

These operations may be formed by a number of associated people, rather than as a sole enterprise.

The cash burn rate of these operations may be high, and an exploration company may raise additional capital every few years, or in some cases more frequently.

5.34.2.3. Banking

Banking in Australia is highly concentrated, with the four major banks forming the bulk of banking operations, with a range of smaller banks also operating.

This is in contrast to many other countries.

In the US, for example, until recently laws prohibited banks from operating across multiple states, and the banking industry in the America is highly fragmented.

Banking may involve two quite separate businesses.

Transaction banking

Transaction banking may involve the day-to-day operations of deposits, cheque clearing, and account transfers.

Transaction banking is a service business.

Banks may operate with a large loss in transaction banking, which is subsidised by the other part of the banking operations, involving loans and deposits.

Banking is a labour-intensive industry, with large numbers of staff being employed in branches and administration areas.

Banking is gradually changing from a labour-intensive industry to a technology-intensive industry.

Payments through ATM's, EFTPOS and internet transfers now make up a significant proportion of banking transactions, with less than 20% of transactions now being personally conducted in a branch. (** check details)

Technology may also be involved in processes such as automated cheque scanning, mailing of letters and statements, and so forth.

Asset banking

Asset banking involves loans and major deposits.

Asset banking is a balance-sheet business.

The bank's capital supports a large spread of lenders and borrowers.

The difference in interest charged on loans, and interest paid on deposits, forms the return on the shareholder's funds.

The major activity involved in this process may involve the credit processing of loan applications, and administrative processing of deposits.

Credit management

Credit management may be a major issue in banking, with the aim of credit assessment being to accept a large proportion of loan applications, while also rejecting loan applications than may be likely to result in defaults on payments and losses.

Credit management during most periods of recent history has been largely successful, with the amounts of capital lost to bad debts in many banks being small in relation to the volume of loans on issue.

A major risk in banking may involve the possibility of a large increase in loan defaults, either through poor lending and credit management, or through a major recession leading to a large number of insolvencies and liquidations.

Banks maintain shareholder's capital that is equal to around 8% of the total loans on issue (**check).

This capital provides the buffer to support the defaults on loans that may occur during the banking process.

During the late 1980's for example, banks were involve in a rapid expansion and large loans were made for development activities.

During the major recession of the early 1990's, some major banks came close to insolvency.

5.34.2.4. Insurance

5.34.2.4.1. General Insurance

General insurance is a now a commodity business.

A commodity is a product that is sold in large volumes, and is produced by a range of different business.

Examples of commodities may include agricultural commodities, mining commodities, standardised computer hardware, and general insurance.

In these cases, similar products may be offered by multiple businesses, and price may be a major factor in a purchase decision.

Within commodity industries, economies of scale and efficient production or service delivery may be major factors in determining the success of a business operation.

General insurance was once a labour-intensive industry, with large amounts of manual administration and processing of paper documents.

During the 1980's (**check period), computer processing of insurance administration was implemented to a greater extent than previous usage.

A cycle of industry rationalisation began, with large operations becoming larger, spreading fixed costs across a larger number of transactions, and resulting in a lower cost per transaction.

Rates were reduced to below the cost of production to build customer volumes and to develop sustainable operations with larger volumes and lower costs.

Following several years of below-cost pricing, and a number of mergers, company failures and withdrawals from the industry, several large operators emerged.

General insurance may involve two operations; administration and underwriting.

The underwriting operation assesses the insurance risk and sets the premium rate, and the claims area processes claims against the insurance policies.

General insurance is effectively an administration business, selling commodity products in high volumes.

Due to the fact that there are few barriers to entry and that many organisations consider establishing insurance operations, margins a slim and profitability is not high within this industry.

5.34.2.4.2. Life insurance

Life insurance companies in Australia, and also in other parts of the world, particularly in Britain and Europe (**check), may trace their history back over more than a century.

In some cases, life insurance operations began as co-operative societies, with pooled funds being used as a combination of a savings plan and risk-based insurance.

These funds continually expanded over time, and there are now some very large life insurance organisations in operation.

Mutual funds

A "mutual" insurance organisation is one in which the customers are also effectively the shareholders of the operation.

This is the nature of a co-operative society.

This structure was once common for savings and insurance organisations.

Although this arrangement may appear to be more attractive to a customer than a commercial operation, where a proportion of product prices may be retained as net profit and distributed to shareholders, in practice the opposite situation may often occur.

More efficient operations and structures within commercial enterprises, in comparison to mutual societies, may resulted in lower prices being charged by commercial enterprises than mutual funds, despite the profit-making nature of the enterprise.

Also, an individual may be both a customer and a shareholder of a commercial enterprise.

In this case, however, the relationships are clearly separated, and an individual may chose to be a customer, a shareholder, both, or neither.

Most large mutual life insurance societies converted to commercial enterprises during the late twentieth century.

Bundled & unbundled products

In the past, insurance products were often bundled products, and may have included a saving plan, risk-based life insurance, investment, and other features such as temporary withdrawal through a loan.

These products were generally complex to administer and had high internal fess embedded within the structure.

Withdraw penalties were also high, with penalties for early withdrawal applying for up to 10 or 15 years after the commencement of the policy.

These products gradually lost favour to new products that were developed during the 1980's.

A more common approach may now involve risk-based insurance policies, and separate investment funds for asset holdings.

Distribution

Life insurance was originally sold door-to-door on a commission basis.

However, life insurance may now be more commonly offered through distribution channels such as banks and financial advisory services, and directly from the customer to the life insurance company itself.

Activities

Life insurance may involve two major activities; underwriting of risk-based insurance, and investment management.

Risk-based insurance may be offered as a stand-alone product, or may be a component of a bundled product or a pooled savings scheme.

Risk-based life insurance may follow the same basic structure as other forms of insurance.

A buffer of capital may be kept to meet claims.

Risks may be assessed, premiums may be paid, and claims may be paid as they occur.

Investment management may involve investing funds in shares, property, and fixed interest securities such as government bonds.

Investment management may be used within life insurance companies to invest the reserves that are held for meeting claims, to manage investments in funds that are selected by customers, and to manage funds held within pooled savings schemes or bundled insurance products.

Life insurance, as with general insurance, may have a large administration component.

However, life insurance is still a labour-intensive business, and it is possible that this industry may follow a similar path to the general insurance industry, and become heavily computerised with high volume administration services being used.

Large mainframe computer systems are heavily used in insurance.

The banking and insurance industries were among the first major uses of computers.

However, these software systems may be extremely complex, due to the complex nature of the products.

At present, these operations may not be suitable for the simplicity and efficiency of the high volume administration services that may operate in other industries such as payments processing.

Valuation

Valuation of life insurance companies is a specialised activity.

Life insurance has its own profession, being the actuarial profession, which performs statistical and financial calculations involving insurance probabilities and long-term cash flows.

Life insurance companies are valued using an "embedded value", which is effectively a net-present-value calculation of the future income stream for the product accounts that are currently operating. (** check)

Solvency

Solvency may be a major issue with both life insurance and banking operations.

Sufficient capital may be needed to meet possible losses due to large claims or loan defaults, while excess capital may reduce shareholder returns.

Insurance companies and banks may attempt to raise additional capital during periods of poor solvency.

However, if the organisation waits until serious problems have already occurred and there is a serious risk that the organisation may become insolvent, in some cases additional capital may not be able to be raised, due to the high risk that investors may loose the money that is invested during the capital raising.

Life insurance is regulated on a supervisory basis by a government authority.

Banking is also regulated in this way, however in the case of banking there are also specific capital requirements for banking operations.

5.34.2.5. Healthcare

The health industry is a significant section of the Australian economy, as it is in most economies of the Western world.

Health and education are two major areas of government expenditure, with other major areas being defence and a wide range of other programs and expenses.

The health system involves public hospitals, private hospitals, health funds, the government health insurance scheme, doctors and specialists in private practice, and a wide range of other areas such as pathology laboratories.

Healthcare is a highly regulated industry.

Issues such as fee rates, access to various facilities, procedures and approval for various activities are controlled in many cases through government regulations.

Medical practices may be conducted as sole enterprises or partnerships in many cases.

Traditional business operations may involve private hospitals, and some other facilities such as radiology operations and pathology laboratories.

In the case of heath care, many input and output costs may be fixed, and the arrangements for funding with health funds and the government health system may be complex.

5.34.2.6. Asset vehicles

Asset vehicles include trusts and companies whose major role is simply to contain a physical asset.

This includes property trusts, which own large commercial and industrial properties, and infrastructure vehicles, which own assets such as toll roads and airports.

From the perspective of an investor, these assets may be similar to a fixed-interest bond, with a highly stable future cash flow.

Asset vehicles may also have a steady capital growth.

These vehicles may trade with stable prices and low volatility, with the price largely being determined on a yield basis, with the income yield being comparable to bank deposits and government bonds.

Infrastructure trusts

Infrastructure trusts may be established on a single-fee basis, or with an on-going fee to the party who created the asset vehicle.

Creating the asset vehicle may involve some of the following activities.

- Arranging a fund raising.
- Purchasing the assets.
- Establishing an investment administration operation, to handle issues such as maintenance, income collection, and distributions to unit holders or share holders.

Structures of this type may be created by an investment bank.

Property trusts

In the case of asset vehicles such as property trusts, two separate issues may be involved.

This may include the management of the property itself, which may involve locating and communicating with tenants, arranging leases, arranging maintenance and so on.

Also, managing a property trust may involve the investment management of the assets.

This may involve selecting an appropriate mix of properties within the portfolio, buying and selling properties, and arranging refurbishments, with a view to improving the capital growth of the portfolio.

Creating and managing an asset vehicle is a service business.

The property trust sector is a significant sector in the Australian stock market, with about 5% of the market being made up of property trusts.

This is a much larger proportion than in many other countries, in which the list property trust sector may be quite small.

5.34.2.7. Biotechnology

Biotechnology involves the development of medical technology for purposes such as diagnostic tools to identify the presence of diseases.

The Biotechnology sector in Australia comprises a range of small organisations.

This sector may operate in a similar way to mining exploration, and the establishment of software companies during the Internet boom, with small companies raising capital to develop new products, and often operating with negative cash flow and high burn rates.

5.34.2.8. Pharmaceuticals

The pharmaceutical industry involves the development and production of medical drugs and other pharmaceutical products.

The pharmaceutical industry does not have a significant presence in Australia, although this may be a significant industry world-wide.

The development of new drugs may be an extremely expensive process.

Drug development may require large sums of capital.

Thousands of potential compounds may be investigated through a long series of trials and tests, and the development of a single successful drug may take over a decade.

The income from drug production may become a long-term income stream to the company, with the cost of production being low in comparison to the development costs.

The development of new drugs is fundamentally a project-based activity, with a period of high capital expenses during the development phase, and a long-term income stream from sales in the event of an effective compound being developed.

5.34.2.9. Telecommunications

The telecommunications sector is a significant section of the economy, both in Australia and overseas.

This includes telephone services, mobile telephone communication, and data services.

Telecommunications may involve complex technology, however telecommunications this is largely a capital-intensive industry, rather than a technology-intensive industry.

The telecommunications industry is dominated by several large organisations.

Telecommunications is a growth industry, particularly in terms of data services.

Large capital investments may be required to install and maintain equipment and facilities such as telephone lines, exchanges, cable services and mobile communication facilities.

However, variable operating costs may be low.

Facilities may be largely automated, and there may be few raw materials or other costs associated with the actual use of telephone services.

The income from services may be used to offset the fixed costs of installing and maintaining equipment.

This industry also includes a number of small organisations that do not construct or own facilities, but purchase operating time in bulk from the major operators, and then provide services directly to customers.

These operations may be distribution and service businesses.

5.34.2.10. Retail

Retailing forms a significant proportion of economic activity.

Retail operations may vary widely from small operations conducted as sole enterprises, to large chains of stores and large organisations operating a range of different retail activities.

Retailing may involve issues of inventory and stock management, selection of products to carry, advertising, and the location of facilities.

Sales patterns

Some retailing operations are seasonal, with sales occurring at certain times of the year.

This may be calendar dependant, such as December retail sales, or weather-dependant, such as summer or winter retailing activities.

Other retail operations may be cyclical, such as the retailing of consumer durable products such as whitegoods.

These operations may experience sales levels that may rise and fall with the general level of economic activity.

In cases involving consumer staple goods such as food retailing, sales may not vary greatly depending on economic conditions or seasonal effects.

Margins

Barriers to entry in the retailing industry are low, and retailing is a highly competitive industry.

Many retail operations operate with low margins and limited profitability.

Supermarket chains are operated by several large organisations, due to the economies of scale that may be possible through centralised buying and spreading fixed costs such as advertising across a large number of transactions.

Supermarkets may operate with margins of only a few percent of sales.

Fashion boutiques and specialty stores may be at the other end of the spectrum, with high margins on individual items, and a low volumes of sales.

Franchise & company chains

Some chains of stores operate on a franchise basis, where each store is owned by an independent business operator, who pays a licence fee for the use of the store name and for costs such as advertising.

Other chains may be operated as traditional business operations, with staff being employed by the company and the facilities being carried on the balance sheet as assets.

Operating a chain of similar stores may allow the business to spread fixed costs, such as central administration and advertising, across a large number of transactions.

Also, this may allow larger amounts to be spent on advertising than may be possible in the case of an individual operation.

However, this approach may only be applicable to certain types of operations, and many retail operations that service a small region may be operated as sole enterprises.

5.34.2.11. Utilities

Utilities include the supply of gas and electricity.

These industries were owned and operated as state enterprises in Australia until recently.

During the 1990's, a move to a privately owned competitive system began.

There are now separate organisations involved in building and operating power stations and gas distribution pipelines, wholesaling of services from operators to retail organisations, and retail organisations that buy services in bulk and distribute services to the general public.

This process is only partially completed.

For example, the initial stage involved a specific retail organisation for each area, and following an establishment phase to develop on-going operations, the next announced step has been to allow customers to choose between different suppliers.

Utilities are regulated industries, with the prices that can be charged being set by a government regulatory authority.

In this context, operating the business may involve the control and management of costs, gaining efficiencies through economies of scale, and supplying additional services to customers on a fee-for-service basis that are separate from the regulated assets.

In some circumstances, regulated prices may be determined by measuring the profitability of the company, and applying a multiple to determine allowed prices.

However, the result of this arrangement may be that the net profit of the business may not be able to be increased through traditional activities such as increased economies of scale or increased efficiencies.

Any change to the business operation may result in the regulated prices being altered to result in an unchanged return from the business.

This is the curse of the Communist system, in which effort and actions may be pointless, as no results may actually occur for the party expending the cost or effort.

Managing a utility business may involve increasing volumes through promotion activities, or developing additional services that do not fall within the category of the regulated activities.

5.34.2.12. Manufacturing

Manufacturing is a significant part of most developed economies, including Australia.

This covers a wide range of businesses and operations, from small enterprises conducting manufacturing operations, to large scale production, such as production of cars and trucks.

Manufacturing is a long-term declining industry, as improvements in technology allow the products that meet a market demand to be produced with fewer and fewer resources.

Manufacturing as a major section of the economy is gradually being replaced by service businesses, which are a growth area of the economy.

Small manufacturing operations may involve labour intensive activities.

However, manufacturing is generally a capital-intensive operation, requiring capital investment in equipment and production facilities.

Volumes may be a major issue in manufacturing, as the fixed costs of the operation may be a substantial part of the total costs, and the cost per unit may fall as volumes rise.

This may particularly be the case in the production of commodity items such as televisions, where a large number of manufactures may be able to produce similar items.

In these situations, prices may become a major factor in a purchase decision.

This may lead to an industry consolidating into a few major manufacturers, as the economies of scale in large-scale production may allow items to be produced at lower costs than in the case of small scale producers.

5.34.2.13. Air travel

Air travel may be a capital intensive business, although in many cases aircraft may be leased rather than owned.

Air travel is also a service business, and issues such as advertising, corporate accounts and packaged products may be relevant in the airline industry.

Load management

Load management may be a major issue in managing an airline.

The cost of flying an aircraft from one point to another may essentially be a fixed cost, regardless of the number of passengers travelling on the flight.

Load management may involve altering flight schedules, the number and size of aircraft, the price per ticket, and discount arrangements, to maximise returns based on the number of flights, and the average percentage of seats that are filled on each flight.

A regular scheduled service that flies between two destinations, and carries a single passenger, may result in a large loss for an airline.

However, flights must be made at the schedules times, even if only a single passenger travels on a particular flight.

In this situation, the flight must proceed as scheduled, even if this may result in a significant loss for the airline.

Industry structure

Air travel is a significant industry world wide.

Air travel in many countries may be dominated by a single airline or a few major airlines, due to the large capital costs involved, and the lower prices that may be charged by large operations due to economies of scale.

However, the airline industry in the United States is highly competitive, with a large number of small airlines operating.

Air travel world-wide may operate with slim margins, due to the competition of international flight routes between different airlines.

(** check details)

With only a few manufacturers of large aircraft, and the selection of an airline ticket being largely based on price, prices may fall to the lowest sustainable levels due to competition on major routes.

In the case of domestic air travel, margins may vary considerably from country to country, due to the level of competition and the activities of individual businesses within each region.

Barriers to entry

Barriers to entry may be high within the airline industry, as the minimum size of a commercial airline operation may be quite large.

Beginning as a small airline and gradually expanding may not be practical on major routes, although this may occur in the case of regional airlines servicing particular areas.

Access to airline terminals may be an issue with the establishment of a new airline. (** check details)

Regulations may vary from country to country in relation to leasing and access to airline terminals.

Costs

Major costs involved in operating an airline may include the depreciation or lease costs of aircraft, maintenance, staff costs, and aviation fuel.

The price of aviation fuel may be highly volatile, being based on the oil price which trades in open markets.

Also, it may not be practical to pass the changes in fuel prices directly on to the ticket price, as ticket prices may be updated on an occasional basis, while the price of fuel may change daily.

Airlines may manage this risk by maintained a hedge book of instruments such as futures contracts, to reduce the exposure of the airline to changes in the price of aviation fuel.

5.34.2.14. Services

Service businesses comprise a large part of the economy. (** figures)

Services industries are a growth section of the economy, with new services and types of operation appearing regularly.

This growth has become possible due to technology improvements that have resulted in a reduction in the numbers of people being employed in previously labour-intensive industries such as manufacturing, mining, primary production and administration services.

Service business may include financial services such as banking, insurance and investment management, business services such as property management, professional services such as law, and services such as design operations.

Service delivery may be a labour-intensive activity.

Service businesses may have low capital requirements, and may operate on a cash flow basis.

Service businesses may also have a large proportion of variable costs rather than fixed costs, with volumes being less important in services than in other industries such as manufacturing.

Some large service businesses are in operation, particularly in insurance and banking.

However, many service businesses may operate as small or medium sized enterprises, including sole traders, partnerships, small enterprises, and medium sized listed public companies.

This may occur due to a lack of potential economies of scale in many service operations, and difficulties in coordination within large organisations.

Issues involved in service businesses may include developing a client base, creating products such as packaged services that are attractive to potential clients, and reducing fixed costs through methods such as partnerships sharing office space and administration services.

5.34.2.14.1. Asset management

Asset management is a service business.

Fees may be charged for the service of managing a portfolio of assets, usually as a percentage of the portfolio size.

This may include portfolios of shares, property, interest-bearings securities such as government bonds, international shares, and infrastructure assets such as toll roads.

Products may include funds that invest in a single type of asset, such as Australian shares, of funds that may invest across several major types of asset.

Insolvency risk

Assets within investment trusts and funds may be held in the name of a trustee, and the manager of the fund may not have direct ownership of the assets.

The effect of this arrangement may be that the assets of the fund are not exposed to the risk of insolvency of the manager.

If an asset management company ceases to operate, then an alternative company can be appointed.

This may differ from the case of insurance companies and banks, where the assets may be held within the balance sheet of the organisation.

A failure of the insurance company or bank in these situations may lead to a loss of client's funds.

Liquidity

However, liquidity may be an issue in the case of assets held in trusts, rather than assets held on the balance sheet of the organisation managing the funds.

For example, where a large number of investors may attempt to withdraw funds from an investment such as a property trust within a short period of time, there may be insufficient cash held within the trust to meet the withdrawals.

In this situation, long delays may occur until assets within the fund may be sold to raise cash to meet the redemption requests.

Liquidity may be an advantage of the balance-sheet approach to investment management, used by banks and insurance companies.

In the balance-sheet approach, as the company can pay withdrawals from existing cash reserves, and then sell assets at a later date.

5.34.2.14.2. Education

Education is a service industry.

A large proportion of education services in Australia are operated by non-commercial organisations, and may be funded through a combination of fees charged for courses and funding from government revenues.

However, eduction delivery is also conducted by business enterprises.

This may particularly apply in the case of technical fields and professional development education.

Education businesses may operate on a purely cash flow basis, using rented or hired facilities, while larger organisations may have substantial fixed assets in land and buildings.

5.34.2.14.3. Hospitality

The hospitality industry includes restaurants, hotels, accommodation, events venues, and facilities of all kinds that provide food or accommodation to the general public.

This may include a wide range of facilities and operations, ranging from a single room of accommodation, through to extensive resort complexes.

Hospitality may be a labour-intensive service business, which may often operate on a cash flow basis.

Supplies may be a significant issue in the case of restaurants and hotels, in contrast to many other service businesses, which may involve a range of activities such as administration services, in which few supplies or large items of equipment may be used.

Large Hotels

In the case of large city hotels, a number of international hotel chains may operate hotels in many large cities.

The "occupancy rate" of a hotel may be an important issue in managing a hotel operation.

In a similar way to airline seats, the number of available rooms is a fixed number, while many costs may also be at fixed levels.

The occupancy rate refers to the percentage of rooms that are occupied at any particular time.

The average rate per room may also be important, with rates varying according to the standard rate, the number of bulk discount rooms sold to tourism operators, discounts and special offers, and so on.

Managing prices, discounts and promotion activities may be used to ensure that the occupancy rate and the average room rate remain at sustainable levels.

Other operations

Many hospitality facilities may be operated as individual enterprises.

Start-up activities may be common in this industry, and supplies and equipment may be readily available.

However, the failure rate of these operations may also be high, and issues such as the location of the operation may be important in ensuring that customer levels reach sustainable levels.

The turn-over rate of hospitality businesses may also be high, and a large number of hospitality operations are advertised for sale through business brokers and various publications.

In some cases, a building may be occupied by several different business operators within the space of a few years.

Seasonality

Hospitality may be highly seasonal, with customer levels changing with the time of the year, and possibly with general economic conditions.

Property investment vs. operations

In many cases, buildings may be leased by the business operators.

This may apply in the case of restaurants, and also in the case of large hotels.

In cases where the buildings are owned, the business may effectively be split into two separate activities.

One activity may involve property investment, with capital being raised to purchase the property, and the income from the business operation representing a rental return on the buildings.

The other activity may represent the function itself, such as food service or accommodation activities.

This activity may be reviewed on a cash flow basis, with income from customers, and expenses including an effective rent component in relation to occupying the building.

5.34.2.14.4. Travel & Tourism

Travel may include air travel, coaches, rail and sea transport.

These activities may be capital intensive, with vehicles having a high capital cost.

Fuel may also be a significant expense in some operations.

Many travel facilities are operated by organisations that may maintain a large number of separate transport vehicles.

This may allow the business to operate a regular schedule of services.

A large business may also have less difficulty in raising capital than a small enterprise in some circumstances.

Tourism may include a wide range of facilities that may be visited by a large number of domestic or overseas customers.

Tourism facilities may also involve a significant capital cost, and may require significant levels of re-investment of cash flow in order to maintain existing facilities and develop new facilities.

Travel agencies are service businesses that operate within the travel and tourism industries.

Tourism is effectively an export industry, even though products are not exported to overseas locations.

This occurs due to the fact that the fees paid for entry to facilities by overseas visitors represent income that is received from overseas customers.

In a similar way, performing contract services for overseas customers is also effectively an export business.

5.34.2.14.5. Entertainment

Entertainment may include stage productions, cinemas, and live performances.

Film and music production may be considered a separate industry to live entertainment.

In the case of film and music production, operations may occur on a project basis, with the large capital cost of the production being offset by income from licensing the completed products.

Cinemas are a distribution business, receiving income from customers, and paying license fees to film studios for the right to present films.

Television is also a distribution business, although in some cases, television operators may also perform production activities, producing a range of television programs.

Content supply may be an important issue in the case of cinemas, television and newspapers.

In these situations, a continuous stream of new content may need to be sourced from film studios, production businesses and news services in order to continue presenting updated material.

Income from customers may be highly dependant on the quality and volume of content that the distributor is able to source for presentation.

Production of stage shows and television programs may be a capital intensive activity, involving expenses for an extended period of time, followed by a stream of income from presentations or licence fees.

6. Summary of major concepts & issues

Appearance vs. Existence	The appearance of an object or situation may be a separate issue from the situation actually existing. For example, a positive correlation may be calculated between advertising expenses and sales figures. This figure may occur due to the existence of a link between the two items, or the figure may be due to random chance, and no direct link may actually exist.
Assets	An asset is any item of value that the business owns. This may include some of the following items. • Land and buildings • Equipment • Manufacturing facilities • Cash • Financial assets such as shares and bonds • Intangible assets such as patents and brand names • Abstract property such as music and computer software
Borrowing & Lending	Items may be lent and borrowed in business activity. In general, a regular fee may be paid from the borrower to the lender, for each time period that the item remains in the borrower's possession. This concept may be applied to some of the following situations Asset Fee

Buildings	Rent
Money	Interest
Equipment	Hire payments

Capital

Capital refers to value.

This may also be interpreted as a large block of money.

Capital may represent a sum of cash, a physical asset, money owed to the business, or other items of value.

In contrast to the regular stream of income and expense payments, capital transactions may involve buying and selling assets, and large transfers of cash or value that may occur on an occasional basis.

Cash flow transactions may focus on continuous streams and totals-per-period, while capital transactions may focus on individual transfers, independent of time periods.

Cash Vs. Value

Cash holdings and transfers are a separate issue from value holdings and transfers.

A cash transfer may occur without a value transfer.

Also, a value transfer may occur without a cash transfer.

For example, if cash is used to purchase an item of equipment, the cash balance of the business may reduce, however no change in total value may occur.

In this case, value is simply transferred into a different form, and the value held by the business does not change.

Conversely, if the value of an asset rises or falls,

the value of the business holdings may change, even though no cash transfer has occurred, and no change has occurred in the cash balance.

The holdings of the business are represented by value, not cash, with the cash being only one component of the total value held.

Cash, currency & values

In the financial context, "cash" may generally refer to the balance of bank accounts.

"Currency" may refer to coins and bank notes, or also to balances held in bank accounts

The value of a liquid asset such as a bond does not represent cash, but instead represents the value that the asset may have if it was sold in exchange for cash.

Currency is an asset, and this may be illustrated in the case of foreign currencies.

A business may hold sums of Japanese Yen, Swiss Francs, Netherlands Guilders, and Australian Dollars.

Money held in Australian bank accounts generally represents a holding of Australian dollars.

Commercial activity

Commercial activity may involve the following activities

Trade	Buying and selling assets, materials and products
Production	Manufacturing items from raw materials, or creating abstract items
Services	Performing services in exchange for payment.

Continuous & project based activity

Some business activities are continuous, and may involve a steady stream of income and expenses.

Manufacturing production and service delivery may be examples of this type of activity.

Other business activity may be project-based, and may involve several stages and may operate for a finite period of time.

This may involve cash outflows in the early stages of a project, followed by cash inflows from product sales or license fees.

Project-based activities may include film production, computer software development, construction projects, new product developments, and advertising campaigns.

Debt

Debt involves a situation in which money is owed to the business, or the business owes money to another party.

Debt may arise due to the repayment of money that was previously borrowed, or due to some other reason, such as a payment being required for a product that has been delivered.

Diversification

If a single large risk or exposure is split into several smaller risks, the total volatility or risk of the activity may be reduced.

For example, a business that had a large number of customers or performed several activities may have a less volatile cash flow and be exposed to less risk of a large fall in cash flow than a similar-sized business that only serviced a small number of customers or performed a single activity.

All else being equal, volatility or risk may decrease in proportion to the square root of the number of independent risks within the total.

For example

Number of Risks	Total Risk

1	100%
2	71%
3	58%
4	50%
5	45%
10	32%
100	10%
1000	3%

Equity

Equity is another name for the net assets of the business.

The equity value is equal to the total assets less the debts of the business.

This may be represented in the following formula.

$$\text{equity} = \text{assets} - \text{debts}$$

Equity may be viewed in two ways.

The shareholder-centred perspective views equity as the ownership of the business assets.

The business-centred perspective views equity as a source of capital, as an alternative to debt, to be used in the operation of the business.

Equivalent structures

In general, different financial structures may be equivalent in the absence of different interest rates and rates of return.

For example, purchasing a building with cash has the same financial result as using a loan to purchase a property, assuming that the equity funds could be invested in an alternative investment, returning the same rate of return as the debt interest rate.

Leasing a building has the same effect as purchasing the building, if an equivalent amount

of payments are invested in an alternative investment with the same gearing level and rates of return as the building investment.

In the case of loan structures, value is not directly gained or lost simply through changing to alternative structures, such as an interest-only or amortising loan.

Feedback

Feedback may involve checking or measuring the results of a process.

This may be an essential step in improving a process.

Technically, the term "feedback" refers to a process in which the output of the process also affects the input, or may alter the process itself.

For example, this may include issues such as measuring the percentage of fault rates in a production process, contacting customers to check that products are delivered as ordered and perform as expected, testing of product prototypes, and comparing the actual results of a project development against the original project schedule.

Increasing profit

Profit may be increased in two fundamental ways.

- Increasing income
- Reducing expenses

In practice, funds may need to be invested in new products and updated facilities, equipment and processes, in order to create a stable or increasing income.

Leverage

Leverage involves a situation in which a small change in one value may produce a large change in another value.

Financial leverage occurs when a large asset and a

large debt figure are separated by a small net asset figure.

In this situation, a small rise or fall in the asset value may result in a large rise or fall in the net asset value.

Operational leverage occurs when the income and expense figures are large, and are separated by a small net profit figure.

In this situation, a small change in income or expenses may lead to a large change in net profit.

Production leverage occurs when a high proportion of the costs are fixed costs.

In this situation, a small change in production and sales volumes may result in a large change in net profit.

Probability of cash flows

Uncertain future cash flows may have a range of possible values.

This may include a cash flow than may or may not occur, with either a fixed value or a value of zero.

Where a cash flow may have a range of possible values, the effective value of the cash flow may be calculated from the possible values, and the probability of each value occurring.

This may be summarised in the following formula

Effective value = sum of "probability x value" for each possible value of the cash flow

In the case of a cash flow with a single value that may or may not occur, this formula may reduce to the following formula.

	Value = probability x amount In this formula, the amount is the size of the cash flow, and the probability is the probability that the cash flow will occur. If a cash flow may or may not occur, the effective value of the potential cash flow may be lower than the value of an equivalent cash flow that is assumed to be certain to occur.
Production	Manufacturing involves creating physical items from raw materials. Abstract items, such as building designs, may also be created during business activity.
Profit	Profit is the change in the business assets, as a result of business activity. This may be represented in the following basic form Profit = income – expenses + rise or fall in asset values In the case of investments such as property holdings and shares, the asset values may rise. However, in the case of general business operations involving equipment, the asset values may decline, and this may be recorded as the depreciation value.
Services	Services involve commercial activity that does not involve creating items, such as managing a project, or performing maintenance of equipment.
Time value of money	Cash flows of the same size that occur on different dates are not equivalent. This may occur due to the interest that could be received or charged on early income or expense payments.

The present value of a future cash flow or asset value may be calculated using the following formula.

$$\text{present value} = \frac{\text{future value}}{\left(1 + \frac{\text{interest rate}}{100}\right)^{\text{number of years}}}$$

Trade

Trade involves exchanging one item for another.

Trade may include:

- “buying”, exchanged cash for an item.
- “selling”, exchanging an item for cash.
- “barter”, exchanging two physical items.
- “foreign exchange”, exchanging amounts in two currencies.

Value is not gained or lost directly from a trade.

A trade simply involves exchanging one item for another item of similar value.

The value of a product is created when the item is made, not when the item is sold.

Selling a product simply involves exchanging an item for an amount of cash of a similar value.

Appendix A - Example business plan

Description

Manufacture of salt and pepper shakers for commercial use

Participants

Bill Smith, Lisa Jones, Sally McIntire, Chris Lian, Paul Deveen.

Product opportunity & background

Lisa has previously managed a coffee shop and had continual problems with usage and supply of salt and pepper shakers.

The alternatives that are available on the market at present are manufactured in an area with much lower humidity than the area that the prospective business operates in. As a consequence of this, salt shakers available have narrow holes, which frequently become blocked with damp salt due to the humid conditions. This is a time-consuming and frustrating process to unblock these.

Also, the commercially available salt and pepper shakers are all manufactured from glass, which leads to frequent breakage.

Glassware replacement is a regular cost of food service businesses such as bars and restaurants, and although it may not be a major expense, it may be an additional item for the business to manage.

Business concept

This business plan is based on producing stainless-steel commercial salt and pepper shakers, as an alternative to the glass products that are currently available.

The target market may initially involve food service businesses within the local region.

In the case of a successful development, expansion may involve expanding sales into a wider area, or expanding into domestic salt and pepper shakers, using a range of designs for household use.

Test Marketing

Sample stainless steel salt and pepper shakers have been made to demonstrate the idea.

Lisa and Chris have approached a number of coffee shops and restaurants to gauge the reception to the idea.

Although they met with a mixed reception, some restaurant managers responded that they had also experienced similar problems, and that they would be interesting in considering the products if they were available on a reliable basis at a similar cost to the existing products.

Skills & experience

Lisa has previously managed a coffee shop for an extended period of time, and is familiar with the ordering processes and operations of the food service industry.

Chris has experience with small-scale equipment operation, and is broadly qualified to operate the metal-pressing equipment that would be needed to produce the items.

Sally has managed a department of a large manufacturing company, and has experience with managing staff, allocating budgets and producing financial and written reports.

There is little experience within the group in raw materials ordering or marketing.

However, some early enquiries with raw material suppliers have suggested that this area may not involve a great deal of difficulty.

In terms of marketing, a plan has been developed to approach the marketing issues, as described in the business plan.

Funding

Chris will be investing $15 in capital at the beginning of the enterprise, while Paul will be contributing $18 and Lisa will be investing $10.

Bill and Sally will not be investing initial capital.

Involvement

Paul will be a passive investor, and will not be involved in the operations of the enterprise. A salary will not be drawn by Paul.

Lisa, Chris and Sally will work on a full-time basis within the operations.

Bill will work an equivalent of one day a week managing the financial arrangements, with the actual activity happening in the evenings and weekends.

Salaries & investment

Salaries have been allocated in the budget for Lisa, Chris, Sally and Bill.

Bill and Lisa will not be drawing their salaries in cash, but will accumulate the salaries as accounting entries in the budget.

When the enterprise reaches a cash flow positive condition, the outstanding amounts will be paid out from excess cash flow, and no additional expenses will be made until the salary amounts are cleared.

Due to the fact that the business may fail and that the outstanding salary amounts may be lost, Bill and Lisa's salary amounts will be 20% higher than Chris', to compensate for the fact that Chris is drawing a salary in cash and may face less risk that Bill and Lisa, and to compensate of the inconvenience of the delayed payment..

Bill and Sally are not investing funds at the commencement of the enterprise.

However, both wish to re-invest the salary amounts in shares in the enterprise.

The final share allocation for each person will be calculated from the total of the initial amount of money invested, plus the salary amounts that are re-invested to purchase additional shares.

Activity schedule & time frames

	Activities	Target events
Month 1	Purchase & install metal pressing machine.	
Month 2	Produce & distribute samples. Arrange material supplies and develop operating procedures.	Equipment fully installed and operational.
Month 3	Refine test samples and alter designs.	
Month 4	Refine operating procedures.	
Month 5	Arrange full supply delivery.	
Month 6	Commence full production.	
Month 7	Commend ongoing marketing activities.	Minimum capital point.
Month 8		Positive cash flow.
Month 9		
Month 10		
Month 11		
Month 12		
Month 13		
Month 14		
Month 15		Initial capital level recovered.

Budget

The budget for the enterprise is as follows

	Income	Expenses	Remaining Funds
			400
Month 1	0	100	300
Month 2	0	20	280
Month 3	0	10	270
Month 4	0	20	250
Month 5	0	30	220
Month 6	30	40	210
Month 7	30	40	200
Month 8	50	40	210
Month 9	50	40	220
Month 10	70	40	250
Month 11	70	40	280
Month 12	70	40	310
Month 13	70	40	340
Month 14	70	40	370
Month 15	70	40	400
Month 16	70	40	430
Month 17	70	40	460
Month 18	70	40	490

A separate list of detailed expenses has been drawn up, including amounts for cash salaries, amounts for nominal salaries to be accumulated, advertising expenses, rent, the purchase of the metal pressing machine, raw materials, petrol & office expenses, utilities including electricity & telephone costs, and registration costs.

Roles & responsibilities

Chris will operate the machinery and produce the finished items.

Sally will perform the administration, order suppliers and deal with customers.

Lisa and Bill will perform the sales and marketing.

Decision making & review

A company will be formed for the enterprise.

All five participants will be directors of the company.

Each participant has agreed to the allocation of roles.

Major decisions will be made through a monthly meeting of the full group.

Sally has been given discretion to spend amounts up to $5 per month for office expenses without a vote from the full group.

Each participant has agreed to a 12 month timeframe for the initial stage of the enterprise.

At the end of the twelve months, a vote will be taken on whether to continue with the operation, or to wind up the enterprise.

In the event that a single individual withdraws from the operation before the twelve months has been reached, a full meeting will be held of the remaining participants, and a vote will be taken on whether to continue to the twelve month point or whether to end the enterprise at that time.

Target Market

The initial target market involves restaurants and food service outlets within a regional area.

According to a survey of telephone books and restaurant directories, there are approximately 450 restaurants within a region that is serviceable by car.

Successful sales to 10% of these restaurants would be sufficient to reach a break-even cash flow.

Beyond this, marketing exercises could be conducted interstate without any great difficulty.

Marketing approach

Lisa and bill will conduct marketing directly with restaurants within the region.

This will be done by telephone contact, and arranging to demonstrate the items where possible to the person who selects the salt and pepper shakers for ordering.

A mailing list of restaurants within a wider area has been located by contacting market research agencies, and a mail out of leaflets will be conducted to the restaurants within the area.

Major risks

Although the items will need to be replaced on a regular basis, they should have a longer lifespan that the existing glass items.

There is a chance that there may be an initial period of good sales, and that expansion into a wider area will be needed to sustain the rate of sales, once the existing market has been saturated.

However, after the twelve month period, sales from the original area should begin to reappear as replacements are required.

The manufacturing process has not been conducted before, and although some samples have been made, there may be teething problems with the actual production.

Interest in the product seems good, although there is no way to determine the actual result until production commences.

Backup facilities

If the budget is met and the estimated sales come through, then half the initial capital will be used before the cash flow becomes positive.

This leaves the other half of the initial capital to handle unexpected expenses and problems that may occur before the cash flow becomes positive.

Bill would prefer not to perform the marketing process, however he has agreed to allocate an additional day each week if Lisa and Bill find that the

time delay involved in demonstrations is preventing enough initial sales from being made.

Expansion possibilities

In the event that the enterprise reaches cash flow positive and sales are steady, several future directions could be taken.

These include expansion interstate, and expansion into domestic salt and pepper shakers.

Investigation has determined that domestic items are generally manufactured by manufacturers of general household supplies, as part of a wide range of kitchen implements.

This may be a small part of these company's product lines, and no particular attention seems to be paid to the design or operation of the domestic salt and pepper shakers.

This could provide the opportunity for a range of specialist items, with higher quality mechanisms and a range of different designs.

Possible long-term options have been discussed in general as part of the business plan preparation.

In the business reaches a stable cash flow-positive situation, a full review of future possibilities will be made at that point.

This may involve a two-day full time review process, with each member of the group briefly summarising their thoughts on the future direction, followed by detailed discussion of the possibilities.

Lisa has agreed to prepare a list at the time of the review of the possible volume of sales that could be achieved for each alternative, while Paul will arrange quotes for supplies and cost amounts.

Exit Arrangements

After a four year period, if the enterprise is still operating and one of the participants wishes to exit, an independent valuation of the shares will be arranged.

Any cash within the company, apart from a buffer for working capital, will then be used to repurchase the participant's shares at the valuation price.

If there is insufficient cash available, then the income from operations will be split in half.

Half the income will be available for dividends and reinvestment, while the other half will be used to repurchase the shares until all the shares have been repurchased.

If more than one participant wishes to exit, the available cash will be used to repurchase the shares of each participant on a pro-rata basis.

In the case that all the participants wish to exit, and the business is still in operation, the business will be offered for sale.

If a buyer is not located within a reasonable period of time, then the company will be wound up.

Appendix B - Example Service Contract

The following example details a possible service contract or internal service level agreement.

An actual service contract or service level agreement may involve more detailed text than this example.

However, this example may demonstrate some of the key points and issues that may be raised.

Parties	This service contract is between company ABC, the "client", and company XYZ, the "service provider", for the provision of administration services in regard to retail electricity connections.
Services	Schedule XX contains a list of the services to be provided. These are Administration of customer applications to connect and disconnect electricity services. Billing of customers for electricity usage. Management of overdue accounts. Providing customer support services through telephone contact. Maintaining records of customer details and accounts. Providing mail-outs to customers as specified in this agreement.
Customer Mailouts	The service provider will perform mail-outs of letters to customers, in the format provided by the client, and to the specified group of customers.
Fees	The following fees will apply A connection request $1.00 per transaction

A disconnection request
$.80 per transaction

Alteration to details or service
$ 1.34 per transaction

Customer service provision
$ 1234 monthly

Mail-outs
$123 plus $0.43 per item

Reporting

A report should be submitted monthly to the client, containing the following details.

The number of transactions processed of each type.
The current number of customers with each account type.
The average response time to telephone enquiries.
Details of response times as listed below.
The average processing time for transaction requests.
The number & amount of overdue accounts.
Statistics should be calculated from computerised records of response times and processing volumes.

Service Levels

Service levels should meet the following criteria

The average time taken to answer telephone enquiries should not to exceed 3 minutes for the complete month.
99% of telephone enquiries should be answered within 7 minutes.
The average time taken to answer telephone enquiries, during peak times, should not to exceed 5 minutes for more then 10 hours during the month, with each calculation based on whole hours beginning at 1:00 for example.
Average processing time for transactions should not exceed 2 days.
95% of transactions should be processed within 5 days.

Customer Service	Each one-thousandth customer enquiry to result in the customer being to be asked whether they would like to complete a short customer service survey, in return for $10 discount on their next account. The selection of the customer to be based on automatic selection, by the computerised telephone processing system. Survey questions are attached in schedule XX. Rating of overall service, and service for a particular enquiry, not to exceed 20% ratings for "average", or 10% ratings for "poor" or "very poor"
Volumes	The following volumes may apply to this service Transactions 1234 per month Telephone enquiries 12234 per month In cases where the number of transactions exceeds this level, service will continue on a "best endeavours" basis, however penalties for failing to meet the specified response times will not apply. Requirements for customer service standards will continue to apply.
Payment Terms	Payments are due 30 days after the issue of an invoice to the client.
Defaults and Penalties	Overdue accounts Payments due that are not received in full within 7 days after the due date will attract an administration fee of $10, and interest calculated from the due date at the rate of 12% per annum. The fee will be added to the existing account, while interest will be added to the following account Service Standards

	Where service standards that are listed in this agreement are not met, the fee for that month will be payable at the option of the client. The client must give notice of electing to exercise the option to decline payment within 7 days after receiving the invoice, otherwise the account becomes payable. This option does not accumulate, and a payment of an account cannot be reversed in a following month. Withdrawal of service If any payment has not been received within 90 days after the due date, the service provider may withdraw service, either temporarily or permanently. Amounts received from the client are to be applied to the account that has the longest period of time since the due date.
Ownership Of information	Information including customer details, account details, and transaction histories remains the property of the client. The service provider must maintain adequate back-up facilities for computer data storage, and these facilities may be inspected by the client on a semi-annual basis.
Payment Authority	All payments and receipts will be processed through accounts in the client's name. The service provider is granted authority, by this contract, to make payments to customers regarding refunds of credit account balances.
Credit risk & overdue Accounts	Credit risk remains with the client. Overdue accounts are to be processed with two reminder letters. Accounts overdue by more than 90 days will be referred to a separate debt collection agency.
Auditing	Financial accounts will be audited by external

	auditors. Customer service standards will be audited by a formal customer service audit, conducted by an external agency. This will include submitting anonymous transactions, and contacting customers directly to assess customer service standards.
Termination of Agreement	Either party to this agreement may terminate the contract by giving 90 days notice in writing to the other party, of an intention to withdraw from the agreement.

Appendix C - Sample legal documents

(** mortgage etc)

Contract

Contract of Sale

It is hereby agreed that Mary Jane Smith will sell the property at 23 Maple Court to Susan Jones for the sum of one hundred dollars, with the transaction to be settled on the 4th of November 2001.

(signature and date)

Mary Jane Smith

(signature and date)

Susan Jones

Receipt

This statement acknowledges that fifty dollars has been received by Christopher McIntire from Bill Jones as full payment for the property at 53 Acacia Road.

(signature and date)

Christopher McIntire

Loan

An agreement is hereby made for Bill Smith to loan Paul Vale ten dollars.

Interest will be due quarterly at the rate of eight percent per annum, based on the principal amount outstanding on each day through the quarter.

Interest payment dates will be the 31st of March, the 30th of June, the 30th of September and the 31st of December.

The principal amount will be repaid at the end of a five year period, being the date 12th June 2003.

Principal amounts may be repaid earlier by Paul at any time.

Part of the loan principal, or the entire outstanding loan amount, may be called for repayment on ninety days notice issued by Bill to Paul.

(signed and dated)	(signed and dated)
Bill Smith	Paul Vale

Appointment of an agent

Authorisation to act as an agent

I, Louise Jones, hereby authorise Sally O'brien to bid for the purchase of the property at 592 South Road on my behalf as my agent, with the maximum bid lodged not to exceed thirty dollars.

(signature and date)

Louise Jones

Trust deed (** check details)

Deed of trust

It is solemnly declared that the land and buildings at 43 Blake Street, together with a sum of ten dollars, will be transferred from Marly Ivain of 72 Branch Street, as settlor (**check), to Ignatius Smith of 32 Hill Street, as trustee, to be held on trust on behalf of Michael Jones of 62 Bunton Lane, as beneficiary, until he reaches eighteen years of age.

Income	Income from the trust property, including rents and interest, is to be held as trust property and included with the funds to be transferred on expiry of this arrangement.
Trust Expenses	Expenses related to maintaining and managing the trust property, including property maintenance costs, insurances, taxes, property management fees and so forth may be drawn from the trust funds.
Trustee expenses	The trustee may draw funds from the trust for reasonable expenses incurred in administering the trust, including legal costs and travel expenses.
Resignation of trustee	The trustee may resign from this trust arrangement by issuing a declaration of resignation, and appointing an alternative party who consents to holding the trust property under this trust arrangement.
Revocation	This trust arrangement may be revoked by a notice issued by the settlor, in which case the trust property will be returned to the settlor

Signed, sealed and delivered at 72 Branch Street on 12 July, 2001

(signature and date)

Marly Ivain

Appendix D - Ratios and margins by industry

(** summary of ranges for ratios, margins etc for various industries and types of business)

Appendix E - Monthly repayments of an amortising loan

Repayments per $1,000 of loan principal.

Number of Years	Interest Rate 5.0%	6.0%	7.0%	8.0%	9.0%	10.0%	11.0%	12.0%	13.0%	14.0%	15.0%	16.0%	17.0%	18.0%
1	85.61	86.07	86.53	86.99	87.45	87.92	88.38	88.85	89.32	89.79	90.26	90.73	91.20	91.68
2	43.87	44.32	44.77	45.23	45.68	46.14	46.61	47.07	47.54	48.01	48.49	48.96	49.44	49.92
3	29.97	30.42	30.88	31.34	31.80	32.27	32.74	33.21	33.69	34.18	34.67	35.16	35.65	36.15
4	23.03	23.49	23.95	24.41	24.89	25.36	25.85	26.33	26.83	27.33	27.83	28.34	28.86	29.37
5	18.87	19.33	19.80	20.28	20.76	21.25	21.74	22.24	22.75	23.27	23.79	24.32	24.85	25.39
6	16.10	16.57	17.05	17.53	18.03	18.53	19.03	19.55	20.07	20.61	21.15	21.69	22.25	22.81
7	14.13	14.61	15.09	15.59	16.09	16.60	17.12	17.65	18.19	18.74	19.30	19.86	20.44	21.02
8	12.66	13.14	13.63	14.14	14.65	15.17	15.71	16.25	16.81	17.37	17.95	18.53	19.12	19.72
9	11.52	12.01	12.51	13.02	13.54	14.08	14.63	15.18	15.75	16.33	16.92	17.53	18.14	18.76
10	10.61	11.10	11.61	12.13	12.67	13.22	13.78	14.35	14.93	15.53	16.13	16.75	17.38	18.02
11	9.86	10.37	10.88	11.42	11.96	12.52	13.09	13.68	14.28	14.89	15.51	16.14	16.79	17.44
12	9.25	9.76	10.28	10.82	11.38	11.95	12.54	13.13	13.75	14.37	15.01	15.66	16.32	16.99
13	8.73	9.25	9.78	10.33	10.90	11.48	12.08	12.69	13.31	13.95	14.60	15.27	15.94	16.63
14	8.29	8.81	9.35	9.91	10.49	11.08	11.69	12.31	12.95	13.60	14.27	14.95	15.64	16.34
15	7.91	8.44	8.99	9.56	10.14	10.75	11.37	12.00	12.65	13.32	14.00	14.69	15.39	16.10
16	7.58	8.11	8.67	9.25	9.85	10.46	11.09	11.74	12.40	13.08	13.77	14.47	15.19	15.91
17	7.29	7.83	8.40	8.98	9.59	10.21	10.85	11.51	12.19	12.87	13.58	14.29	15.02	15.76
18	7.03	7.58	8.16	8.75	9.36	10.00	10.65	11.32	12.00	12.70	13.42	14.14	14.88	15.63
19	6.80	7.36	7.94	8.55	9.17	9.81	10.47	11.15	11.85	12.56	13.28	14.02	14.76	15.52
20	6.60	7.16	7.75	8.36	9.00	9.65	10.32	11.01	11.72	12.44	13.17	13.91	14.67	15.43
21	6.42	6.99	7.58	8.20	8.85	9.51	10.19	10.89	11.60	12.33	13.07	13.82	14.59	15.36
22	6.25	6.83	7.43	8.06	8.71	9.38	10.07	10.78	11.50	12.24	12.99	13.75	14.52	15.30
23	6.10	6.69	7.30	7.93	8.59	9.27	9.97	10.69	11.42	12.16	12.92	13.69	14.46	15.25
24	5.97	6.56	7.18	7.82	8.49	9.17	9.88	10.60	11.34	12.10	12.86	13.63	14.42	15.21
25	5.85	6.44	7.07	7.72	8.39	9.09	9.80	10.53	11.28	12.04	12.81	13.59	14.38	15.17

Repayments can be calculated by multiplying the amount from the table by the number of thousands of dollars of the loan amount.

For example, a loan of $5,000 at 9% interest over 5 years would have repayments of 20.76 x 5 = $103.80 per month.

Appendix F – Model Accounts

(** full set of model accounts)

Appendix G – Sample basic accounts & analysis

(** sample basic accounts, margins and ratios)

Appendix H – Option Pricing

(** option pricing bookmark)
(** black & scholes model)

Appendix I - Summary of formulas

(** formula summary bookmark)

Conventions and symbols

y	The interest rate per period, in decimal format
n	The total number of periods
amount	The value of a single cash flow
payment	Thr payment amount per period
present value	The value on the current date, or an early date
future value	The value at a future date

All interest rates and discount rates are used in decimal format in this section, not percentage format.

For example, an interest rate of 8.5% would be included in a calculation as 0.085.

Sum

The following symbol means “the sum of”. This symbol is the uppercase Greek letter “sigma”.

$$\Sigma$$

This involves adding the individual numbers together.

For example, a situation may involve three interest rates, 10%, 3% and 7%.

The following representation could be used to represent the sum of the three values.

$$\text{Total} = \sum \text{interest rate}$$

$$= 10 + 3 + 7$$

$$= 20$$

This could also be expressed in the form

$$\sum_{i} x_i$$

Product

The following symbol means “the product of”. This involves the numbers being multiplied together.

The symbol is the uppercase Greek letter “Pi”.

$$\prod$$

For example, three values may be involved in a particular situation, 1.2, 1.5 and 1.1.

The product of the three values could be expressed in the following way.

$$\text{Total} = \prod \text{values}$$

$$= 1.2 \times 1.5 \times 1.1$$

$$= 1.98$$

This could also be expressed in the following way.

$$\prod_{i} x_i$$

Production vs. Licensing

Production (profit per period)

$$\text{profit} = (\text{price per unit} - \text{cost per unit}) \times \text{number of units} - \text{fixed cost per period}$$

Licensing (profit since project commencement)

$$\text{profit} = \text{sale price per unit} \times \text{number of units} - \text{total development cost}$$

Per-Share Figures

$$\text{number of shares} = \frac{\text{total dividend payments}}{\text{total dividends per share}}$$

$$\text{amount per share} = \frac{\text{total amount}}{\text{number of shares}}$$

$$\text{total amount} = \text{amount per share} \times \text{number of shares}$$

$$\text{operational value} = \text{share price} \times \text{number of shares}$$

Margins & ratios

$$\text{gross profit margin} = \frac{\text{EBITDA}}{\text{revenue}}$$

$$\text{EBIT margin} = \frac{\text{EBIT}}{\text{revenue}}$$

$$\text{net profit margin} = \frac{\text{net profit}}{\text{revenue}}$$

$$\text{capital expansion ratio} = \frac{\text{capital expenditure}}{\text{depreciation}}$$

$$\text{gearing} = \frac{\text{debt}}{\text{assets}}$$

$$\text{Interest cover} = \frac{\text{EBIT}}{\text{interest}}$$

$$\text{payout ratio} = \frac{\text{dividend paymeny}}{\text{net profit}}$$

$$\text{payout ratio} = \frac{\text{dividend per share}}{\text{earnings per share}}$$

Yields & Returns

$$\text{return on assets} = \frac{\text{EBIT}}{\text{Assets}}$$

$$\text{return on equity} = \frac{\text{net profit}}{\text{equity}}$$

$$\text{ROE} = (1 - \text{tax rate}) \times \left(\text{ROA} + \frac{g}{1-g} (\text{ROA} - \text{debt interest rate}) \right)$$

g = gearing ratio

$$\text{excess return on equity} = \frac{\text{net profit} - \text{equity} \times \text{equity return rate}}{\text{equity}}$$

$$\text{excess return on assets} = \frac{\text{net profit} - \text{equity} \times \text{equity return rate}}{\text{assets}}$$

$$\text{earnings yield} = \frac{\text{net profit}}{\text{operational value}}$$

$$\text{earnings yield} = \frac{\text{earnings per share}}{\text{share price}}$$

$$\text{earnings yield} = \frac{1}{\text{price earnings ratio}}$$

$$\text{earnings yield} = \frac{\text{net profit}}{\text{operational value}}$$

$$\text{price earnings ratio} = \frac{1}{\text{earnings yield}}$$

$$\text{dividend yield} = \frac{\text{dividend per share}}{\text{share price}}$$

$$\text{return} = \frac{\text{future value}}{\text{present value}} - 1$$

$$\text{total return} = \left(\prod_i 1 + r_i \right) - 1$$

$$\text{geometric average} = \left(\prod_i 1 + r_i \right)^{\frac{1}{n}} - 1$$

Debt rates & payments

$$\text{interest} = \text{principal} \times \frac{\text{interest rate}}{100} \times \frac{\text{number of days}}{365}$$

$$\text{average rate} = \frac{\text{sum of "principal} \times \text{interest rate " for each loan}}{\text{total principal}}$$

$$\text{average rate} = \frac{\text{interest expense}}{\text{debt}} \quad \text{(historical average)}$$

Manufacturing

Production

$$\text{capacity urilisatio n} = \frac{\text{number of items produced}}{\text{design capacity of the plant}} \times 100$$

$$\text{materials usage per item} = \frac{\text{volume of material used}}{\text{number of items produced}}$$

$$\text{materials usage efficiency} = \frac{\text{volume of material in finished products}}{\text{volume of material used}} \times 100$$

$$\text{availabili ty rate} = \frac{\text{hours availabile for use}}{\text{tota hours of potential production}} \times 100$$

$$\text{fault rate} = \frac{\text{number of faulty items produced}}{\text{total number of items produced}}$$

Plant structure

$$\text{automation level} = \frac{\text{depreciati on}}{\text{depreciati on} + \text{labour cos ts}} \times 100$$

$$\text{average equipment age} = \frac{\text{sum of the age of each item}}{\text{number of items}}$$

$$\text{non} - \text{depreciati ng equipment} = \frac{\text{number of non} - \text{depreciati ng machines}}{\text{total number of machines}} \times 100$$

$$\text{non} - \text{depreciati ng equipment} = \frac{\text{var iable cos ts used by non} - \text{depreciati ng equipment}}{\text{total var iable cos ts}} \times 100$$

$$\text{ocupancy capital int ensity} = \frac{\text{equipment \& facilities assets}}{\text{building occupancy cos ts}}$$

$$\text{occupancy utilisatio n} = \frac{\text{net profit}}{\text{building occupancy cos ts}}$$

$$\text{production capacity} = \text{machine capacity} \times \frac{\text{average run time}}{\text{average run time} + \text{average down time}}$$

Fixed & variable costs

$$\text{cost per unit} = \text{variable cost per unit} + \frac{\text{fixed costs}}{\text{num units}}$$

$$\text{cost per unit} = \text{variable cost per unit} + \frac{\text{fixed cost}}{\text{design volume} \times \text{capacity utilisation}}$$

$$\text{fixed cost per unit} = \frac{\text{fixed costs}}{\text{num units}}$$

$$\text{fixed cost per unit} = \frac{\text{fixed cost}}{\text{design volume} \times \text{capacity utilisation}}$$

Margins & returns

$$\text{production leverage} = \frac{\text{num units} \times (\text{unit sale price} - \text{unit variable cost})}{\text{num units} \times (\text{unit sale price} - \text{unit variable cost}) - \text{fixed costs}}$$

$$\text{break-even sales volume} = \frac{\text{fixed costs}}{\text{sale price per unit} - \text{variable cost per unit}}$$

$$\text{production margin} = \frac{(\text{sale price per unit} - \text{variable cost per unit})}{\text{sale price per unit}}$$

$$\text{sales margin} = \frac{\text{num units} \times (\text{sale price per unit} - \text{variable cost per unit}) - \text{fixed costs}}{\text{num units} \times \text{sale price per unit}}$$

$$\text{return on assets} = \frac{\text{earnings before interest \& tax}}{\text{assets}}$$

$$\text{ROA} = \text{sales capacity} \times \text{production margin} \times \text{capacity utilisation} - \text{fixed cost ratio}$$

Terms for the ROA formula

$$\text{sales capacity} = \text{sales price} \times \frac{\text{design volume}}{\text{assets}}$$

$$\text{fixed cost ratio} = \frac{\text{fixed costs}}{\text{assets}}$$

$$\text{capacity utilisation} = \frac{\text{number of units produced}}{\text{design volume capacity}}$$

$$\text{net profit} = \text{num sales} \times (\text{sale price per unit} - \text{variable cost per unit}) - \text{fixed costs}$$

$$\text{net profit} = \text{production margin} \times \text{sales value} - \text{fixed costs}$$

$$\text{net profit} = (\text{sale price per unit} - \text{variable cost per unit}) \times \text{capacity utilisation} \times \text{design capacity} - \text{fixed costs}$$

Economies of scale

$$\text{cost per unit} = a \times \text{volume}^{b}$$

$$b = \frac{\ln\left(\frac{\text{cost}2}{\text{cost}1}\right)}{\ln(\text{volume}2) - \ln(\text{volume}1)}$$

$$a = \text{cost}1 \times \text{volume}1^{-b}$$

Single production volume & cost data

$$a = \text{total costs} \times \text{volume}^{-(b+1)}$$

Rule of thumb

$b = -0.74$ (** check)

$$a = \text{cost per unit} \times \text{volume}^{0.74}$$

(** economies of scale calcs, exponential curves using various bases vs. polynomial curves)

Probability

$$\text{probability of not occuring} = 1 - \text{probability of occuring}$$

$$\text{average number of events} = \text{number of trials} \times \text{probability}$$

Equally likely events

$$\text{probability} = \frac{1}{\text{number of items}}$$

Historical events

$$\text{probability} = \frac{\text{actual events or value}}{\text{total events or value}}$$

Uncertain cash flows

$$\text{value} = \text{amount} \times \text{probability}$$

$$\text{value} = \text{sum of "value} \times \text{probability" for each possible outcome}$$

$$\text{value} = \sum_{i} \text{probability}_i \times \text{value}_i$$

Multiple outcomes of a single event

$$\text{probability of outcome "a" or "b"} = \text{probability of outcome "a"} + \text{probability of outcome "b"}$$

Two separate events both occurring

$$\text{probability of both "a" and "b"} = \text{probability of "a"} \times \text{probability of "b"}$$

Time-based events

$$\text{probability} = 1 - (1 - \text{single\_period\_probability})^{\text{number of periods}}$$

Discrete linear distributions

$$\text{probability} = \frac{1}{\text{number of possible outcomes}}$$

Continuous linear distributions

$$\text{probability} = \frac{\text{maximum range value} - \text{minimum range value}}{\text{maximum possible value} - \text{minimum possible value}}$$

Delta

$$\text{maximum loss} = \text{current value} - \text{value at worstcase market price}$$

$$\text{delta} = \frac{\text{the change in the output price}}{\text{a small change in the input price}}$$

Correlation & regression

(** correlation & regression formulas)

$$\text{r-squared} = \text{correlation} \times \text{correlation}$$

$$\text{secondvalue} = a \times \text{firstvalue} + b$$

$$a = \frac{\text{standard deviation of second data series}}{\text{standard deviation of first data series}} \times \text{correlation}$$

Accuracy tests

(** confidence intervals, t-tests

Standard Deviation

(** standard deviation formula)

$$\text{standard deviation} = \text{standard deviation per period} \times \sqrt{\text{number of periods}}$$

Portfolio standard deviation

$$\text{standard deviation} = \sqrt{\text{sum of all combinations of } w_1 \times w_2 \times sd_1 \times sd_2 \times r}$$

$$\sigma_p^2 = \sum_i \sum_j w_i w_j \sigma_i \sigma_j r_{i,j}$$

Portfolio standard deviation, independent variables

$$\text{standard deviation} = \sqrt{\text{sum of } w^2 \times \text{standard deviation}^2 \text{ for each asset}}$$

$$\sigma_p^2 = \sum_i w_i^2 \sigma_i^2$$

Portfolio standard deviation, independent variables, equally weighted

$$\text{standard deviation} = \frac{\text{standard devaiation of an individual risk}}{\sqrt{\text{number of risks}}}$$

Extreme movements

Fixed average

$$\text{size of the change} = \text{new value} - \text{average}$$

$$\text{lower value} = \text{average} - \text{number of standard deviations} \times \text{standard deviation}$$

$$\text{upper value} = \text{average} + \text{number of standard deviations} \times \text{standard deviation}$$

Random walk

$$\text{size of change} = \frac{\text{new value} - \text{old value}}{\text{old value}}$$

$$\text{upper value} = \text{current value} \times (1 + \text{number of standard deviations} \times \text{standard deviation}$$

$$\text{lower value} = \text{current value} \times (1 - \text{number of standard deviations} \times \text{standard deviation}$$

$$\text{number of standard deviations} = \frac{\text{size of the change}}{\text{standard deviation}}$$

Present & future values

$$\text{present value} = \frac{\text{amount}}{(1 + y)^n}$$

$$\text{future value} = \text{amount} \times (1 + y)^n$$

Part of one period

$$\text{present value} = \frac{\text{amount}}{\left(1 + \frac{\text{days}}{\text{days in period}} \times y\right)}$$

$$\text{future value} = \text{amount} \times \left(1 + \frac{\text{days}}{\text{days in period}} \times y\right)$$

Multiple periods, not matching whole periods

$$\text{present value} = \frac{\text{amount}}{(1 + y)^{\frac{\text{days}}{\text{days in period}}}}$$

$$\text{future value} = \text{amount} \times (1 + y)^{\frac{\text{days}}{\text{days in period}}}$$

Annuities

$$\text{present value} = \text{payment} \times \frac{1-(1+y)^{-n}}{y}$$

$$\text{future value} = \text{payment} \times \frac{(1+y)^{n}-1}{y}$$

Growth annuities

$$\text{present value} = \frac{\text{payment}}{g-y} \times \left[\frac{(1+g)^{n+1}}{(1+y)^{n}} - 1 - g \right]$$

$$\text{future value} = \frac{\text{amount}}{g-y}\left[(1+g)\left((1+g)^{n}-(1+y)^{n}\right)\right]$$

Growth annuity where y=g

$$\text{present value} = \text{payment} \times n$$

$$\text{future value} = \text{payment} \times n \times (1+y)^{n}$$

Perpetual annuity

$$\text{present value} = \frac{\text{payment}}{y}$$

Growth perpetual annuity

$$\text{present value} = \frac{\text{amount}}{y-g} \qquad y>g$$

Amortising loan

$$\text{payment} = \text{loan value} \times \frac{y}{1-(1+y)^{-n}}$$

Sinking fund

$$\text{payment} = \text{future value} \times \frac{y}{(1+y)^n - 1}$$

Embedded interest rates in an amortising loan structure

$$\text{payment} \times \frac{1-(1+y)^{-n}}{y} - \text{principal} = 0$$

Rate & period conversions

$$\text{decimal rate} = \frac{\text{percentage rate}}{100}$$

$$\text{percentage rate} = \text{decimal rate} \times 100$$

$$\text{number of periods} = \text{periods per year} \times \text{number of years}$$

$$\text{rate per period} = \frac{\text{no minal annual rate}}{\text{periods per year}}$$

$$\text{annual payment} = \text{periods per year} \times \text{payment}$$

$$\text{annual rate} = \text{periods per year} \times \text{rate per period}$$

$$\text{effective annual rate} = \left(1 + \frac{\text{no minal annual rate}}{\text{num periods per year}}\right)^{\text{num periods per year}} - 1$$

$$\text{no minal annual rate} = \left(1 + \text{effective annual rate}\right)^{\left(\frac{1}{\text{num perionds per year}}\right)} - 1$$

$$\text{continuously compounding rate} = \ln\left(1 + \text{effective annual rate}\right)$$

Different compounding & payment frequencies

$$\text{number of periods} = \text{compounding periods per year} \times \text{number of years}$$

$$\text{interest rate} = \frac{\text{nominal annual interest rate}}{\text{compounding periods per year}}$$

$$\text{effective payment} = \text{actual payment} \times \frac{\text{payment periods per year}}{\text{compounding periods per year}}$$

$$\text{actual payment} = \text{effective payment} \times \frac{\text{compounding periods per year}}{\text{payment periods per year}}$$

Valuation multiples

$$\text{value} = \text{amount} \times \text{multiple}$$

$$\text{multiple} = \frac{\text{sale value}}{\text{amount}}$$

$$\text{multiple} = \frac{100}{\text{yield}}$$

$$\text{yield} = \frac{100}{\text{multiple}}$$

Orthogonal selection

combinations = the number of options for each parameter,
multiplied together

Sensitivities

$$\text{output change} = \text{sensitivity multiple} \times \text{input change}$$

$$\text{change} = \frac{\text{new value} - \text{old value}}{\text{old value}} \times 100$$

$$\text{actual change} = \text{original amount} \times \frac{\text{percentage change}}{100}$$

Regression sensitivity

$$\text{output value} = a \times \text{input value} + b$$

$$\text{dollar change in output} = a \times \text{dollar change in input}$$

$$\text{sensitivity multiple} = a \times \frac{\text{input value}}{\text{output value}}$$

Time sensitivities

$$\text{time sencitivity} = \frac{\text{expenses}}{\text{income} - \text{expenses}}$$

$$\text{net profit percentage change} = \text{time sensitivity} \times \text{time percentage change}$$

Type	Value Affected	Formula	Description
Operational sensitivity (operational leverage)	Gross cash flow	$\frac{\text{income}}{\text{income - expenses}}$	The multiple of change in cash flow to change in either income or expenses
Asset sensitivity (financial leverage)	Equity (Net assets)	$\frac{\text{assets}}{\text{assets - debts}}$	The multiple of the change in equity to the change in asset values
Interest rate sensitivity	Net cash flow	$\frac{\text{interest expense}}{\text{net profit}}$	The multiple of change in net profit, to change in interest expense. A change in interest rates from 5% to 6% would lead to 20% rise in the interest expense
Input price sensitivity	Gross cash flow	$\frac{\text{cost price per unit}}{\text{}}$	The multiple of the change in total cost per unit, to the change

Production Sensitivity (production leverage)	Net Profit	$\frac{\text{units x (unit sale price – unit variable cost)}}{\text{units x (sale price – unit variable cost) – fixed costs}}$	in the price of a raw material The multiple of percentage change in net profit to the percentage change in production volumes.
Time Sensitivity	Net Profit	$\frac{\text{expenses}}{\text{income - expenses}}$	The multiple of the percentage change in net profit, compared to a percentage change in time periods, where income is fixed and expenses are time-dependant.

Miscellaneous

Averages

$$\text{average} = \frac{\text{sum of the individual items}}{\text{number of items}}$$

$$\text{total} = \text{average} \times \text{number of items}$$

$$\text{weighted average} = \frac{\sum x_i \times w_i}{\sum w_i}$$

Capital Asset Pricing Model

$$r_s = \beta(r_m - r_f) - r_f$$

Weighted Average Cost of Capital

$$\text{weighted average cost of capital} = \frac{\text{debt} \times \text{cost of debt} + \text{equity} \times \text{cost of equity}}{\text{debt} + \text{equity}}$$

Negative Cash Flow

$$\text{months remaining} = \frac{\text{available capital}}{\text{net monthly outflow}}$$

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