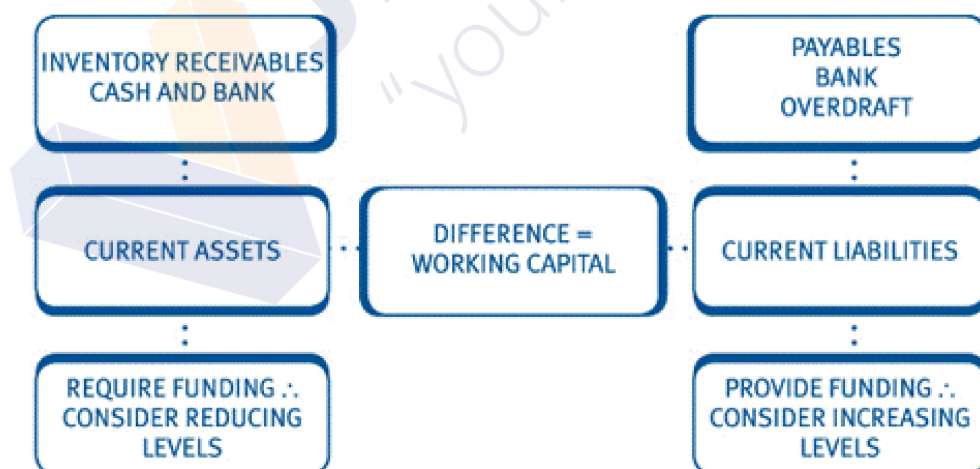


Working Capital Management

An introduction to working capital



An introduction to working capital

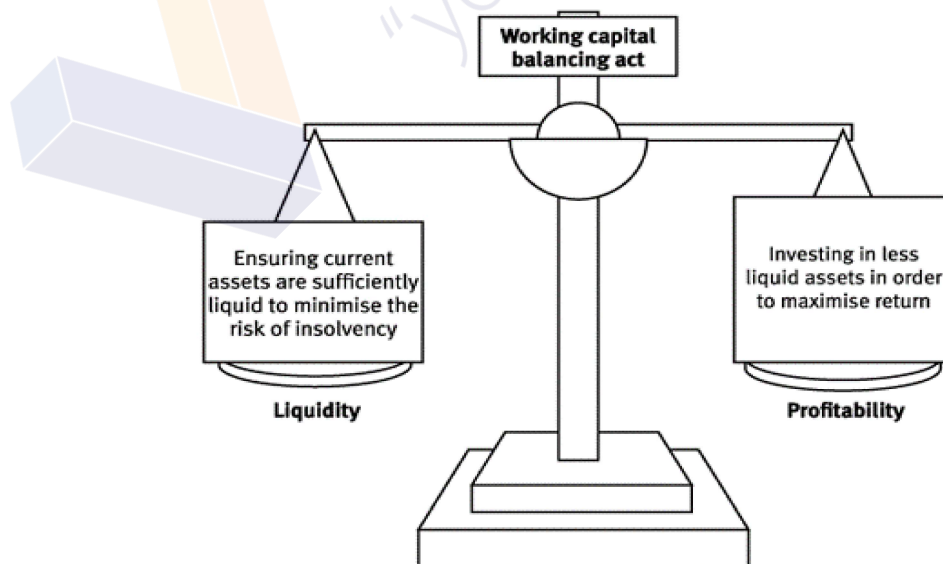
The amount tied up in **working capital** is equal to the value of raw materials, work in progress, finished goods inventories and accounts receivable less accounts payable. The size of this net figure has a direct effect on the **liquidity** of an organization.

The two main objectives of working capital management are to ensure it has **sufficient liquid resources** to continue in business and to **increase its profitability**.

A business needs to have **clear policies** for the management of each component of working capital.

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Objective of working capital management



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Objectives of Working Capital Management

- Every business needs **adequate liquid resources** to maintain day-to-day activities. It needs enough to pay wages, salaries, accounts payable and repayment of loan installment as to keep its workforce, supplies and financial institutions satisfied.
- Proper working capital management make sure the long term **sustainability** of the entity.

On the other hand, an **excessively** conservative approach to working capital management resulting in **high levels of cash holdings** will harm profits because the opportunity to make a return on the assets tied up as cash will have been missed.

These two objectives will often **conflict** as liquid assets give the lowest returns.

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Role of Working Capital Management

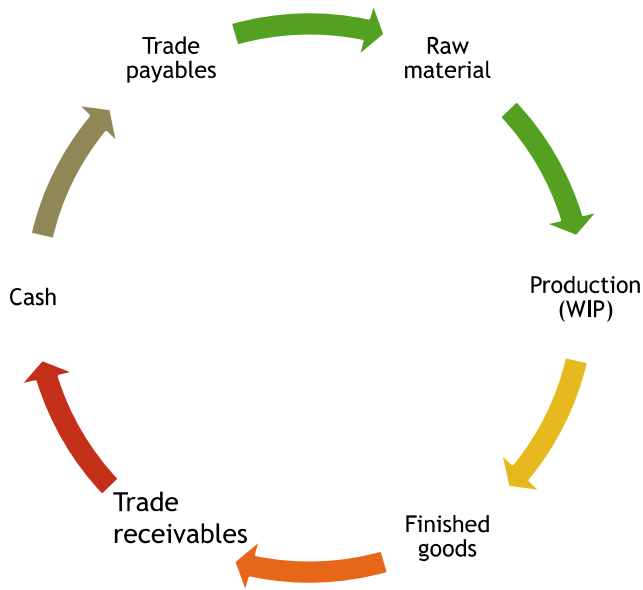
Working capital management is a key factor in an organization's long-term success. A business must therefore have clear policies for the management of each component of working capital (current assets and current liabilities).

The management of ***cash, Inventory marketable securities, accounts receivable, accounts payable, accruals and other means of short-term financing***

is the **direct** responsibility of the financial manager and it requires continuous day-to-day supervision.

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Cash Operating Cycle

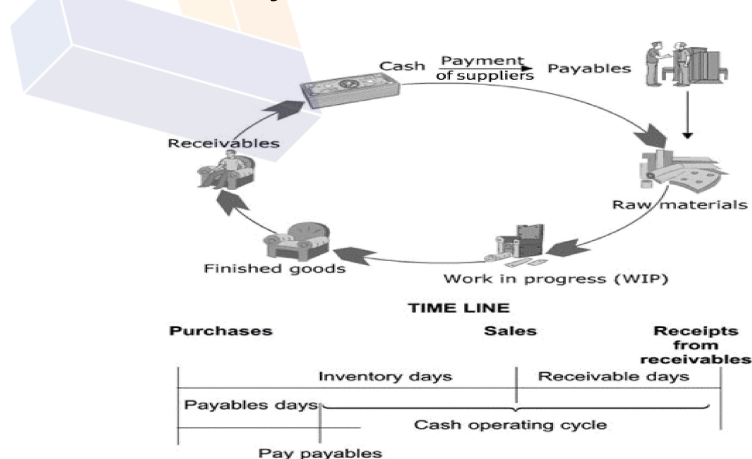


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The Cash Operating Cycle

The cash operating cycle is the length of time between the company's outlay on raw materials, wages and other expenditures and the inflow of cash from the sale of goods.

The faster a firm can 'push' items around the cycle the lower its investment in working capital will be. This also called the **working capital cycle** or **trading cycle** or **cash conversion cycle**.



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The Cash Operating Cycle

Industry	Manufacturing	Trading
	Days	Days
Raw Material Holding Period	xx	N/A
WIP Holding Period	xx	N/A
Finished Goods Holding Period	xx	xx
Receivables Holding Period	xx	xx
	xxx	xxx
(-) Payables Holding Period	(xx)	(xx)
Cash Operating Cycle	xxx	xxx

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Working capital needs of different types of business

Different industries have different optimum working capital profiles, reflecting their methods of doing business and what they are selling.

Length of the cycle depends on:

- Liquidity versus profitability decisions
- Terms of trade
- Management efficiency
- Industry norms, e.g. retail versus construction. Manufacturing Vs Financial institutions, Seasonal Businesses and etc.

The optimum level of working capital is the amount that results in no idle cash or unused inventory, but that does not put a strain on liquid resources.

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Factors affecting to level of working capital

Internal factors

- ▶ Business size and growth rate
- ▶ Organization structure
- ▶ Knowledge about working capital management
- ▶ Ability to borrowing and investing

External factors

- ▶ Bank services
- ▶ Interest rates
- ▶ New technology and financial instruments
- ▶ Competition

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Over capitalization and working capital

What is overcapitalization?

- ▶ If there are excessive inventories, accounts receivable and cash, and very few accounts payable, there will be an over-investment by the company in current assets.
- ▶ Working capital will be excessive and the company will be, in this respect, overcapitalized.

How it is indicated?

- ▶ Poor turnover (inventory / receivables) ratios in comparison to past records, industry norms.
- ▶ Poor liquidity ratios in comparison to past records, industry norms.
- ▶ Poor sales and higher amount of working capital in comparison to past records, industry norms.

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Overtrading

- ▶ In contrast with overcapitalization, overtrading happens when a business tries to **do too much too quickly** with **too little long-term capital**, so that it is trying to support too large a volume of trade with the capital resources at its disposal.
- ▶ Even if an overtrading business operates at a profit, it could easily run into serious trouble because it is **short of money**. Such liquidity troubles stem from the fact that it does not have enough capital to provide the cash to pay its debts as they fall due.

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Symptoms of overtrading

- ▶ Rapid increase in sales revenue
- ▶ Rapid increase in the volume of current assets and possibly also non-current assets. Inventory turnover and accounts receivable turnover might slow down. Rate of increase in inventories and accounts receivable would be even greater than the rate of increase in sales.
- ▶ Small increase in proprietors' capital (perhaps through retained profits). Most of the increase in assets is financed by credit, especially:
 - (i) Trade accounts payable – the payment period to accounts payable is likely to lengthen
 - (ii) A bank overdraft, which often reaches or even exceeds the limit of the facilities agreed by the bank
- ▶ Some debt ratios and liquidity ratios alter dramatically.
 - (i) The proportion of total assets financed by proprietors' capital falls, and the proportion financed by credit rises.
 - (ii) The current ratio and the quick ratio fall.
 - (iii) The business might have a liquid deficit, that is, an excess of current liabilities over current assets.

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How to come out from overtrading?

- ▶ Injecting new capital by the shareholders.
- ▶ Better control could be applied to inventories and accounts receivable.
- ▶ Abandon ambitious plans for increasing sales and more noncurrent asset purchases until the business has had time to consolidate its position, and build up its capital base with retained profits.
- ▶ A business seeking to increase its revenue too rapidly without an adequate capital base is not the only cause of overtrading. Other causes are as follows.
 - (a) When a business repays a loan, it often replaces the old loan with a new one (refinancing). However, a business might repay a loan without replacing it, with the consequence that it has less long-term capital to finance its current level of operations.
 - (b) A business might be profitable, but in a period of **inflation**, its retained profits might be insufficient to pay for replacement non-current assets and inventories, which now cost more because of inflation.

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Conservative working capital management

- ▶ A conservative working capital management policy aims to reduce the risk of system breakdown by holding high levels of working capital. Generally **risk averse** decision makers adopt this approach.
- ▶ Customers are allowed generous payment terms to stimulate demand, finished goods inventories are high to ensure availability for customers, and raw materials and work in progress are high to minimize the risk of running out of inventory and consequent downtime in the manufacturing process. Suppliers are paid promptly to ensure their goodwill, again to minimize the chance of stock-outs.
- ▶ However, the cumulative effect of these policies can be that the firm carries a high burden of unproductive assets, resulting in a financing cost that can destroy profitability. A period of rapid expansion may also cause severe cash flow problems as working capital requirements outstrip available finance. Further problems may arise from inventory obsolescence and lack of flexibility to customer demands.

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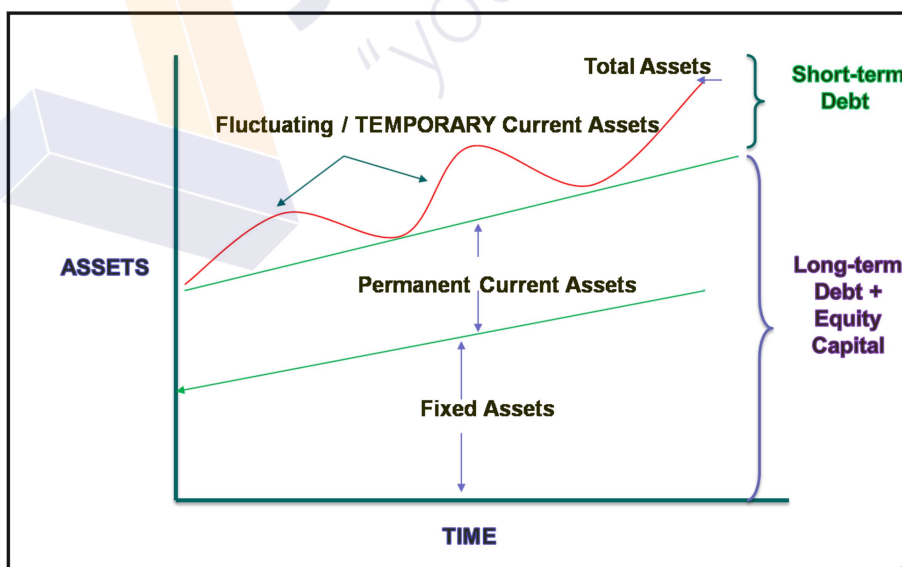
Aggressive working capital management

- ▶ An aggressive working capital investment policy aims to reduce this financing cost and increase profitability by cutting inventories, speeding up collections from customers and delaying payments to suppliers. Generally **risk followers / lovers** decision makers adopts this approach.
- ▶ The potential disadvantage of this policy is an increase in the chances of system breakdown through running out of inventory or loss of goodwill with customers and suppliers.
- ▶ However, modern manufacturing techniques encourage inventory and work in progress reductions through just-in-time policies, flexible production facilities and improved quality management. Improved customer satisfaction through quality and effective response to customer demand can also mean that credit periods are shortened.

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Working capital financing

- ▶ There are different ways in which the funding of the current and non-current assets of a business can be achieved by employing long- and short-term sources of funding.



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Working capital financing

- Financing almost all current assets using long term capital can be known as a **conservative approach** to financing working capital. Accordingly all non-current assets and permanent current assets, as well as part of the fluctuating current assets, are financed by long-term funding.
- Financing almost all non-current assets using short term capital can be known as more **aggressive approach** to financing working capital. Not only are fluctuating current assets all financed out of short-term sources, but so are some of the permanent current assets. This policy represents an increased risk of liquidity and cash flow problems, although potential returns will be increased if short-term financing can be obtained more cheaply than long-term finance. It enables greater flexibility in financing.
- A balance between risk and return might be best achieved by the **moderate approach** whereby a policy of maturity matching in which long-term funds finance permanent assets while short-term funds finance nonpermanent assets.

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Cash management options

- ▶ Cash management allows business to meet day to day expenses, but reduce the cash holding cost. Holding cash has a cost. That is the loss of earnings which would otherwise have been obtained by using the funds in another way.
- ▶ **Optimal cash** holding levels can be calculated from formal models, such as the **Baumol model** and the **Miller-Orr model**.
- ▶ The **yield** (profitability) of an investment depends on:
 - Its face value
 - The interest rate offered
 - The period of time before it is redeemed (ie converted into cash) by the issuer

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Managing Cash

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How to arise cash flow problems

- ▶ **Continuance losses** - If a company makes continuance losses, it will eventually have cash flow problems.
- ▶ **Inflation** - In a period, of inflation the entity has to pay increased amount of cash in comparison to the amount paid earlier for the same activity.
- ▶ **Rapid growth** - The entity has to have more cash during the growing period as to meet the requirement of the expanded operation. Ex. Purchase of machinery
- ▶ **Seasonal sales** - When the entity has seasonal sales they have to face the cash difficulties until the season comes.
- ▶ **One-off expenditure** - A single non-recurring item of expenditure may create a cash flow problem. Examples include the repayment of loan capital on maturity of the debt or the purchase of an exceptionally expensive item, such as a freehold property.

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Methods of easing cash flow shortages

- ▶ Postponing capital expenditure.
- ▶ Implementing a system to encourage the debtors to pay early.
- ▶ Sale of less critical assets only if the cash shortage is severe.
- ▶ Negotiate to extend the payment terms.
- ▶ Obtaining bank overdraft facility.
- ▶ Obtaining a short-term bank loan.
- ▶ Reschedule existing loan facility easing the installment payments.
- ▶ Since the dividend is discretionary cash outflow, it can be reduced.

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The Baumol Model

The Baumol model uses an equation of the same form as the economic order quantity (EOQ) formula for inventory management which we look at later.

Costs are minimised when:

$$Q = \sqrt{\frac{2CS}{i}}$$

- Where
- S = the amount of cash to be used in each time period
 - C = the cost per sale of securities
 - i = the interest cost of holding cash or near cash equivalents
 - Q = the total amount to be raised to provide for S

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Drawbacks of baumol model

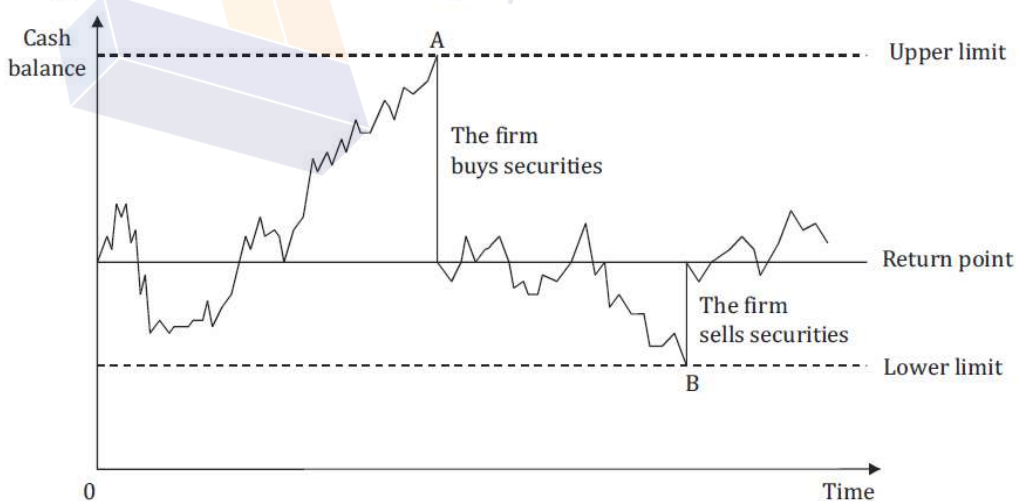
The inventory approach illustrated above has the following drawbacks.

- (a) In reality, it is unlikely to be **possible** to **predict amounts required** over future periods with much certainty.
- (b) No **buffer inventory** of cash is allowed for. There may be costs associated with running out of cash.
- (c) There may be other **normal costs** of holding cash which increase with the average amount held.

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The Miller-orr Model

If the cash balance reaches an **upper limit** (point A) the firm **buys sufficient securities** to return the cash balance to a normal level (called the 'return point'). When the cash balance reaches a lower limit (point B), the firm **sells securities** to bring the balance back to the return point.



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The Miller-orr Model

FORMULA TO LEARN

Return point = lower limit + $\left(\frac{1}{3} \times \text{spread}\right)$

The formula for the spread is:

$$\text{Spread} = 3 \left(\frac{3}{4} \times \frac{\text{transaction cost} \times \text{variance of cash flows}}{\text{interest rate}} \right)^{\frac{1}{3}}$$

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Investing Surplus Cash

Companies and other organizations sometimes have a **surplus of cash** and become 'cash rich'. A cash surplus is likely to be **temporary**, but while it exists the company should invest or deposit the cash bearing the following considerations in mind.

- ▶ **Liquidity.** Money should be available to take advantage of favorable short-term interest rates on bank deposits, or to grasp a strategic opportunity, for example paying cash to take over another company.
- ▶ **Profitability.** The company should seek to obtain a **good return** for the **risk** incurred.
- ▶ **Safety.** The company should **avoid** the risk of a **capital loss**.

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Investing Surplus Cash

Other factors that organizations need to consider include:

- ▶ Whether to invest at **fixed or floating rates**. Floating rate investments are likely to be chosen if interest rates are expected to rise.
- ▶ **Term to maturity**. The terms chosen will be affected by the business's desire for **liquidity** and **expectations** about future rates of interest; if there are major uncertainties about future interest rate levels it will be better to choose short-term investments. There may also be **penalties** for **early liquidation**.
- ▶ How easy it will be to **realize** the investment.
- ▶ Whether a **minimum amount** has to be invested in certain investments.
- ▶ Whether to invest on **international markets**.
- ▶ If a company has no plans to grow or to invest, then surplus cash not required for transactions or precautionary purposes should normally be **returned to shareholders**.

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Short-term Investments

Temporary cash surpluses are likely to be:

- ▶ **Deposited** with a **bank** or similar financial institution.
- ▶ Invested in **short-term debt instruments** (debt instruments are debt securities which can be traded).
- ▶ Invested in **longer-term debt instruments**, which can be sold on the stock market when the company eventually needs the cash.
- ▶ Invested in **shares of listed companies**, which can be sold on the stock market when the company eventually needs the cash.

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Effective Annual Interest Rates

The effective interest rate is the rate on an investment that has been restated from the nominal interest rate to one with annual compound interest. It is used to make loans more comparable by converting individual loans' interest rates into equivalent annual rates.

It is calculated using the following formula.

$$r = (1 + i/n)^n - 1$$

where: r is the effective interest rate

i is the nominal interest rate

n is the number of compounding periods per year (eg 12 for monthly compounding)

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Interest yield

Yield refers to the earnings from an investment over a specific period. It includes the investor earning such as interest and dividends received by holding particular investments. Yield is also the annual profit that an investor receives for an investment.

Interest yield (flat yield / running yield) is the interest or coupon rate expressed as a % of the market price.

$$\text{Interest yield} = \frac{\text{Gross interest}}{\text{Market price}} \times 100\%$$

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Interest yield

The interest yield in practice is influenced by two other factors.

► Accrued interest

The interest on 10% Stock 20X3 is paid in two equal instalments on 8 March and 8 September each year. Thus, if an investor were to sell their stock on 1 June 20X0, in the absence of any other rules they would be forgoing a considerable amount of interest which will be received on 8 September 20X0 by the purchaser. The price paid by the purchaser must reflect this amount of accrued interest.

► Cum int and ex int

For administrative reasons, issuers of securities (eg the government) must close their books some time before the due date for the payment of interest, so that they can prepare and send out the necessary documentation in time for it to reach the registered owners of securities before the due dates. Any person who buys stocks **ex int** will not receive the next interest payment. This will be sent to the former owner.

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Redemption Yields

- **Redemption yield** is the rate of interest at which the total of the discounted values of any future payments of interest and capital is equal to the current price of a security.
- The interest yield takes no account of the fact that most government stocks are redeemable (ie that their face value will be repaid), nor of the proximity of the redemption date, although we have seen how the pull to maturity can affect the price. A more realistic measure of the overall return available from a stock is the **gross redemption yield**. This takes account of both the **interest payable until redemption** and the **redemption value**.
- Redemption yield is the IRR of the stock which could be calculated using YTM too.
- Yield are determined by the market prices which in turn reflect the demand for particular stocks. Higher the yield means, lower the market price and it is unpopular. Lower the yield means, relatively high market price and popular.

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Managing Receivables

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Managing receivables

- ▶ The **benefits** of action to collect debts must be greater than the **costs** incurred.
- ▶ **Early settlement discounts** may be employed to shorten average credit periods and to reduce the investment in accounts receivable and therefore **interest costs**.
- ▶ The benefit in interest cost saved should exceed the cost of the discounts allowed.
- ▶ Some companies use **factoring** and **invoice discounting** to help short-term liquidity or to reduce administration costs. **Insurance**, particularly of overseas debts, can also help reduce the risk of bad debts.

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Strategies for managing receivables

- ▶ Extending the credit period
- ▶ Offering discount in early settlement
- ▶ Factoring
- ▶ Invoice discounting
- ▶ Credit insurance

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Extending the credit period

To determine whether it would be profitable to extend the level of total credit, it is necessary to assess:

- ▶ The **extra sales** that a **more generous credit policy** would stimulate
- ▶ The **profitability** of the **extra sales**
- ▶ The **extra length** of the **average debt collection period**
- ▶ The **required rate of return** on the investment in additional accounts receivable

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Factoring

A **factor** is defined as 'a doer or transactor of business for another', but a factoring organization specializes in trade debts and manages the debts owed to a client (a business customer) on the client's behalf. **Factoring** is an arrangement to have debts collected by a factor company, which advances a proportion of the money it is due to collect.

The main aspects of factoring include the following.

- ▶ **Administration** of the client's invoicing, sales accounting and debt collection service.
- ▶ **Credit protection** for the client's debts, whereby the factor takes over the risk of loss from bad debts and so 'insures' the client against such losses. This is known as a **non-recourse** service. However, if a **non-recourse** service is provided the factor, not the firm, will decide what action to take against non-payers.
- ▶ Making **payments** to the client **in advance** of collecting the debts. (This is sometimes referred to as 'factor finance' because the factor is providing cash to the client against outstanding debts.)

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Benefits of factoring

The **benefits of factoring** for a business customer include the following.

- ▶ The business can **pay** its **suppliers promptly** and so be able to take advantage of any early payment discounts that are available.
- ▶ **Optimum inventory levels** can be **maintained**, because the business will have enough cash to pay for the inventories it needs.
- ▶ **Growth** can be **financed** through **sales** rather than by injecting fresh external capital.
- ▶ The business gets **finance linked** to its **volume of sales**. In contrast, overdraft limits tend to be determined by historical statements of financial position.
- ▶ The **managers** of the business **do not** have to **spend** their **time** on the problems of **slow paying accounts receivable**.
- ▶ The business does **not incur** the **costs** of **running** its own **sales ledger department** and can use the **expertise** of debtor management that the factor has.

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Invoice discounting

Invoice discounting is the purchase (by the provider of the discounting service) of trade debts at a discount. Invoice discounting enables the company from which the debts are purchased to raise working capital.

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Managing Stocks

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Inventory cost

Holding cost	The cost of capital Warehousing and handling cost Deterioration Obsolescences Insurance Pilferage (stealing)
Purchasing cost	Ordering cost Delivery cost
Shortage cost	Contribution from lost sales Extra cost on emergency inventory Cost on lost of production and sales in a stock-out
Cost of inventory	Relevant particularly when calculating discounts

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Economic order quantity

- ▶ EOQ is, the **order quantity** that minimizes the total inventory holding costs and **ordering** costs. It is one of the oldest classical production scheduling models. The framework used to determine this **order quantity** is also known as Wilson **EOQ** Model, Wilson Formula or Andler Formula.
- ▶ Bulk discounts can not be incorporated in EOQ formula.

$$EOQ = \sqrt{\frac{2 \times D \times C_o}{C_h}}$$

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Inventory levels

Reorder Level is, at what level next order should be placed. $RL = \text{Maximum Usage} \times \text{Maximum Lead time}$	Maximum Level is, at the warning level to signal to management that inventory is reaching potentially wasteful level. $ML = \text{Reorder level} + \text{Reorder Qty} - (\text{Minimum Usage} \times \text{Minimum Lead time}).$
Minimum Level is, at the warning level to signal to management that inventory is reaching dangerously lower level. $\text{Mini. L} = \text{Reorder level} - (\text{Average Usage} \times \text{Average Lead time}).$	Average stock level Shows, the moderate level of stock held by a firm. The average stock level can be calculated with the help of following formula. $\text{Average Stock Level} = \text{Minimum Level} + (1/2 \text{ Re-order Quantity})$

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Just-in-time (JIT) Procurement

Some manufacturing companies have sought to reduce their inventories of raw materials and components to as low a level as possible. **Just-in-time procurement** is a term which describes a policy of obtaining goods from suppliers at the latest possible time (ie when they are needed) and so avoiding the need to carry any materials or components inventory.

- ▶ Introducing JIT might bring the following potential benefits.
 1. Reduction in inventory holding costs
 2. Reduced manufacturing lead times
 3. Improved labour productivity
 4. Reduced scrap/rework/warranty costs

- ▶ Reduced inventory levels mean that a lower level of investment in working capital will be required.

- ▶ JIT will not be appropriate in some cases. For example, a restaurant might find it preferable to use the traditional EOQ approach for staple non-perishable food inventories but adopt JIT for perishable and 'exotic' items. In a hospital, a stockout could quite literally be fatal and so JIT would be quite unsuitable.

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Managing Payables

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Managing Payables

Effective management of **payables** involves seeking satisfactory credit terms from suppliers, getting credit extended during periods of cash shortage and maintaining good relations with suppliers.

► Management of payables

The management of trade accounts payable involves:

- Attempting to obtain **satisfactory credit** from suppliers
 - Attempting to **extend credit** during periods of cash shortage
 - Maintaining **good relations** with regular and important suppliers
- If a supplier offers a discount for the early payment of debts, the evaluation of the decision whether or not to **accept the discount** is similar to the **evaluation of the decision** whether or not to **offer a discount**. One problem is the mirror image of the other. The methods of evaluating the offer of a discount to customers were described earlier.

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