

F9 Course notes



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Introduction

This paper is all about helping you to become a FINANCE MANAGER of a business.

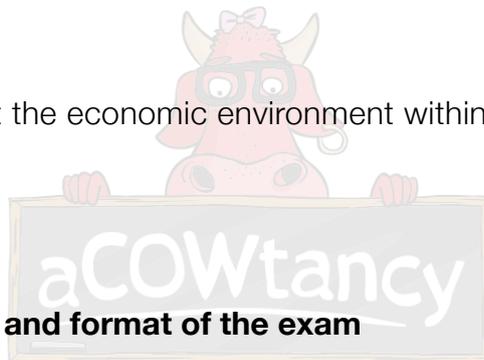
This means you are responsible for 3 key decisions:

Investment

Financing

Dividends

The paper also looks at the economic environment within which these decisions are made



Assessment methods and format of the exam

This paper is divided into two sections:

Section A – ALL 20 questions (multiple choice) are compulsory and MUST be attempted

Section B – ALL FIVE questions are compulsory and MUST be attempted

Formulae Sheet, Present Value and Annuity Tables are provided

Syllabus A: FINANCIAL MANAGEMENT FUNCTION

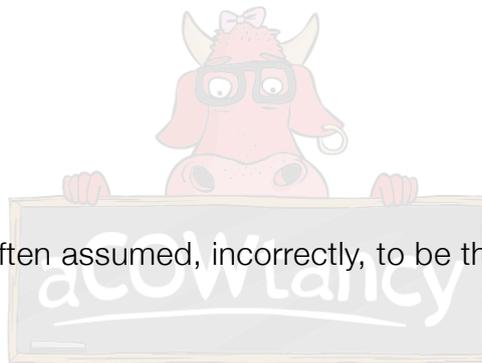
A1: The nature and purpose of financial management

Syllabus A1a: Explain the nature and purpose of financial management.

Financial management is getting and using financial resources well to meet objectives

Financial objectives

Profit maximisation is often assumed, incorrectly, to be the main objective of a business.



Reasons why profit is not a sufficient objective:

1. Investors care about the future
2. Investors care about the dividend
3. Investors care about financing plans
4. Investors care about risk management

For a profit-making company, a better objective is the maximisation of shareholder wealth;

this can be measured as total shareholder return (the dividend per share plus capital gain divided by initial share price)

Key decisions:

Investment

(in projects or takeovers or working capital) need to be analysed to ensure that they are beneficial to the investor.

Investments can help a firm maintain strong future cash flows by the achievement of key corporate objectives

e.g. market share, quality.

Finance

mainly focus on how much debt a firm is planning to use.

The level of gearing that is appropriate for a business depends on a number of practical issues:

Life cycle - A new, growing business will find it difficult to forecast cash flows with any certainty so high levels of gearing are unwise.

Operating gearing- If fixed costs are a high proportion of total costs then cash flows will be volatile; so high gearing is not sensible.

Stability of revenue- If operating in a highly dynamic business environment then high gearing is not sensible.

Security- If unable to offer security then debt will be difficult and expensive to obtain.

Dividends

how returns should be given to shareholders

Risk management

mainly involve management of exchange rate and interest rate risk and project management issues.

Key Objectives of Financial Management

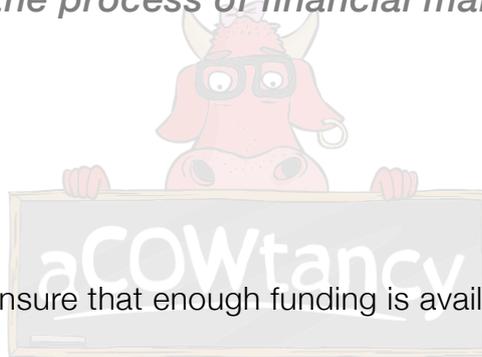
Taking a commercial business as the most common organisational structure, the key objectives of financial management would be to:

1. Create wealth for the business
2. Generate cash, and
3. Provide an adequate return on investment bearing in mind the risks that the business is taking and the resources invested

3 key elements to the process of financial management

Financial Planning

Management need to ensure that enough funding is available at the right time to meet the needs of the business.



In the short term, funding may be needed to invest in equipment and stocks, pay employees and fund sales made on credit.

In the medium and long term, funding may be required for significant additions to the productive capacity of the business or to make acquisitions.

Financial Control

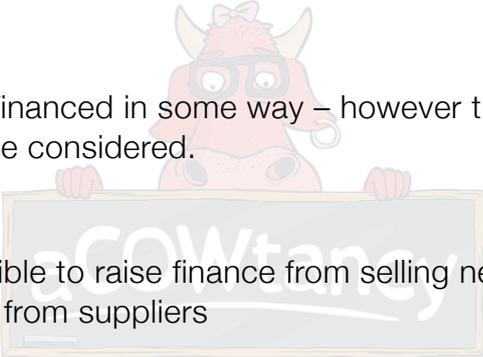
Financial control is a critically important activity to help the business ensure that the business is meeting its objectives.

Financial control addresses questions such as:

- Are assets being used efficiently?
- Are the businesses assets secure?
- Do management act in the best interest of shareholders and in accordance with business rules?

Financial Decision-making

The key aspects of financial decision-making relate to investment, financing and dividends:

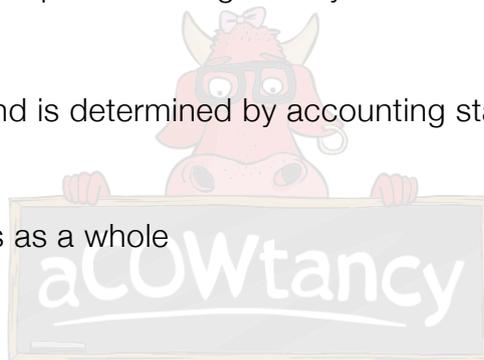
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- Investments must be financed in some way – however there are always financing alternatives that can be considered.
 - For example it is possible to raise finance from selling new shares, borrowing from banks or taking credit from suppliers
 - A key financing decision is whether profits earned by the business should be retained rather than distributed to shareholders via dividends.
 - If dividends are too high, the business may be starved of funding to reinvest in growing revenues and profits further

Financial Management

Looks at long term raising of finance and the control of resources.

Financial accounting

- Gives information about past events generally.
- It is required legally and is determined by accounting standards.
- Looks at the business as a whole



Management accounting

- Provides information for day to day decisions generally, to aid management.
- No strict rules or format
- Can focus on specific areas of business

A2: Financial objectives and the relationship with corporate strategy

Syllabus A2a: Discuss the relationship between financial objectives, corporate objectives and corporate strategy.

Corporate Objectives

These are wider than purely financial ones, they look at the business as a whole

Examples include:

- Return on investment
- Market share
- Growth
- Customer satisfaction
- Quality



Once these are set appropriate financial objectives can then be set and measured

Corporate strategy is the overriding plan of the company - e.g.. To become the best known brand

This then feeds down to corporate objectives such as the ones we saw earlier e.g.. Market share, quality etc

To help us ensure these corporate objectives are met then financial objectives are created to give the company something to measure and help control the corporate objectives progress e.g. See below

Syllabus A2b: Identify and describe a variety of financial objectives, including:

- i) shareholder wealth maximisation*
 - ii) profit maximisation*
 - iii) earnings per share growth*
-

Shareholder wealth maximisation (share price)

Maximisation of shareholder wealth is measured by the share price (if the company is listed of course).

This is because the share price is theoretically the value of all future dividends coming to the shareholders.

However, sometimes a business reports a profit increase and the share price falls due to the manner in which they made the profit.

This suggests that that profit is not sufficient as a business objective

Share price could also rise and fall due to potential investment decisions or the fact that a new loan is being taken out or that dividends are to be increased or lowered

Profit Maximisation

Focusing on profits could mean undue risk and short termism.

Also there is the problem that profits can be manipulated using financial accounting, unlike cash.

So maybe profit maximisation focuses on financial profit too much and not enough on cash generation.

Let's now have a quick look at Earnings Per Share (EPS)

Earnings Per Share¹

This uses earnings (profits) rather than cash. It shows the amount of profits for each ordinary share made in the year.

It is calculated as follows:

Profit after tax - preference dividends

Weighted average Ordinary shares

Illustration

	Last year	Current year
Profits before interest and tax	22,300	23,726
Interest	3,000	3,000
Tax	5,790	6,218
Profits after tax	13,510	14,508
Preference dividends	200	200
Dividends	7,986	8,585
Retained earnings	5,324	5,723
No ordinary shares issued	100,000	100,000

What is the EPS in each year?

Last year: Earnings (13,510 - 200) 13,310

Shares 100,000

EPS = 13.31p (Current year EPS = 14.31p)

¹ PP Q1c

A3: Stakeholders and impact on corporate objectives

Syllabus A3a: Identify the range of stakeholders and their objectives

We have just seen that the primary objective of a company is the maximisation of shareholder wealth.

However, there is an alternative known as the **stakeholder view**.

This means balancing shareholder wealth with the objectives of other stakeholders.

Range	Objective
INTERNAL	
Staff	High salaries; safe job
Managers	High bonuses
EXTERNAL	
Shareholders	High share price; dividend growth
Banks	Minimise company risk
Customer	Quality service
Suppliers	Good liquidity
Government	Good accounting records; Training initiatives

Syllabus A3b: Discuss the possible conflict between stakeholder objectives

Everybody wants different things - and that's a problem the company has to try and solve

For example, customers want great quality but a cheap price, unions and employees want high wages and lots of holidays, suppliers want paying asap - and all of these work against the shareholders profits to an extent

Syllabus A3c: Discuss the role of management in meeting stakeholder objectives, including the application of agency theory

Clearly meeting all stakeholders objectives entirely is impossible. Often they are in conflict with each other.

Therefore a degree of compromise is reached.

For example, Performance related pay for example is a means of satisfying both staff and shareholders.

There is a fundamental problem highlighted here.

The owners of the business are generally not those who manage the business.

As both parties have different objectives this causes a problem.

The danger that managers may not act in the best interest of the owners is known as

The Agency Problem

The managers are acting as **agents** for the owners.

Syllabus A3d: Describe and apply ways of measuring achievement of corporate objectives including:

- i) ratio analysis, using appropriate ratios such as return on capital employed, return on equity, earnings per share and dividend per share
 - ii) changes in dividends and share prices as part of total shareholder return
-

Return on Capital Employed (Accounting rate of return)²

Operating profit (pbit)

Capital Employed

Capital employed can be calculated in 2 ways:

- TALCL (Total assets less current liabilities)
- Equity + LTL (Long term liabilities)

ROCE indicates the profitability of a company

ROCE should always be higher than the rate at which the company borrows, so that return (on capital) is higher than what we pay (interest on capital)

Think of it this way - we borrow 1,000 at 10% to buy an asset. The asset makes a PBIT of 200. Is this a good ROCE?

Yes because it makes a 20% ($200 / 1000$) ROCE when the cost of borrowing is only 10%

² PP Q4b

Return on Equity = $\frac{\text{PAT} - \text{Preference dividends}}{\text{Ordinary shares} + \text{reserves}}$

Ordinary shares + reserves

Return on Equity describes how well contributions from shareholders generated earnings for the company.

Importance of Return on Equity:

A company wants to maximise its use of shareholder's equity, as it is the shareholders the company must answer to on how they spent the shareholder's money. Return on Equity basically shows how many dollars of earnings were generated per dollar of equity the shareholder's provided.

Service Industries have good ROCE/ROE

It is worth noting that not all high-ROE/ROCE companies make good investments. Some industries require no assets, such as consulting firms and the Richard Clarke Academy! We have high ROCE - but I'm still not rich :(

Other industries require huge asset bases before making a profit such as manufacturing. Therefore their ROCE won't be as high as ours (as a percentage)

Highly geared companies have good ROE

ROE will increase as companies increase gearing. ie They finance the business more through loans than shareholders funds. This means that return should increase, but the shareholders funds will not (loans will instead), therefore driving the ROE up.

Hence the ROE and ROCE will be very high for service industries generally and not so for manufacturing.

Therefore ROCE/ROE are best used to compare companies **in the same industry and with similar gearing**

Illustration

Income Statement

PBIT	400
Interest	100
Tax	100

SFP

NCA	1000
CA	800

Equity 1200

LTL	400
CL	200

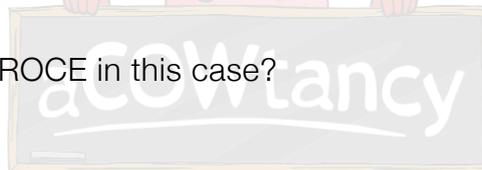
What are the ROE and ROCE in this case?

ROE

$$200 / 1200 = 16.67\%$$

ROCE

$$400 / 1600 = 25\%$$



$$\text{Dividend per share} = \frac{\text{Dividends}}{\text{Ordinary shares}}$$

Simple, but be careful if there has been a rights or bonus issue. This would probably mean a fall in the DPS but each shareholder will now have more shares, so this DPS fall is not as bad as it may first seem.

$$\text{Interest Cover} = \frac{\text{Profit before Interest}}{\text{Interest}}$$

A figure of around 3 is deemed acceptable for a stable company

Obviously a higher figure is recommended if profits are quite volatile

$$\text{Financial Gearing} = \frac{\text{Long term Debt} + \text{preference shares}}{\text{Share Capital} + \text{Reserves}}$$



Share capital can be either book (as above) or market value - be guided by the examiner in the question

The higher the gearing the more risk the company is taking

$$\text{Dividend yield} = \frac{\text{Dividend per share}}{\text{Market price per share}} \times 100$$

This basically says how much dividend did i get back as a % of the share price / cost? However, it fails to take into account any share price growth that the shareholder will ultimately receive.

As DPS is used in this calculation, its limitations above also apply here.

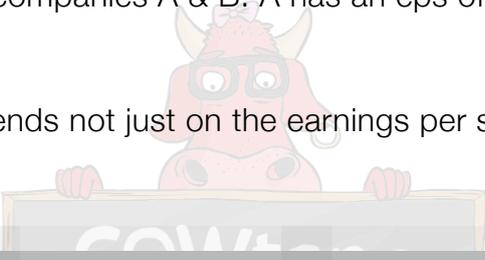
Price-earnings ratio = Market price per share

EPS

	Company A	Company B
EPS	€2	€0.20

Think about 2 different companies A & B. A has an eps of €2 and B of €0.2. Which share would you buy??

The answer, surely depends not just on the earnings per share, but also on how much the share price is!



	Company A	Company B
EPS	€2	€0.20
Share Price	€20	€0.40

If company A had a share price of €20 and B of €0.4 which share looks the best now?

Hopefully you will see company B looks more attractive as the EPS is a bigger percentage of the share price

You are now actually calculating the Price/earnings (PE) ratio shown above!

NOTE!

If a company has a high PE ratio like company A of 10. This means that the market feels the future prospects of the company are good. It does not expect the share to take 10 years to get its money back rather that it expects the future earnings to increase so the EPS will in time get better also.

Total Shareholder Return

The total return earned on a share over a period of time: dividend per share plus capital gain divided by initial share price

Dividend for year + Increase in share price

Share price at start of year

These are very popular questions so take note...

Illustration 1

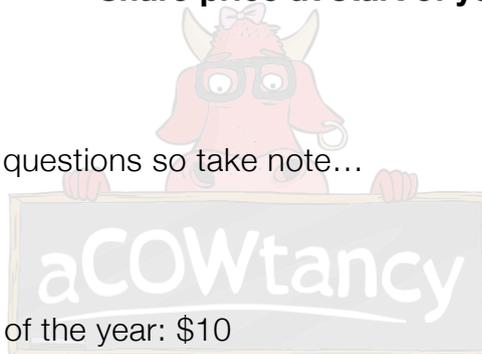
Share price at the start of the year: \$10

Dividend in the year: \$2

Share price at the end of the year: \$14

What is the total shareholder return?

$$(\$2 + \$4) / 10 = 60\%$$



Syllabus A3e: Explain ways to encourage the achievement of stakeholder objectives, including:

i) managerial reward schemes such as share options and performance-related pay

ii) regulatory requirements such as corporate governance codes of best practice and stock exchange listing regulations

Managerial reward schemes

As agents, directors may not always act in ways which increase the wealth of shareholders, a phenomenon called the agency problem.

However they can be encouraged to maximise shareholder wealth by managerial reward schemes such as performance-related pay and share option schemes.

Performance-related pay links part of the remuneration of directors to some aspect of corporate performance, such as levels of profit or earnings per share.

One problem here is choosing the aspect of corporate performance - as managers may influence them for their own benefit rather than the benefit of shareholders, for example, focusing on short-term performance while neglecting the longer term.

Share option schemes bring the goals of shareholders and directors closer together to the extent that directors become shareholders themselves.

Share options allow directors to purchase shares at a specified price on a specified future date, encouraging them to make decisions which exert an upward pressure on share prices.

Unfortunately, a *general* increase in share prices can lead to directors being rewarded for poor performance, while a *general* decrease in share prices can lead to managers not being rewarded for good performance.

However, share option schemes can lead to a culture of performance improvement and so can bring continuing benefit to stakeholders.

Regulatory requirements

Regulatory requirements can be imposed through corporate governance codes of best practice and stock market listing regulations.

Corporate governance codes of best practice, such as the UK Corporate Governance Code, seek to reduce corporate risk and increase corporate accountability.

- Responsibility is placed on directors to identify, assess and manage risk within an organisation.
- An independent perspective is brought to directors' decisions by appointing non-executive directors

Stock exchange listing regulations place obligations on directors:

- To publish regular financial reports
- To provide detailed information on directorial rewards
- To publish detailed reports on corporate governance and corporate social responsibility.



A4: Financial and other objectives in not-for-profit organisations

Syllabus A4a Discuss the impact of not-for-profit status on financial and other objectives

Not-for-Profit (NFP) organisations are defined as those whose mission or priority is **not the pursuit or maximisation of profit**.

These organisations include both **public sector and privately owned** bodies, some of which have charitable status.

The declared mission/objective of the organisation permeates the manner in which the organisation conducts its affairs and has a **direct effect upon the management function**.

A not-for-profit organisation's primary goal is not to increase shareholder value; rather it is to provide some socially desirable need on an ongoing basis. A not-for-profit generally lacks the financial flexibility of a commercial enterprise because it **depends on resource providers who often gain no tangible benefit themselves**.

Thus the not-for-profit must **demonstrate its stewardship of donated resources** — money donated for a specific purpose must be used for that purpose. That purpose is either specified by the donor or implied in the not-for-profit's stated mission.

Budgeting and cash management are two areas of financial management that are extremely important exercises for not-for-profit organisations. The organisation must pay close attention to whether it has enough cash reserves to continue to provide services to its clientele. Cash flow can be extremely challenging to predict, because an organisation relies on revenue from **resource providers that do not expect to receive the service provided**. In fact, an increase in demand for a not-for-profit's services can lead to a management crisis.

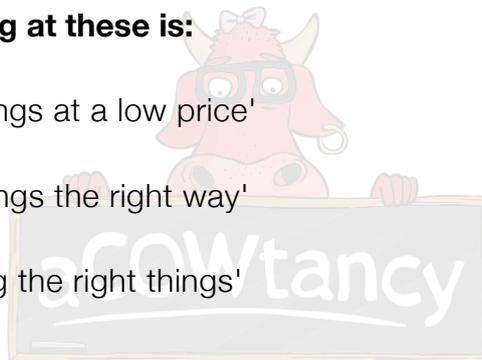
The **non financial objectives** are often more important in not for profit organisations. However, they are harder to quantify eg Quality of care

Value for money can be broken down into the following 3 sectors:

- (a) Economy – Buy goods at minimum cost (still paying attention to quality)
- (b) Efficiency – Use these goods to maximise output
- (c) Effectiveness – Use these goods to achieves objectives

Another way of looking at these is:

- Economy - 'doing things at a low price'
- Efficiency - 'doing things the right way'
- Effectiveness - 'doing the right things'



A final way of looking at these is as input - process - output

Inputs - Economy - get as cheap as possible given quality

Process - Efficiency - perform the process as efficiently as possible

Outputs - Effectiveness - These match the objectives set

Input driven - Try to get as much out given limited inputs eg library

Output driven - Maintaining standards even when output changes eg Prison service

Non-financial information is often better able than straight financial data to measure and justify the intangible goals of Not for Profits.

The high level of **non-financial reporting** will come at a cost, however, in terms of the time and other resources which it necessitates.

Popular types include:

- Measuring outputs, performances or achievements against strategic/business/operational plans;
- Key performance indicators
- Statistics related to service or activity delivery and performance, such as client numbers, user numbers, enquiry numbers, occupancy levels and similar;
- The performance and development of human resources, both staff and volunteers; and
- Reporting on external trends, including social and environmental impacts, also political and economic developments.

Other creative forms of non-financial reporting include statistics on website use, complaint numbers, analysis of media coverage, and measuring board visibility and recognition.

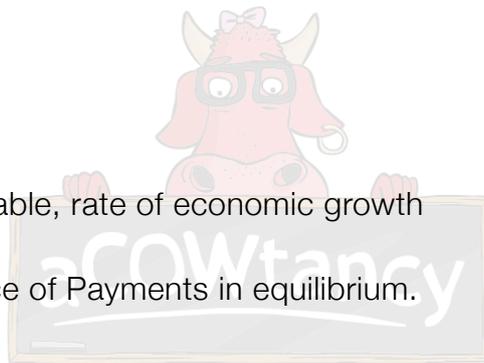
Syllabus B: FINANCIAL MANAGEMENT ENVIRONMENT

B1: The economic environment for business

Syllabus B1a: Identify and explain the main macroeconomic policy targets

The four major objectives are

- I. full employment
- II. price stability
- III. a high, but sustainable, rate of economic growth
- IV. keeping the Balance of Payments in equilibrium.



Full employment was considered very important after the Second World War.

Unemployment in the 80s was seen as an inevitable consequence of the steps taken to make industry more efficient.

De-industrialisation made higher unemployment feel inevitable, and so this objective became much less important than it had been.

Growth and low inflation have always been important.

Without growth peoples' standard of living will not increase, and if inflation is too high then the value of money falls negating any increase in living standards.

Sustainable growth means growth without inflation.

Balance of payments

The total of all the money coming into a country from abroad less all of the money going out of the country during the same period.

Policies to reduce a BOP deficient:

Higher Interest Rates - will act to slowdown the growth of consumer demand and therefore lead to cutbacks in the demand for imports.

Fiscal policy (i.e. increases in direct taxes) might also be used to reduce aggregate demand.

The risk is that a sharp fall in consumer spending might lead to a steep economic slowdown (slower growth of GDP) or an full-scale recession



Syllabus B1b & c: Define and discuss the role of fiscal, monetary, interest rate and exchange rate policies in achieving macroeconomic policy targets. objectives.

Explain how government economic policy interacts with planning and decision-making in business

Fiscal Policy

Definition:

Decisions relating to taxation and government spending with the aim of full employment, price stability, and economic growth.

Discussion:

By changing tax laws, the government can alter the amount of disposable income available to its taxpayers. If taxes increased consumers would have less money to spend. This difference in disposable income would go to the government instead of going to consumers, who would pass the money onto companies.

Or, the government could increase its spending by purchasing goods from companies. This would increase the flow of money through the economy and would eventually increase the disposable income available to consumers.

Unfortunately, this process takes time, as the money needs to wind its way through the economy, creating a significant lag between the implementation of fiscal policy and its effect on the economy.

Monetary Policy

Definition:

The regulation of the money supply and interest rates by a central bank in order to control inflation and stabilise currency.

Discussion:

Monetary policy is one the two ways the government can impact the economy. By impacting the effective cost of money, the government can affect the amount of money that is spent by consumers and businesses.

Interest Rates Policy

Definition:

Interest rate is the percent charged for the use of money. It is charged when the money is being borrowed, and paid when it is being loaned.

Discussion:

When interest rates are high, fewer people and businesses can afford to borrow, so this usually slows the economy down. However, more people will save (if they can) because they receive more on their savings rate.

When the central banks set interest rates it is the amount they charge other banks to borrow money. This is a critical interest rate, in that it affects the entire supply of money, and hence the health of the economy.

High interest rates can cause a recession.

Exchange Rate Policy

Definition:

Policy of government towards the level of the exchange rate of its currency.

Discussion:

It may want to influence the exchange rate by using its gold and foreign currency reserves held by its central bank to buy and sell its currency.

A fall in the exchange rate will mean that the price of imports will rise while exporters should become more internationally competitive. Import volumes should fall whilst export volumes should rise.

Output at home should rise, leading to higher economic growth and a fall in unemployment. There should be an improvement in the current account of the balance of payments too as the gap between export values and import values improves. However, higher import prices will feed through to a rise in inflation in the economy.

Target	Fiscal Policy		Monetary Policy		Exchange Rates
Growth in the Economy	More Spending	Lower Taxes	More money supply	Lower Interest Rates	Lower
Low Inflation	Lower Spending	Increase Taxes	Lower money supply	Higher Interest Rates	Higher
BOP deficit reduction	Lower Spending	Increase Taxes	-	Higher Interest Rates	Lower



Syllabus B1d: Explain the need for, and the interaction with, planning and decision-making in business of:

i) competition policy

ii) government assistance for business

iii) green policies

iv) corporate governance regulation

Competition policy

The Competition Commission prevents takeovers that are against the public interest. Competition policy aims to ensure:

- Wider consumer choice
- Technological innovation, and
- Effective price competition



Government assistance for business

Government grants available for certain investments and small business in areas such as rural development, energy efficiency, education etc

Green policies

Airfuel tax for example can threaten an airline business but create opportunities for other forms of transport or makers of new greener aircraft.

Corporate governance regulation

Regulatory requirements can be imposed through corporate governance codes of best practice and stock market listing regulations.

Corporate governance codes of best practice, such as the UK Corporate Governance Code, seek to reduce corporate risk and increase corporate accountability.

B2: The Nature and Role of Financial Markets and Institutions

Syllabus B2a: Identify the nature and role of money and capital markets, both nationally and internationally

To finance a business the manager has the choice of getting a loan or issuing shares. These are made through the financial markets and institutions.

If the business gets funds **directly** they go to the financial **markets**

If the business gets funds **indirectly** it is through Financial **Institutions** or **Intermediaries** such as merchant banks, pension funds and insurance companies

Financial Markets

A financial market allows people to easily buy and sell financial securities (such as stocks and bonds), commodities (such as precious metals) etc.

General markets (many commodities) and specialised markets (one commodity) exist.

Markets work by placing interested buyers and sellers in one "place", thus making it easier for them to find each other.

So, Financial markets facilitate--

- The raising of capital (in the capital markets);
- The transfer of risk (in the derivatives markets);
- International trade (in the currency markets)

and are used to match those who want capital to those who have it.

Typically a borrower issues a receipt to the lender promising to pay back the capital. These receipts are securities which may be freely bought or sold.

In return for lending money to the borrower, the lender will expect some compensation in the form of interest or dividends.

As the financial markets are normally direct and no financial intermediaries used, this is called **financial disintermediation**

Money Market (short term)

The money market is the global financial market for short-term borrowing and lending.

The money market is where short-term obligations such as

- 1) Treasury bills,
- 2) commercial paper and
- 3) bankers' acceptances

are bought and sold.



Here financial institutions either borrow or lend for short periods of time, typically up to thirteen months.

This contrasts with the capital market for longer-term funding, which is supplied by bonds and equity.

Capital Market (Long term)

A capital market includes the stock market, commodities exchanges and the bond market amongst others.

The capital market is ideal for raising long-term funds

Along with the stock exchanges, support organisations such as brokerage firms also form part of the capital market.

Euromarkets (International Long term)

An overall term for international capital markets dealing in offshore currency deposits held in banks outside their country of origin.

Euro means external in this context. For example, eurodollars are dollars held by banks outside the United States.

It allows large companies with excellent credit ratings to raise finance in a foreign currency.

This market is organised by international commercial banks.

Key Features

Size

much bigger than the market for domestic bonds / debentures.

Cheap debt finance

Can be sold by investors, and a wide pool of investors share the risk

Unsecured

Only issued by large companies with an excellent credit rating

Long-term

Debt in a foreign currency Typically 5-15 years, normally in euros or dollars but possible in any currency

Less regulation

By using Euromarkets, banks and financiers are able to avoid certain regulatory aspects such as reserve requirements and other rules.

However, the reduction in domestic regulations have made the cost savings much less significant than before.

As a result, the domestic money market and Eurocurrency markets are closely integrated for most major currencies, effectively creating a single worldwide money market for each participating currency.

Illustration

German firm sells to buyer in the US. It receives US\$1m cheque. To earn a higher return on the \$1 million the German firm decides to place the funds in deposit with a bank in London, UK.

One million Eurodollars have thus been created.



A financial intermediary is an entity who performs intermediation between two parties.

This basically means that the lender gives money to the borrower indirectly as the financial intermediary sits in-between (hence the term).

It is typically an institution that allows funds to be moved between lenders and borrowers.

That is, savers (lenders) give funds to an intermediary institution (such as a bank), who then gives those funds to spenders (borrowers).

This may be in the form of loans or mortgages.

Alternatively, the savers may lend the money **directly** to the borrower, via the financial markets. Therefore there is no intermediary and so this is known as **financial disintermediation**.

Provide short term finance

By providing a link between investors who have surplus cash and borrowers who have financing needs.

The amounts of cash provided by individual investors may be small, whereas borrowers need large amounts of cash: one of the functions of financial intermediaries is therefore to aggregate invested funds in order to meet the needs of borrowers.

In so doing, they provide a convenient and readily accessible route for business organisations to obtain necessary funds.

Risk Transformation

Small investors are likely to be averse to losing any capital value, so financial intermediaries will assume the risk of loss on short-term funds borrowed by business organisations, either individually or by pooling risks between financial intermediaries.

Maturity transformation

Financial intermediaries also offer maturity transformation, in that investors can deposit funds for a long period of time while borrowers may require funds on a short-term basis only, and vice versa. In this way the needs of both borrowers and lenders can be satisfied.

A stock market (also known as a stock exchange) has two main functions, to provide...

1. A way of issuing shares to people who want to invest in the company.
2. A venue for the buying and selling of shares.

The first function allows businesses to be **publicly traded**, or raise additional capital for **expansion** by selling shares of ownership of the company in a public market.

This enables investors the ability to quickly and **easily sell securities**.

This liquidity is an attractive feature of investing in stocks, compared to other less liquid investments such as real estate.

Exchanges also act as the clearinghouse for each transaction, meaning that they collect and deliver the shares, and **guarantee payment to the seller of a security**.

This eliminates the risk to an individual buyer or seller.

The term "risk and return" refers to the potential financial loss or gain experienced through investments in securities.

A profit is the "return".

The "risk" is the likelihood the investor could lose money.

If an investor decides to invest in a security that has a relatively low risk, the potential return on that investment is typically fairly small and vice-versa.

Different securities—including common stocks, corporate bonds, government bonds, and Treasury bills—offer varying rates of risk and return.

Treasury bills

These are about as **safe** an investment as you can get. There is no risk of default and their short maturity means that the prices of Treasury bills are relatively stable.

Long-term government bonds

These on the other hand, experience price fluctuations in accordance with changes in the nation's interest rates.

Bond prices fall when interest rates rise, but they rise when interest rates drop.

Government bonds typically offer a **slightly higher rate of return than Treasury bills.**

Corporate bonds

Those who invest in corporate bonds have the potential to enjoy a **higher return** on their investment than those who stay with government bonds.

This is because the risk is greater.

The company may default on the bond.

Investors want to make sure that the company plays fair.

Therefore, the bond agreement includes a number of restrictive covenants on the company.

Ordinary shares / Common stock

Common stockholders are the owners of a corporation in a sense, for they have ultimate control of the company.

Their votes on appointments to the corporation's board of directors and other business matters often determine the company's direction.

Common stock **carries greater risks than other types of securities**, but can also prove extremely profitable.

Earnings or loss of money from common stock is determined by the rise or fall in the stock price of the company.

Preference shares

While owners of preferred stock do not typically have full voting rights in the company, no dividends can be paid on the common stock until after the preferred dividends are paid.

B3: The nature and role of money markets

a) Describe the role of the money markets in:

i) Providing short-term liquidity to the private sector and the public sector

ii) Providing short-term trade finance

iii) Allowing an organisation to manage its exposure to foreign currency risk and interest rate risk.

Money Markets

These are for short term lending and borrowing (up to 12 months)

Money market securities are essentially IOUs issued by governments, financial institutions and large corporations.

These instruments are very liquid and considered extraordinarily safe.

Because they are extremely conservative, money market securities offer significantly lower returns than most other securities

Examples of money market instruments include treasury bills, forwards and futures

The buying and selling of futures contracts here will help an organisation manage its exposure to foreign currency and interest rate risk - which we look at in much more detail later

Lenders or savers give money to Financial Intermediaries

Financial intermediaries then use this money for loans to borrowers/spenders

These financial intermediaries are banks, insurance companies, pensions etc

Therefore these banks and other financial institutions provide indirect finance to businesses. It's also called financial intermediation

Why not borrow/lend money directly?

The banks and other financial institutions offer 2 advantages:

1) Transaction cost reduction

These would be really high for individuals but banks with high volumes of transactions use economies of scale to reduce them

2) Credit Risk reduction

This is due to information. The borrower knows a lot more about their ability to repay than the lender knows. This is asymmetric information. It causes credit risk

Banks etc though have many specialists who can assess the borrowers ability to repay and at a cheaper cost than a lender could use individually. Hence they can reduce the credit risk for the lender

Securitisation

This turns illiquid assets into marketable securities (hence the name)

Banks, for example, could convert their long term receivable loans into securities and selling them to big institutional investors

For the banks these mortgages will have different maturity times but selling them as securities takes away this mis-match problem

The security will almost always be backed by an asset e.g. a house in a mortgage backed security

Syllabus B3c: Explain the characteristics and role of the principal money market instruments:

- i) *Interest-bearing instruments*
 - ii) *Discount instruments*
 - iii) *Derivative products*
-

Money market instruments remember are short term and they can give interest, be discounted or be derivative based

Interest Bearing

Certificates of deposit (CDs)

A CD is a receipt for funds deposited in a bank for a specified term and for a set rate

With a CD - if they're negotiable - they can be sold before maturity. Non-negotiable ones just pay a set amount of interest (coupon) and is repaid as normal

Repurchase Agreement

A repo is where 2 parties agree to buy/sell an instrument at an agreed price and then repurchase back at an agreed price a set time later

Discount Instruments

These don't pay interest as such. They are issued at a discount, which effectively means the "interest" is all at the beginning

Think of it from the lenders viewpoint. They wish to lend \$100, but actually only need to lend \$80 (discounted at the start) but are paid back the full \$100.

Treasury Bills

These are issued by governments with maturities from 1m to 12m. They are issued at a discount to their face value

Commercial paper

These are unsecured with a typical term of 30days.

They're issued by large organisations with good credit ratings - funding their short term investment needs

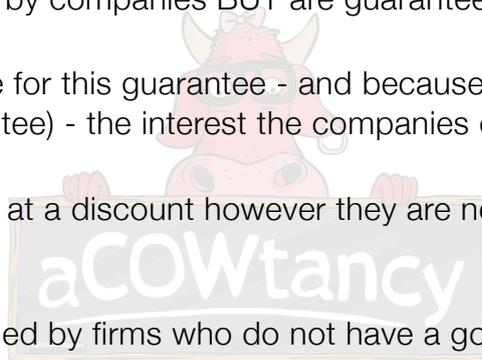
Bankers Acceptance

These again are issued by companies BUT are guaranteed by a bank

The banks will get a fee for this guarantee - and because the risk is low (for the lender due to the bank guarantee) - the interest the companies offer on these will be low

Again these are offered at a discount however they are negotiable, meaning they can be traded before maturity

These are normally issued by firms who do not have a good enough credit rating to offer commercial paper



Syllabus C: WORKING CAPITAL MANAGEMENT

C1: The nature, elements and importance of working capital

Syllabus C1a: Describe the nature of working capital and identify its elements

Working capital is simply the money needed for day to day business.

This money is needed to keep the company alive so its importance cannot be over emphasised. It is the management of each current asset and each current liability that is essential to the business.

Working capital = net current assets = current assets - current liabilities

Current assets

Cash

Inventories

Receivables

Current liabilities

Overdraft

Payables <1 year

Consider this. You are the MD of a new company selling iPhone controlled door locks. Demand is looking good. Your natural inclination is probably to buy more in, to sell in the future.

We call this a short-term investment.

You have invested in inventory to **boost profits** - this is one of the objectives of working capital.

However, you know you also have to pay the lease on your office - luckily you have set aside a little for this.

We call this **liquidity**. Maintaining enough to pay short term payables. This is another of the objectives of working capital.

So we would like to use the working capital for both Short-term investment (profitability) and Liquidity

Hopefully you can see that part of you wants to invest the money and another wishes to save to pay bills.

This is the conflict of working capital objectives.

Concentrating on profits or on liquidity

³ Dec 07 Q4a

The management of working capital is important to the financial health of businesses of all sizes. The amounts invested (this means having high inventory and receivables) in working capital are often high in proportion to the total assets employed and so it is vital that these amounts are used in an efficient and effective way.

However, there is evidence that small businesses are not very good at managing their working capital. Given that many small businesses suffer from undercapitalisation (not having enough long term loans or shares), the importance of exerting tight control over working capital investment is difficult to overstate.

The finance profession recognises the three primary reasons offered by economist John Maynard Keynes to explain why firms hold cash. All three of these reasons stem from the need for companies to possess liquidity.

1) Speculation

To take advantage of special opportunities that if acted upon quickly will favour the firm. An example of this would be purchasing extra inventory at a discount.

2) Precaution

As an emergency fund for a firm.

3) Transaction

Firms hold cash in order to satisfy the cash inflow and cash outflow needs that they have.

C2: Management of inventories, accounts receivable, accounts payable and cash

Syllabus C2a: Explain the cash operating cycle and the role of accounts payable and accounts receivable

The cash operating cycle (also known as the working capital cycle) is the time between cash paid for raw materials and cash received from customers.

- Day 1 Buy an item on credit (Payable)
- Day 5 Sell the item on credit (Receivable)
- Day 8 Pay for the item
- Day 10 Receive the cash for the item

How long is the item in stock for? 4 days

How long is the receivable period? 5 days

How long is the payable period? 7 days

How long between having to pay and receiving the cash? **2 days**

The 2 days is the cash operating cycle. It is how long between paying for an item and eventually receiving the cash. This period needs funding somehow. It's calculated like this:

Inventory Days	4 days
Receivable days	5 days
Payable days	<u>(7 days)</u>
Cash operating cycle	2 days

Note the CASH needed in the gap can get bigger by:

- I. Cycle gets longer (need more cash in proportion to the extra days in cycle)
- II. Sales increase (need more cash in proportion to the extra sales made)

The length of the cycle will depend upon:

- I. Liquidity v profitability decisions (eg credit terms offered)
- II. Management efficiency
- III. Industry norms (supermarkets very short - construction industry very long)



Overtrading⁴

Overtrading or undercapitalisation arises when a company has too small a capital base to support its level of business activity.

Difficulties with liquidity may arise as an overtrading company may have insufficient capital to meet its liabilities as they fall due.

Overtrading is often associated with a rapid increase in turnover. Investment in working capital does not match the increase in sales.

Overtrading could be indicated by a deterioration in inventory days. Possibly because of stockpiling in anticipation of a further increase in turnover, leading to an increase in operating costs.

Overtrading could also be indicated by deterioration in receivables days, possibly due to a relaxation of credit terms.

As the liquidity problem associated with overtrading deepens, the overtrading company increases its reliance on short-term sources of finance, including overdraft, trade payables and leasing.

Overtrading can also be indicated by decreases in the current ratio and the quick ratio.

⁴ Dec 08 Q2b

Syllabus C2b: Explain and apply relevant accounting ratios, including:

i) current ratio and quick ratio

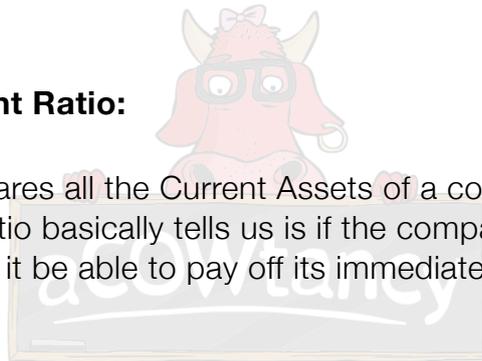
ii) inventory turnover ratio, average collection period and average payable period

iii) sales revenue/net working capital ratio

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Explanation of Current Ratio:

The current ratio compares all the Current Assets of a company to all the Current Liabilities. What this ratio basically tells us is if the company had to sell all its readily available assets, would it be able to pay off its immediate debt?



Quick Ratio

Current Assets - Inventories

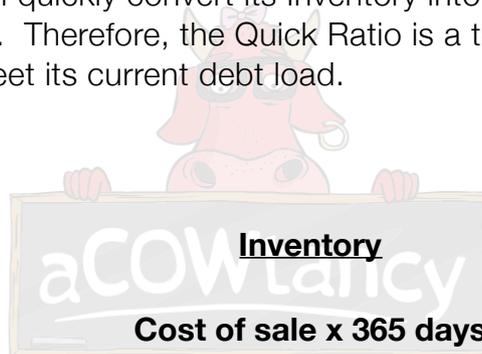
Current Liabilities

Explanation of Quick Ratio:

Also called the Acid-Test Ratio, the current ratio compares all the Current Assets of a company to all the Current Liabilities just like the Current Ratio, but the Inventories are subtracted from the Current Assets. Why?

Not every company can quickly convert its Inventory into cash in the event it had to pay all its Current Liabilities. Therefore, the Quick Ratio is a tougher way to test the company's ability to meet its current debt load.

Inventory Days



Explanation of Inventory Days:

This gives investors an idea of how long it takes a company to turn its inventory (including work in progress) into sales. Generally, the lower (shorter) the better, but it is important to note that the average varies from one industry to another.

Receivables Average Collection Period

The approximate amount of time that it takes for a business to receive payments owed.

Average Accounts Receivable

Credit sales **x 365 (or days in period)**

This measures the average number of days it takes for the company to collect revenue from its credit sales.

This ratio reflects how easily the company can collect on its customers. It also can be used as a gauge of how loose or tight the company maintains its credit policies.

Illustration

A company has total credit sales of \$100,000 during a year and has an average amount of accounts receivables of \$50,000. Its average collection period is therefore 182.5 days

Possessing a lower average collection period is seen as better, because this means that it does not take a company very long to turn its receivables into cash.

Average Payable Period

The approximate amount of time that it takes for a business to make payments owed.

This is **Payables / Cost of sales x 365**

It measures the average amount of time you use each dollar of your trade credit.

A longer average payable period allows you to maximise your trade credit. This means that you are delaying spending cash

Sales Revenue/Net Working Capital Ratio

Sales revenue

Net current assets

Explanation of Sales to Working Capital:

The Sales to Working Capital ratio measures how well the company's working capital is being used to generate sales.

An increasing Sales to Working Capital ratio is usually a positive sign, indicating the company is more able to use its working capital to generate sales.

This ratio is much more effectively used over a number of periods.

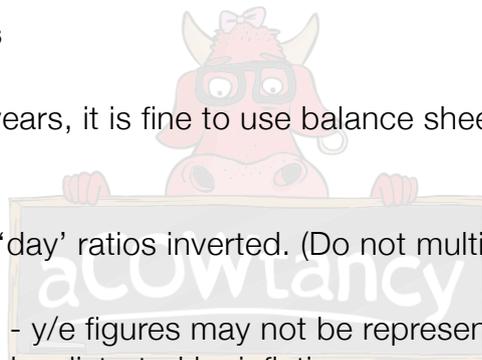
This ratio can help uncover questionable management decisions such as relaxing credit requirements to potential customers to increase sales, increasing inventory levels to reduce order fulfillment cycle times, and slowing payment to vendors and suppliers in an effort to hold on to its cash.

Additional ratio points

If comparing between years, it is fine to use balance sheet (year end) figures instead of averages.

Turnover ratios are the 'day' ratios inverted. (Do not multiply by 365)

Limitations of ratios are - y/e figures may not be representative, they can be manipulated, they are historic and can be distorted by inflation.



Managing Inventory

Economic order quantity

The level of inventory that minimises the total of inventory holding cost and ordering cost

Holding Costs

The more stock you hold the more it costs. So you should keep stock low.

Ordering costs

The more orders you make the more it costs. So you should order lots at a time, meaning fewer orders (but higher stock).

These two costs therefore work in opposite ways. One suggests keep stocks low, the other keep stock high (to keep orders down).

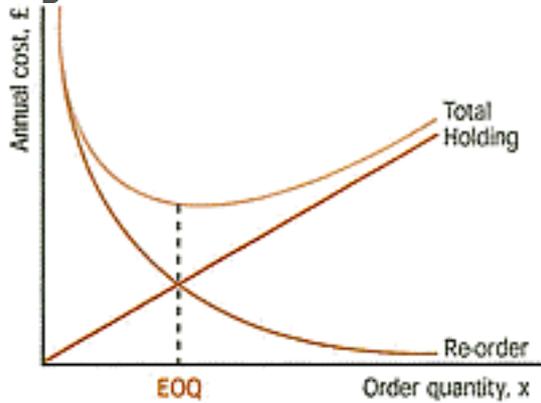
So this is where EOQ will help :)

EOQ⁵

Optimum position is where holding costs = ordering costs. At this point the total cost will be minimised.

⁵ Dec 07 4b; Jun 08 Q3d;

Figure 1



It is calculated like this:

(Given in the exam)

$$\sqrt{\frac{2 \times C_o \times d}{C_h}}$$

C_h

Holding costs (Costs of Holding Stock)

- (i) Warehouse
- (ii) Insurance
- (iii) Obsolescence
- (iv) Opportunity cost of capital

$$= \text{Holding Cost per unit} \times (\text{Order amount} / 2)$$



Ordering costs

1. Administration
2. Delivery costs

= Order cost per unit \times (Annual Demand / Order amount)

Assumptions/Criticisms:

- 1) The ordering cost is constant.
- 2) The annual demand for the item is constant and it is known to the firm.
- 3) Quantity discounts don't exist.
- 4) The order is received immediately after placing the order.
- 5) No buffer stock is required
- 6) Ignores hidden stock holding costs (unreliable suppliers etc)
- 7) Ignores benefit of stock holding (choice etc)

Illustration

Company has annual demand for a raw material costing \$5 per unit of 10,000 units

Ordering cost: \$6 per order.

Holding cost: \$0.5 per unit per year

What is the EOQ?

Solution

Square root $(2 \times 6 \times 10,000 / 0.5) = 490$

At this level the costs are as follows:

Ordering Costs

= Order cost per unit x (Annual Demand / Order amount)

$$= 6 \quad \times \quad 10,000 \quad / \quad 490$$

$$= 122$$

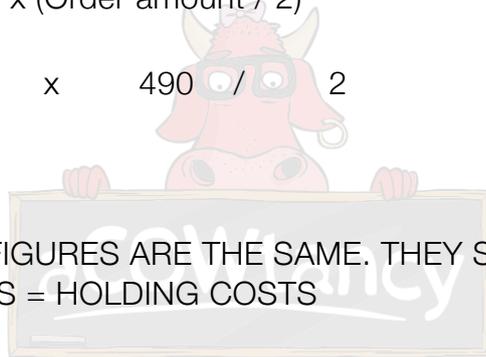
Holding Costs

= Holding Cost per unit x (Order amount / 2)

$$= 0.5 \quad \times \quad 490 \quad / \quad 2$$

$$= 122$$

NOTICE THESE TWO FIGURES ARE THE SAME. THEY SHOULD BE AS THE EOQ IS WHERE ORDER COSTS = HOLDING COSTS



EOQ with Buffer Stock

So, EOQ looks at how much to order, now lets look at when.

The answer should be obvious - it is when you run out of stock.

However you need to reorder before that to give the stock time to arrive.

So you don't re-order when there's zero stock you have to re-order before then. We call this the lead time

It is the amount of stock you use up normally in the time it takes the stock to arrive after buying it - this is the re-order level

However we often re-order before it gets down to this amount - just to be on the safe side.

This extra amount is known as buffer stock

Using EOQ with Buffer Stock

1) Calculate Buffer stock (if not given)

Re-order level - Stock used in lead time (Lead time (in weeks) x Amount used per week)

2) Calculate EOQ and costs ignoring buffer stock

3) Add on HOLDING costs for buffer stock

Dec 07 Exam Question

The current policy is to order 100,000 units when the inventory level falls to 35,000 units. Forecast demand to meet production requirements during the next year is 625,000 units. The cost of placing and processing an order is €250, while the cost of holding a unit in stores is €0.50 per unit per year. Both costs are expected to be constant during the next

year. Orders are received two weeks after being placed with the supplier. You should assume a 50-week year and that demand is constant throughout the year

Calculate size of buffer stock: Re-order level - (Lead time x Amount used per week)

$$35,000 - (2 \text{ weeks} \times 625,000/50) = 10,000$$

Calculate EOQ ignoring buffer stock

$$= \text{Square root } (2 \times 250 \times 625,000 / 0.5) = 25,000$$

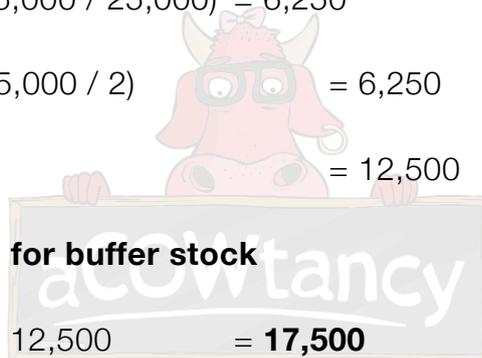
$$\text{Order cost} = 250 \times (625,000 / 25,000) = 6,250$$

$$\text{Holding cost} = 0.5 \times (25,000 / 2) = 6,250$$

$$= 12,500$$

Add on holding costs for buffer stock

$$10,000 \times 0.5 = 5,000 + 12,500 = \mathbf{17,500}$$



EOQ with bulk discounts

Bulk buying discounts may be available if the order quantity is above a certain size. To calculate the best order quantity then we need to:

- A) Calculate EOQ in normal way (and the costs)
- B) Calculate the costs at the lower level of each discount above the EOQ

Then choose the lowest cost option!

Illustration

Demand is 100 units per month. Purchase cost per unit £10. Order cost £20

Holding cost 10% p.a. of stock value.

Required

Calculate the minimum total cost with a discount of 2% given on orders of 350 and over

Solution

- 1) Calculate EOQ in normal way (and the costs)
- 2) Calculate costs at the lower level of each discount above the EOQ

$$1) \text{ Sq root } 2 \times 20 \times 1200 / 1 = 219$$

Ordering Costs

= Order cost per unit x (Annual Demand / Order amount)

$$= 20 \quad \times \quad 1200 \quad / \quad 219$$

$$= 110$$

Holding Costs

= Holding Cost per unit x (Order amount / 2)

$$= 1 \quad \times \quad 219 \quad / \quad 2$$

$$= 110$$

$$= \mathbf{220}$$

At discount level 350

Ordering Costs

= Order cost per unit x (Annual Demand / Order amount)

$$= 20 \quad \times \quad 1200 \quad / \quad 350 = 69$$

Holding Costs

= Holding Cost per unit x (Order amount / 2)

$$= 0.98 \quad \times \quad 350 \quad / \quad 2 = 171.5$$

$$= \mathbf{240.5}$$

240.5 is higher than 220 (it would be as EOQ is the best level) However we now need to take into account the 2% price discount

$$\text{Discount} = 2\% \times 1200 \times 10 = 240$$

Clearly with the discount being offered the company should take the discount and order at 350

Just-in-time (JIT)

An inventory strategy which reduces in-process inventory.

In order to achieve JIT the process must have **signals** of what is going on elsewhere within the process. These signals tell production processes when to make the next part.

They can be simple **visual** signals, such as the presence of a part on a shelf.

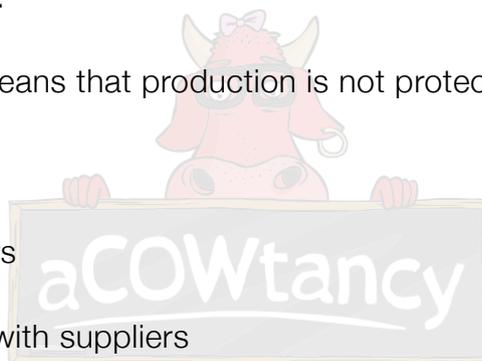
Quick communication of the consumption of old stock which triggers new stock to be ordered is key to JIT and inventory reduction.

JIT emphasises inventory as one of the **seven wastes** (overproduction, waiting time, transportation, inventory, processing, motion and product defect), and so aims to reduce buffer inventory to zero.

Zero buffer inventory means that production is not protected from external shocks

5 Key aspects to JIT

- I. Multi skilled workers
- II. Close relationship with suppliers
- III. Reduced set up times
- IV. Quality
- V. Teams working in cells



Syllabus C2d: Discuss, apply and evaluate the use of relevant techniques in managing accounts receivable, including:

*i) assessing creditworthiness ii) managing accounts receivable iii) collecting amounts owing iv) offering early settlement discounts v) using factoring and invoice discounting
vi) managing foreign accounts receivable*

Managing Receivables⁶

Assessing Credit worthiness

The process of evaluating an applicant's request for credit in order to determine the likelihood that the borrower will live up to his/her obligations.

Assessment of creditworthiness depends on the analysis of information relating to the new customer. This information is often generated by a third party and includes bank references, trade references and credit reference agency reports. The depth of credit analysis depends on the amount of credit being granted, as well as the possibility of repeat business.

Managing Accounts Receivable

Policy formulation

The elements to be considered include establishing terms of trade, such as period of credit offered and early settlement discounts; deciding whether to charge interest on overdue accounts; determining procedures to be followed when granting credit to new customers; establishing procedures to be followed when accounts become overdue, and so on.

Credit Analysis

Assessment of creditworthiness depends on the analysis of information relating to the new customer. This information is often generated by a third party and includes bank references, trade references and credit reference agency reports. The depth of credit analysis depends on the amount of credit being granted, as well as the possibility of repeat business.

⁶ PP Q3c; Dec 07 Q4c

Credit Control

Once credit has been granted, it is important to review outstanding accounts on a regular basis so overdue accounts can be identified. This can be done, for example, by an aged receivables analysis. It is also important to ensure that administrative procedures are timely and robust, for example sending out invoices and statements of account, communicating with customers by telephone or e-mail, and maintaining account records should utilise the 'Credit Policy' to receive, record, maintain, and most importantly, control credit sales.

Collecting amounts owing

Ideally, all customers will settle within the agreed terms of trade. If this does not happen, a company needs to have in place agreed procedures for dealing with overdue accounts.

These could cover logged telephone calls, personal visits, charging interest on outstanding amounts, refusing to grant further credit and, as a last resort, legal action. With any action, potential benefit should always exceed expected cost. Two other commonly used methods of debt collection are:

- I. Early settlement discounts
- II. Debt factoring

Offering early settlement discounts⁷

So if you offer a discount - you are saying please pay me early. Why?

Well you want the money to reduce your overdraft and so save you interest

But the discount is a cost

⁷ PP Q3a

So the idea here is to see if the interest saved on the overdraft is higher than the cost of the discount - this is how you do it:

Step 1: Calculate interest saving of less receivables (Change in Receivables x overdraft rate)

Step 2: Calculate cost of discount

Step 3: See which is higher!

Illustration

Company has credit sales of 1200 and a 3 month credit policy.

A potential new policy is to offer 2% early settlement discount (within 10 days) and a new credit policy for the remainder of 2 months

20% will take the discount. Cost of capital (overdraft) 10%

Step 1: Receivables before = $3/12 \times 1200 = 300$

Receivables after = $2/12 \times 80\% \times 1200 = 160$

+ $10/365 \times 20\% \times 1200 = 7$

$(300-167) \times 10\% = 13$ interest saved

Step 2: $2\% \times 20\% \times 1200 = 4.8$ cost of discount

The saving is greater than the cost of discount so the discount should be offered

Debt Factoring⁸

Here a financial company takes over the management of a company's trade receivables. This will include:

- Invoicing customers
- Accounting for sales and collections of amounts owed.

Factors sometimes advance cash to a company against the amounts outstanding and also offer insurance against bad debts (non-recourse factoring).

Factoring helps manage trade receivables through the expertise offered by the factoring company... providing:

a reduction in bad debts

a decrease in the level of trade receivables

a decrease in the amount of managerial time devoted to chasing slow payers

allows the company to take advantage of early settlement discounts from their suppliers



Advantages	Disadvantages
Admin Costs Saved	Can be expensive
Gets Cash Quickly	Could lose customer goodwill

⁸ Dec 08 Q2c

Advantages	Disadvantages
More cash available as sales grow	May give a bad impression

For calculation questions - about whether to accept a Factor arrange or not you need to compare:

Current cost (Receivables x overdraft rate, Admin, Bad debts etc)

New cost with Factor (New receivables x overdraft rate, Fee, net cost of forwarding money less any increase in contribution)

Illustration

Company has credit sales of 200,000pa. Credit term is 30 days.

The factor offers to buy for 80% at an interest rate of 9%. The company can get an overdraft for 6%. The factor charges 1.5% of current credit sales.

The factor will offer customers an early settlement discount if paid in 15 days, 40% will accept this and the remainder will take 50 days to pay. Sales will increase by 5% and contribution to sales ratio is 40%

Should the factor's offer be accepted?

Solution

Current cost

Receivables = $30/365 \times 200000$ = 16,438

These are financed by an overdraft at 6% = 986

TOTAL = **986**

Cost of Factor

$$\text{New receivables} = \text{New sales} \times 15/365 \times 40\% = 3,452$$

$$\text{New receivables} = \text{New sales} \times 50/365 \times 60\% = 17,260$$

$$\text{Financed by overdraft cost at 6\%} = \mathbf{1242}$$

$$\text{Factor Fee} = 200,000 \times 1.5\% = 3,000$$

$$\text{Increase in contribution} = \text{sales increase} \times 40\% = (4,000)$$

$$\text{Forward Cost} = \text{new sales} \times 80\% \times (9-6\%) = 497.10$$

$$= \mathbf{739.1}$$

So Current cost = 986

New cost = 739.1



The factor option costs less - so the factor's offer should be taken up

Invoice discounting⁹

This is where a financial institution (eg Bank) purchase an invoice off a company at a discount.

- It provides immediate cash to a company (rather than waiting for the invoices to be settled)
- It tends to be used as an occasional source of short-term finance (rather than a regular source of cash)
- It accelerates cash inflow from trade receivables when short-term cash flow problems arise.



⁹ Jun08 Q3b;

Managing foreign accounts receivable ¹⁰

The more complex nature of trade transactions and their elements means foreign accounts receivable need more investment than their domestic counterparts

The risk of bad debts is higher with foreign accounts receivable. Exporters seek to reduce the risk of bad debt and to reduce the level of investment in foreign accounts receivable.

These are the options to help:

Agree early payment with an importer

For example by payment in advance, payment on shipment, or cash on delivery. These terms of trade are unlikely to be competitive however,

Use bills of exchange

A signed agreement to pay the exporter on an agreed future date, supported by a documentary letter of credit, can be discounted by a bank to give immediate funds.

Documentary letters of credit

Are a payment guarantee backed by banks. They carry almost no risk, provided the exporter complies with the terms and conditions

Assess the creditworthiness

Of new customers, such as bank references and credit reports.

¹⁰ Jun 09 3c

Insurance

can also be used to cover some of the risks associated with giving credit to foreign customers. This would avoid the cost of seeking to recover cash due from foreign accounts receivable through a foreign legal system, where the exporter could be at a disadvantage due to a lack of local or specialist knowledge.

Export factoring

can also be considered, where the exporter pays for the specialist expertise of the factor as a way of reducing investment in foreign accounts receivable and reducing the incidence of bad debts.



Syllabus C2e: Discuss and apply the use of relevant techniques in managing accounts payable

i) using trade credit effectively

ii) evaluating the benefits of discounts for early settlement and bulk purchase

iii) managing foreign accounts payable

Managing Payables

Using Trade Credit Effectively

Clearly it is best to take as much advantage of trade credit as possible. Paying later is almost always beneficial. However, a company needs to ensure it does not annoy its vital suppliers by missing deadlines and also the company may seek to take advantage of early settlement discounts.

Early settlement and bulk purchase discounts

Trade credit is a simple and often free source of finance. It is not free, however, if an early payment discount is foregone.

Method

Simply compare:

1 The discount offered to

2 The cost of having to pay early (see this as needing to increase your overdraft - so the cost is the overdraft interest rate x cost of item)

Illustration

Discount of 1% for an early settlement on goods worth 1,000,000pa if paid in 10 days (normal 30)

Overdraft interest rate is 10%

Interest cost:

$$20/365 \times 1,000,000 \times 10\% = 5,749$$

Discount saved

$$1\% \times 1,000,000 = 10,000$$

Company should take the discount as the profit saved is higher than the extra interest cost



Managing foreign accounts payable

The problem here is the risk of the **exchange rate moving** against you.

To combat this a company can purchase **derivatives** or pay into an overseas bank account immediately, earning interest until they pay off the invoice in the future.

Syllabus C2f: Explain the various reasons for holding cash, and discuss and apply the use of relevant techniques in managing cash, including:

- i) preparing cash flow forecasts to determine future cash flows and cash balances*
 - ii) assessing the benefits of centralised treasury management and cash control*
 - iii) cash management models, such as the Baumol model and the Miller-Orr model*
 - iv) investing short-term*
-

Managing Cash

Preparing Cash flow forecasts¹¹

It sounds painfully obvious but remember the only thing that goes into a cashflow forecast is CASH!

That means if you sell on credit - see when you're paid and put the money in your cashflow forecast for that month

No depreciation or accounting adjustments

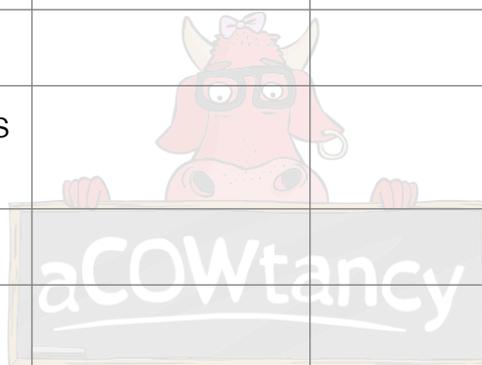
A forecast will look something like this:

Short term cash flow forecasts

Cash Forecast for the Three Months Ended 31 March 20X1

¹¹ Jun 09 Q3b

	January	February	March
Cash Receipts			
Sales			
Issue of shares			
Cash Payments			
Purchases			
Dividends			
Tax			
Non Current Assets			
Wages			
Cash Surplus / deficit			
Cash b/f			
Cash c/f			



I repeat - not all expenses in the income statement are cash eg depreciation/accruals. Not all sales are cash - only put them in the table when cash is **RECEIVED**. Not all purchases of NCA are cash eg Finance leases - just put in the cash **PAID** to the lessor.

When preparing cashflow forecasts make sure your work is clearly laid out and referenced to workings. There is nothing difficult just needs practice

Illustration

A lady decides to set her own business so needs to go to a bank with a cashflow forecast. She has £6,000 to invest herself. She expects to buy some non current assets for 10,000, which have a 5 year life. These will be bought immediately.

Then she will need buffer stock of £1,000 acquired at the beginning of January and subsequent monthly stock to meet her expected sales demand

Forecast sales are 5,000 in February and rising by 10% per month. Selling price is calculated using a mark up of 50%. 1 months credit is allowed by suppliers and 1 month given to customers also. Operating costs are 500 per month plus drawings of 500. Prepare a cashflow for Jan, Feb, March

	January	February	March
Cash Receipts			
Sales	-	-	5,000
Issue of shares			
Cash Payments			
Purchases	-	-1,000	-3,333
Dividends			
Operating costs	-500	-500	-500
Non Current Assets	-10,000		
Drawings	-500	-500	-500
Cash Surplus / deficit	-11,000	-2,000	667
Cash b/f	6,000	-5,000	-7,000
Cash c/f	-5,000	-7,000	-6,333

Benefits of centralised Treasury management & cash control

The treasury of a multinational corporation relies, to a certain extent, on the expertise of local business. However, the benefits of centralisation sometimes come at the expense of **losing touch with this vital regional knowledge.**

This could be avoided by careful restructuring of treasury operations. The road starts with the selection of the treasury **processes most suitable to centralisation.**

Each of the main treasury processes (short-term finance and liquidity management; long-term finance; risk management) should be analysed to identify how centralisation could create additional benefits.

The key argument for a centralised process is **control and coordination of activities.**

Risk is controlled when the **philosophy of the company is clear** and implemented from a central process. This avoids the temptation of local management to put a local flair on company philosophy.

A recent study by Michael Gold and Andrew Campbell of the London Business School found that different and equally successful corporations balanced local and corporate control in different ways. **Some emphasised strong centralised strategy development with local freedom to implement strategies;** others set financial standards at the corporate level and left business units to devise their own strategies and operational plans; others practiced a mix. All of the companies in the study sought the benefits of local autonomy while not giving up corporate control.

Control versus responsiveness is the underlying issue to address when considering centralising or decentralising. When controls and consistency are necessary to the organisation, centralisation provides the cornerstone. Consistent reporting up and down the corporate chain and knowledge of where the information resides without duplication, can be the greatest reason to keep certain functions in a central location.

Inherent in the concept of centralisation is the **potential delay in decision making and information processing.** Centralised decisions require the local manager to seek permission from central management. The central manager has to deliberate and convey his decision back down to local management for implementation. This process can take time and slow down decision making. The overall responsiveness of the corporation may suffer, with potentially damaging results.

Mathematical Cash management models

In order to determine the target cash balance the firm must do cost-benefit analysis of holding cash.

The target cash balance involves **trade off** between the opportunity costs of holding too much cash and the trading costs of holding too little.

The following two models allow us to see how much cash we should hold. For example if we know a division needs \$100,000 during the year, how much should we transfer into their account? All of it would mean some of the cash lying in the account doing nothing at the early stages. Just transferring bits at a time (when the cash is needed) would mean lots of transaction costs.

The Baumol model

Opportunity cost (of holding too much cash)

= Average cash balance x Interest rate;

$$= C/2 \times i$$



Trading cost (of holding too little cash)

= Total disbursements during period/ Initial Cash balance x given fixed cost;

$$(T/C) \times F$$

Total Cost = Opportunity cost + Trading cost

$$= (C/2) \times i + (T/C) \times F$$

To calculate the optimum amount of cash to transfer use this equation:

√

$$\frac{2 \times F \times T}{i}$$

Subsonic Speaker
annual transactions of
cost of converting
\$264.50 per
annual opportunity

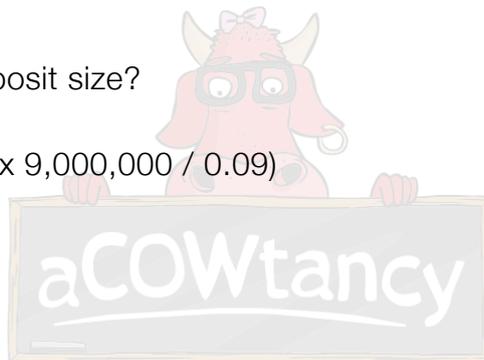
i

Systems (SSS) has
\$9 million. The fixed
securities into cash is
conversion. The
cost of funds is 9%.

What is the optimal deposit size?

Square root (2 x 264.5 x 9,000,000 / 0.09)

= 230,000



Limitations of the Baumol model

- 1) Assumes a constant disbursement rate; in reality cash outflows occur at different times, different due dates etc.
- 2) Assumes no cash receipts during the projected period, obviously cash is coming in and out on a frequent basis
- 3) No safety stock of cash is allowed for, reason being it only takes a short amount of time to sell marketable securities

Miller-Orr Model¹²

This model deals with cash inflows/outflows that change on a daily basis

The model works in terms of upper and lower control limits, and a target cash balance. As long as the cash balance remains within the control limits the firm will make no transaction.

To use the Miller-Orr model, the manager must do 4 things

1. Set the lower control limits for the cash balance. This lower limit can be related to a minimum safety margin decided by management
2. Estimate Standard deviation of daily cash flows
3. Determine Interest Rate
4. Estimate the trading costs of buying and selling marketable securities.

When the firm's cash fluctuates at random and touches the upper limit, the firm buys sufficient marketable securities to come back to a normal level of cash balance i.e. the return point

Similarly, when the firm's cash flows wander and touch the lower limit, it sells sufficient marketable securities to bring the cash balance back to the normal level i.e. the return point

¹² PP Q3b

Spread = $3(3/4 \times 50 \times 4,000,000 / 0.00025)$ power of $1/3 = 25,303$

Upper limit = $8,000 + 25,303 = 33,303$

Return point = $8,000 + (1/3 \times 25,303) = 16,434$

NOTE

The cashflow variance is DAILY. Also the standard deviation is the square root of the variance. Therefore if given the standard deviation then you need to square it before putting it into the equation.

The interest rate is also a daily one. A quick (if oversimplified way) of reaching this simply to divide the annual rate by 365)

Benefits

- Allows for net cash flows occurring in a random fashion.
- Transfers can take place at any time and are instantaneous with a fixed transfer cost.
- Produces control limits which can be used as basis for balance management.

Limitations

- May prove difficult to calculate.
- Monitoring needs to be continuous for the organisation to benefit.

C3: Determining working capital needs and funding strategies

Syllabus C3a: Calculate the level of working capital investment in current assets and discuss the key factors determining this level, including:

- i) the length of the working capital cycle and terms of trade*
 - ii) an organisation's policy on the level of investment in current assets*
 - iii) the industry in which the organisation operates*
-

There are a number of factors that determine the level of investment in current assets and their relative importance varies from company to company.

Length of working capital cycle

The working capital cycle or operating cycle is the period of time between when a company settles its accounts payable and when it receives cash from its accounts receivable.

As the operating period lengthens, the amount of finance needed increases. Companies with comparatively longer operating cycles than others in the same industry sector, will therefore require comparatively higher levels of investment in current assets.

Terms of trade

These determine the period of credit extended to customers, any discounts offered for early settlement or bulk purchases, and any penalties for late payment.

A company whose terms of trade are more generous than another company in the same industry sector will therefore need a comparatively higher investment in current assets.

Policy on level of investment in current assets ¹³

Even within the same industry sector, companies will have different policies regarding the level of investment in current assets, depending on their **attitude to risk**.

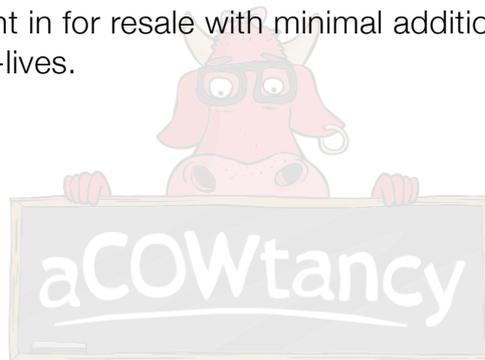
¹³ Jun 08 Q3a

A company with a comparatively conservative approach to the level of investment in current assets would maintain higher levels of inventory, offer more generous credit terms and have higher levels of cash in reserve than a company with a comparatively aggressive approach.

While the more aggressive approach would be more profitable because of the lower level of investment in current assets, it would also be more risky, for example in terms of running out of inventory in periods of fluctuating demand or of failing to have the particular goods required by a customer

Industry in which organisation operates

Some industries, such as aircraft construction, will have long operating cycles due to the length of time needed to manufacture finished goods and so will have comparatively higher levels of investment in current assets than industries such as supermarket chains, where goods are bought in for resale with minimal additional processing and where many goods have short shelf-lives.



Syllabus C3b: Describe and discuss the key factors in determining working capital funding strategies, including:

i) the distinction between permanent and fluctuating current assets

ii) the relative cost and risk of short-term and long-term finance

iii) the matching principle

iv) the relative costs and benefits of aggressive, conservative and matching funding policies

v) management attitudes to risk, previous funding decisions and organisation size

The distinction between permanent and fluctuating current assets¹⁴

When considering how working capital is financed, it is useful to divide assets into non-current assets, permanent current assets and fluctuating current assets.

Permanent current assets

represent the core level of working capital investment needed to support a given level of sales. As sales increase, this core level of working capital also increases.

Fluctuating current assets

represent the changes in working capital that arise in the normal course of business operations, for example when some accounts receivable are settled later than expected, or when inventory moves more slowly than planned.

The relative cost and risk of short-term and long-term finance

Long-term debt has a higher cost for the company

than short-term debt in normal circumstances because lenders require higher compensation for lending for longer periods or because the risk of default increases with longer lending periods.

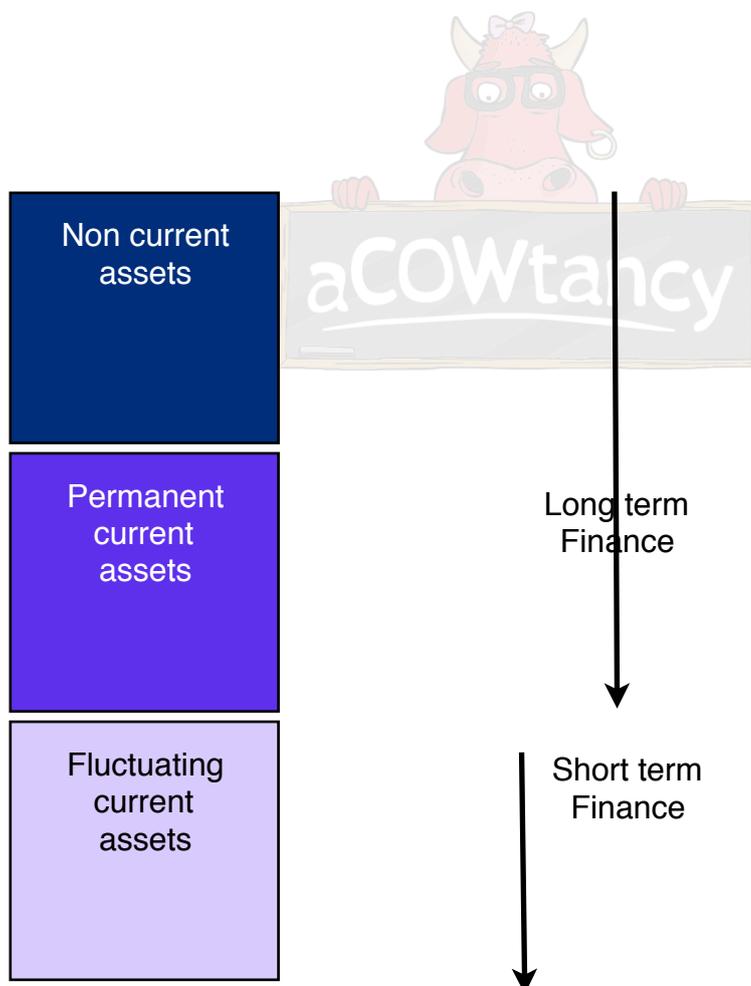
¹⁴ PP Q3d; Jun 09 Q3a; Dec 09 Q4

Long-term debt is more secure for the company (so they pay more for it)

from a company point of view than short-term debt since, provided interest payments are made when due and the requirements of restrictive covenants are met, terms are fixed to maturity.

Short-term debt is riskier for the company (and so costs less for them)

than long- term debt because, for example, an overdraft is repayable on demand and short-term debt may be renewed on less favourable terms.



The matching principle

Use long-term finance

For both **permanent current assets** and non-current assets

Use short-term finance

to cover the short-term changes in current assets represented by **fluctuating current assets**

	Matching	Conservative	Aggressive
Non Current Assets	Long term Financing	Long term Financing	Long term Financing
Permanent Current	Long term Financing	Long term Financing	Long term Financing & Short term Financing
Fluctuating Assets	Short term Financing	Long term Financing & Short term Financing	Short term Financing

Conservative working capital funding policy

will use a higher proportion of **long-term finance** than a matching policy, thereby financing some of the fluctuating current assets from a long-term source.

This will be less risky and less profitable than a matching policy, and will give rise to occasional short-term cash surpluses.

Aggressive working capital funding policy

will use a lower proportion of long-term finance than a matching policy, financing some of the permanent current assets from a **short-term source such as an overdraft**. This will be more risky and more profitable than a matching policy

Management attitudes to risk, previous funding decisions and organisation size

Management attitudes to risk will determine whether there is a preference for a conservative, an aggressive or a matching approach. Previous funding decisions will determine the current position being considered in policy formulation.

The size of the organisation will influence its ability to access different sources of finance. A small company, for example, may be forced to adopt an aggressive working capital funding policy because it is unable to raise additional long-term finance, whether equity or debt.



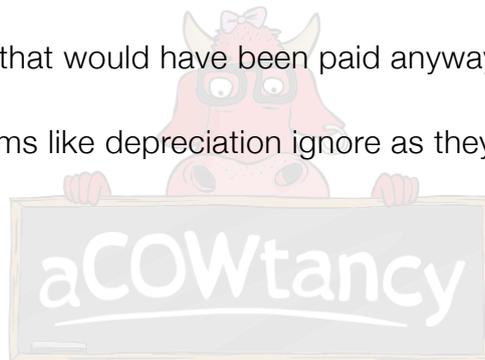
Syllabus D: INVESTMENT APPRAISAL

D1: Investment appraisal techniques

Syllabus D1a: Identify and calculate relevant cash flows for investment projects

Relevant cashflows

- **Future** (ignore past costs)
- **Incremental** (A cost that would have been paid anyway can be ignored)
- **Cash** (Accounting items like depreciation ignore as they are not cash)



Payback Period

The payback period is the length of time that it takes for a project to recoup its initial cost out of the cash receipts that it generates. This period is some times referred to as "the time that it takes for an investment to pay for itself."

The basic idea of the payback method is that the more quickly the cost of an investment can be recovered, the more desirable is the investment.

This is used when a company is primarily worried about **Liquidity**

It simply measures how long it takes the project to recover the initial cost. Obviously, the quicker the better.

Illustrations

Constant cashflow



Initial cost	3.6 million
Cash in annually	700,000

What is the payback period?

$$3,600,000 / 700,000 = 5.1429$$

Take the decimal (0.1429) and multiply it by 12 to get the months - in this case 1.7 months

So the answer is **5 years and 1.7 months**

Non-Constant Cashflows:

Investment cost 800

Cash inflows:

Year 1	200
Year 2	300
Year 3	280
Year 4	120
Year 5	480

The key here is to see the net cashflow each year cumulatively - so the net cashflow in year 1 is $-800 + 200 = -600$

Carry this on..

$$\text{Year 2} = -600 + 300 = -300$$

$$\text{Year 3} = -300 + 280 = -20$$

$$\text{Year 4} = -20 + 120 = 100$$

Stop when the cumulative figure becomes positive - this is the year of payback

So the payback is in year 4 here - but what month?

Simply take the opening balance and divide it by the cashflow for the year it becomes positive - so $-20 / 120 = .1667$ then multiply that by 12 for = 2 months

So the payback was the 2nd month of the 4th year - or 3 years and 2 months

Syllabus D1c: Calculate discounted payback and discuss its usefulness as an investment appraisal method

So we could also discount the cash inflows for the time value of money - let's see that done again with the same numbers as the last example - discounting down by 10%

Investment cost 800

Cash inflows:

$$\text{Year 1 } 200 / 1.10 = 182$$

$$\text{Year 2 } 300 / 1.10^2 = 248$$

$$\text{Year 3 } 280 / 1.10^3 = 210$$

$$\text{Year 4 } 120 / 1.10^4 = 82$$

$$\text{Year 5 } 480 / 1.10^5 = 298$$



So the cumulative values would be

$$\text{Year 1 } -800 + 182 = -618$$

$$\text{year 2 } -618 + 248 = -370$$

$$\text{Year 3 } -370 + 210 = -160$$

$$\text{Year 4 } -160 + 82 = -78$$

$$\text{Year 5 } -78 + 298 = 220$$

So payback is 4 years and $(-78 / 220 \times 12)$ 4.25 months

Evaluation of the Payback Period Method:

The payback method is not a true measure of the profitability of an investment. Rather, it simply tells the manager how many years will be required to recover the original investment. Unfortunately, a shorter payback period does not always mean that one investment is more desirable than another.

Unfortunately, the payback method doesn't highlight differences in useful life between investments. Such differences can be very important, and relying on payback alone may result in incorrect decisions.

For example in the illustration above the final year inflow of 480 was ignored as being not necessary in the simple payback method. This is because it focusses on liquidity (time to payback) and not overall profitability

On the other hand, under certain conditions the payback method can be very useful. For one thing, it can help identify which investment proposals are in the "ballpark." That is, it can be used as a screening tool to help answer the question, "Should I consider this proposal further?"

If a proposal does not provide a payback within some specified period, then there may be no need to consider it further.

In addition, the payback period is often of great importance to new firms that are "cash poor." When a firm is cash poor, a project with a short payback period but a low rate of return might be preferred over another project with a high rate of return but a long payback period.

The reason is that the company may simply need a faster return of its cash investment.

And finally, the payback method is sometimes used in industries where products become obsolete very rapidly - such as consumer electronics.

Since products may last only a year or two, the payback period on investments must be very short.

In summary, the benefits are:

- Simple
- Good when the project is subject to quick change like technology. This is because cashflows in the future become harder and harder to predict so recovering the money as soon as possible is vital.
- It minimises risk (short term projects favoured)
- It maximises liquidity
- Uses cashflows not false profits

Drawbacks

- the item with the quickest payback is simply that. What about afterwards, does it still do well or does it then become obsolete?
- It ignores the whole profitability. Also the time value of money is ignored (more of that later).



Return on capital employed (ROCE)

Here's another way of calculating this important ratio used to evaluate investments is Remember ROCE is also called accounting rate of return

Average annual profit (PBIT) of the investment

Average investment $((\text{cost} + \text{scrap})/2)$

The key here is to be able to calculate the 2 things above correctly - this is how you do it...

Average Annual profit

The trick here is he may give you cashflows... so...

- 1) Add all the cashflows together
- 2) Take away the depreciation for the whole project (Cost - residual value)
- 3) Divide by the number of years

Average Investment

This is the average amount it was on your SFP at - and is easily calculated as follows..

- 1) $(\text{Cost} + \text{Residual Value}) / 2$

ROCE

This is used when company's are more interested in **PROFITABILITY** than liquidity

Unlike the other capital budgeting methods that we have discussed, the simple rate of return method does not focus on cash flows. Rather, it focuses on accounting net operating income.

The answer is expressed as a percentage and can be **compared to the target return** you would like to get. Clearly it has to be higher than say the interest rate on the loan you used to buy the capital item.

More correctly it has to be **higher than the company's cost of capital** (more of that later)

Illustration

Cool & Trendy are considering expanding their internet cafe business by buying a shack in jamaica which will cost £175,000 to buy the business and a further £75,000 to refurbish.

They expect to sit back and chill while the following cash comes in:

Year Net Cash Profits (£)

1 35,000

2 35,000

3 40,000

4 50,000

5 50,000

6 60,000



The equipment will be depreciated to a zero resale value over the same period and, after the sixth year, the cool brothers are going to move onto the next big thing and sell this for a lovely £175,000.

Required

Calculate the ROCE of this investment (using the average investment method) **and the payback period**

Average Annual profit

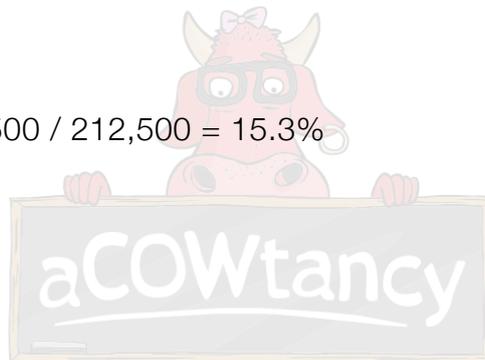
- 1) Add all the cashflows together = 270,000
- 2) Take away the depreciation for the whole project (Cost - residual value) = (250,000 - 175,000) = 75,000
- 3) Divide by the number of years = (270,000 - 75,000) / 6 = **32,500**

Average Investment

This is the average amount it was on your SFP at - and is easily calculated as follows..

- 1) (Cost + Residual Value) / 2 = (250,000 + 175,000) / 2 = **212,500**

So ROCE / ARR = 32,500 / 212,500 = 15.3%



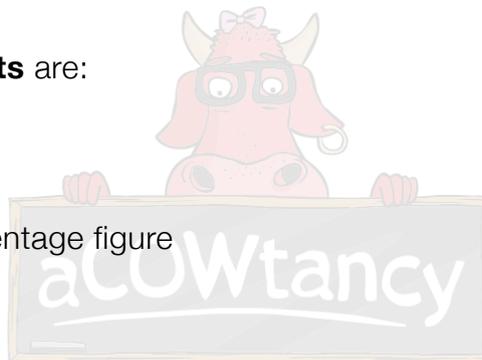
So how useful is this method?

The most damaging criticism of the accounting rate of return method is that it does not consider the time value of money. The simple rate of return method considers a dollar received 10 years from now as just as valuable as a dollar received today. Thus, the accounting rate of return method can be misleading if the alternatives being considered have different cash flow patterns.

Additionally, many projects do not have constant incremental revenues and expenses over their useful lives. As a result the simple rate of return will fluctuate from year to year, with the possibility that a project may appear to be desirable in some years and undesirable in other years. In contrast, the net present value method provides a single number that summarised all of the cash flows over the entire useful life of the project.

In summary the **benefits** are:

- fairly simple
- understandable percentage figure



Drawbacks

- it disregards the project life and when the cash flows actually come in.
- It focuses on profits not liquidity.
- it uses accounting profits (which can be manipulated) rather than cash.
- there is no mention of the actual gain made (just a percentage figure)

Net Present Value

If a company has 2 projects under consideration it should choose the one with the highest NPV.

All it does is take all the cashflows - discounts them for the time value of money - and adds them all together.

A positive NPV means the discounted cash inflows are higher than the outflows and so the investment should be undertaken

The key thing to understand here is that all cashflows are discounted. This means reduced, and they are discounted by the % that it costs the company to get the money to invest. (The cost of capital)

So therefore if all the cash inflows are reduced by the rate it costs the company to get the money to invest and yet it is still positive - then the company has got more than the cost. It has beaten the cost of capital - and so will be a profitable investment

It will actually increase the value of the business

All positive NPV projects should therefore be taken

NPV Proforma¹⁵

	0	1	2	3	4
Sales		x	x	x	x
Costs		(x)	(x)	(x)	(x)
Profit					
Tax		(x)	(x)	(x)	(x)
Capital Expense	(x)				
Scrap					x
WDA		x	x	x	x
Working capital	(x)	x	x	x	(x)
Discount Factor					

The Tax Effect

So in the above proforma you see the normal things - cash for sales, costs, capital expense and scrap - but you also have to find the cash for the tax

We do this for two things...

- 1) Tax on operating profits - this is easy just take the profits x tax rate
- 2) WDAs - writing down allowances or 'tax depreciation' - this is actually the tax RELIEF you get for spending on a capital item and is a positive cashflow

¹⁵ Dec 07 Q2

Tax on operating profits

Simply calculate the net profit figure and multiply by the tax rate. This is normally 30%.

Remember it is normally **payable one year later**. For example tax on year 1 profits is paid in year 2.

I showed it in the program as tax payable in the year just to make it easier to read - but watch out for what it tells you in the question

WDA

These **reduce** your tax bill!

They are the tax relief on your capital purchases.

These are normally 25% writing down allowances on plant & machinery



Calculation technique

- Calculate the amount of capital allowance claimed in each year
- Make a balancing adjustment in the year the asset is sold
- Calculate the tax saved ($30\% \times \text{WDA}$)

Illustration

Year 0 Buy plant 100

Year 4 Sell plant 20

25% Reducing balance; Tax 30%;

Answer

Year 1 WDA $100 \times 25\% = 25$ **Tax benefit 7.5**

Year 2 WDA $75 \times 25\% = 18.75$ **Tax benefit 5.625**

Year 3 WDA $56.25 \times 25\% = 14$ **Tax benefit 4.2**

Year 4 WDV 42.25

Sold for (20)

Balancing Allowance 22.25 **Tax benefit 6.675**



Working Capital

Think of this as like float in a restaurant. Each night in the restaurant represents a year.

So, lets say a float of 100 is needed at the start of the night (T0)

Then the following night an extra 20 is required.

The following night 30 more

The final night 10 less

At the end of the project it all comes back to the owner

	T0	T1	T2	T3	T4
Working capital	-100	-20	-30	10	140

So:

Technique

- 1) Always start at T0
- 2) Just account for increase or decrease
- 3) Final year it all comes back as income
- 4) The working capital line should come to zero when added across

Illustration

	0	1	2	3	4
Land & Buildings	2000				
F&F	500				
Revenue		600	800	1000	1200
COS		150	200	250	300
Overheads		100	100	100	100

Additional information:

20% of office overhead is an allocation of head office operating costs.

The cost of land and buildings includes a feasibility study which has already been paid of 100

The entity hope to sell the business at the end of year 4 for 1,500

Cost of capital is 10%

Tax is 30% and is payable one year after profits are earned

WDA on fittings and equipment at 25% on a reducing balance basis. None available on land and buildings.

Estimated resale proceeds of 100 for the fittings and equipment have been included in the total figure of 1,500 given above.

Working capital = 10% of next years sales

Answer

	0	1	2	3	4	5
Sales		600	800	1000	1200	
Costs		150	200	250	300	
Overhead		80	80	80	80	
Profit		370	520	670	820	
Tax			-111	-156	-201	-246
Capital Expense	-2,400					
Scrap					1500	
WDA			37.5	28	21	33.5
Working capital	-60	-20	-20	-20	120	
Discount Factor	0	0.909	0.826	0.751	0.68	0.621
	-2460	318	352	392	1537	-132

NPV = 7

WDA working

Yr 1 $500 \times 25\% \times 30\% = \mathbf{37.5}$

Yr 2 $37.5 \times 75\% = \mathbf{28}$

Yr 3 $28 \times 75\% = \mathbf{21}$

Asset effective cost = $(500 - 100) = 400$.

So WDA should be $400 \times 30\% = 120$, so extra **33.5**

NPV Benefits

- it considers the time value of money (that is in the discount rate used)
- it gives an absolute figure not a percentage
- it considers the whole life of the project
- is based on real cashflows.

It maximises the wealth of shareholders as this increases through receiving dividends and rising share prices.

Positive NPV investments should increase the market value of the company by the amount of the NPV.

A company with a market value of \$10 million investing in a project with an NPV of \$1 million will have a market value of \$11 million once the investment is made. Shareholder wealth is therefore increased

NPV method also contributes towards the objective of maximising the wealth of shareholders by using the cost of capital of a company as a discount rate when calculating the present values of future cash flows. A positive NPV represents an investment return that is greater than that required by a company's providers of finance, offering the possibility of increased dividends being paid to shareholders from future cash flows (see later)

NPV drawbacks

- is the reliance placed on the cost of capital - this can be tricky to calculate (as we shall see later)
- inflation rates for selling price and variable cost are assumed to be constant in future periods. In reality, interaction between a range of economic and other forces influencing selling price per unit and variable cost per unit will lead to unanticipated changes in both of these project variables
- it is heavily dependent on the production and sales volumes forecasts

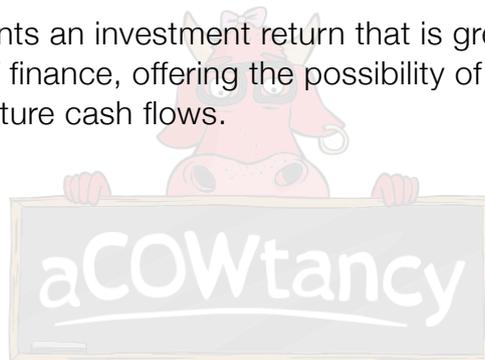
NPV and shareholder wealth maximisation¹⁶

The objective of maximising the wealth of shareholders is usually substituted by the objective of maximising the share price of a company.

If a company accepts an investment with a positive NPV, the market value of the company, theoretically at least, increases by the amount of the NPV. A company with a market value of \$10 million investing in a project with an NPV of \$1 million will have a market value of \$11 million once the investment is made.

Shareholder wealth will be maximised if a company invests in all projects with a positive NPV. This is sometimes referred to as the optimum investment schedule for a company.

A positive NPV represents an investment return that is greater than that required by a company's providers of finance, offering the possibility of increased dividends being paid to shareholders from future cash flows.



¹⁶ Jun 08 Q4

Internal Rate of Return

Let's say we do an NPV - discounting down at 10% - and the NPV is 100

Did we beat 10%? Yes

Now we discount the same NPV using 20% - and this time the NPV is -100

Did we beat 20%? No

So hopefully you can see the actual rate of return (or the internal rate of return) is somewhere between 10 and 20%

Now we discount it down at 15% and it comes to zero

Did we beat 15%? No it was exactly 15% - this is the IRR

So the IRR is the discount rate where the NPV = 0

To find out where NPV = 0, all we do is 2 NPV calculations at different rates - like the one above where I used 10% and 20% then apply this formula

nb. You can choose any rates not necessarily 10 and 20 - the result will be ALMOST the same

That formula is:

$$L + \frac{NPV L}{NPV L - NPV H} \times (H - L)$$

L= Lower discount rate

H = Higher discount rate

NPV L = NPV @ lower rate

NPV H = NPV @ higher rate

Illustration

So the illustration before I said at 10% NPV = 100, at 20% NPV = -100

What is the IRR?

Answer

$$10 + (100/200) \times (20-10) = 15 = 15\%$$

Advantages of IRR

- Considers the time value of money
- Easily understood percentage
- Uses cash not profits
- Considers whole life of project
- Increases shareholders wealth



Disadvantages of IRR

- Does not produce an absolute figure (percentage only)
- Interpolation of the formula means it is only an estimate
- Fairly complicated to calculate
- Non conventional cashflows can produce multiple IRRs

Syllabus D1g: Discuss the superiority of discounted cash flow (DCF) methods over non-DCF methods

Well the discounted ones take into account the time value of money.

But more than that they also take into account the cost of capital - which means the cost of getting the money for the investment from loans and shares

Therefore we know if we beat the cost of capital - we are getting our creditors and our shareholders more than what they require and so the value of our business will increase accordingly



The net present value (NPV) method has several important advantages over the internal rate of return (IRR) method.

First the net present value method is often simpler to use.

As mentioned earlier, the internal rate of return method may require hunting for the discount rate that results in a net present value of zero.

This can be a very laborious trial-and-error process, although it can be automated to some degree using a computer spreadsheet.

Second, a key assumption made by the internal rate of return (IRR) method is questionable.

Both methods assume that cash flows generated by a project during its useful life are immediately reinvested elsewhere.

However, the two methods make different assumptions concerning the rate of return that is earned on those cash flow.

The net present value method assumes the rate of return is the discount rate, whereas the internal rate of return method assumes the rate of return is the internal rate of return on the project.

Specifically, if the IRR of the project is high, this assumption may not be realistic.

It is generally more realistic to assume that cash inflows can be reinvested at a rate of return equal to the discount rate - particularly if the discount rate is the company's cost of capital or an opportunity rate of return.

For example, if the discount rate is the company's cost of capital, this rate of return can be actually realised by paying off the company's creditors and buying back the company's stock with cash flows from the project.

In short, when the net present value method and the internal rate of return method do not agree concerning the attractiveness of a project, it is best to go with the net present value method.

Of the two methods, it makes the more realistic assumption about the rate of return that can be earned on cash flows from the project.

Absolute v percentage figure

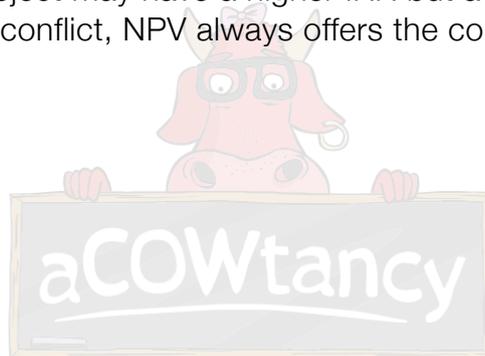
IRR has several weaknesses as a method of appraising capital investments.

Since it is a relative measurement of investment worth, it does not measure the absolute increase in company value (and therefore shareholder wealth), which can be found using the net present value (NPV) method

Mutually exclusive projects

There is a potential conflict between IRR and NPV in the evaluation of mutually exclusive projects, where the two methods can offer conflicting advice as which of two projects is preferable.

For example a small project may have a higher IRR but a lower NPV than a very big project. Where there is conflict, NPV always offers the correct investment advice



D2: Allowing for inflation and taxation in DCF

Syllabus D2a Apply and discuss the real-terms and nominal-terms approaches to investment appraisal

Inflation

An increase in prices. Therefore the real value of money will decline over time

Interest rate

The rate of return required by a lender

Let's say that inflation is 2%. If you have £100 now and don't spend it, the £100 won't be able to buy as much as it could at the start of the year because prices have increased by 2%.

Therefore to stop this fall in value, many people put the money in a bank. They may get an interest rate of say 5%. This would represent a return over and above the inflation rate.

Although the calculation ISN'T quite this straightforward (see later), basically if you get a 5% interest rate, and inflation is 2%, then you have received around a 3% return over and above the inflation rate. We call this rate the REAL return

Real Rate

The rate you want, not taking into account inflation (you want that on top of the real rate)

Money / Nominal return

The actual rate received which includes inflation. This is often the interest rate given.

Formula:

MONEY = REAL x INFLATION

$$1+m = (1+r) \times (1+inf)$$

Illustration

An investor wants a real return of 10%. Inflation is 5%

What is the MONEY/NOMINAL rate required?

$$1+m = (1+r) \times (1+inf)$$

$$1+m = 1.1 \times 1.05$$

$$m = .155 = 15.5\%$$

Illustration

If the real rate required is 6% and inflation is 3% - what is the money/nominal rate required?

$$1.06 \times 1.03 = 1.0918 = 9.18\%$$

Syllabus D2b: Calculate the taxation effects of relevant cash flows, including the tax benefits of tax allowable depreciation and the tax liabilities of taxable profit

We did this when looking at NPV

Syllabus D2c: Calculate and apply before- and after-tax discount rates

So if you use tax in your NPV (or other) calculations then the discount rate should also include tax

So if you are given a before-tax discount rate of 10% but your calculations that you are going to discount include tax - then you need to tax-adjust the 10% to make it an after tax rate

We do this by taking the before tax rate (say 30%) and multiplying it by 100-tax rate

So if the before tax rate was 10% the after tax-rate would be $10 \times (100-30\%) = 7\%$

If you don't use tax in your NPV then use a before tax rate to discount

D3: Adjusting for risk and uncertainty in investment appraisal

Syllabus D3a: Describe and discuss the difference between risk and uncertainty in relation to probabilities and increasing project life

Risk¹⁷

This is the variability of returns - so can be quantified

Uncertainty

Increases with project life - and cannot be quantified

Risk refers to the situation where probabilities can be assigned to a range of expected outcomes arising from an investment project and the likelihood of each outcome occurring can therefore be quantified

Uncertainty refers to the situation where probabilities cannot be assigned to expected outcomes.

Sensitivity analysis

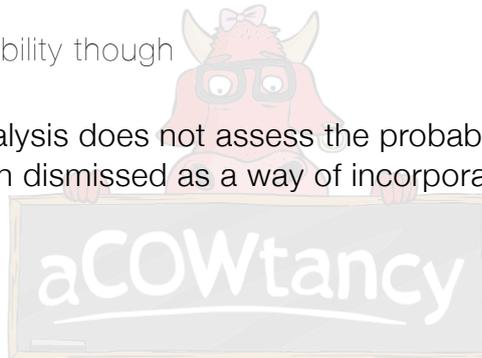
Change required to make NPV=0

SA looks at how the NPV will change as we change one variable in the NPV calculations. It looks how much that variable has to change as a % to make the NPV = 0 and therefore now not be worth going ahead

Therefore the smaller the % change needed in the variable (to make the NPV = 0 overall) makes the variable more sensitive and worrying / uncertain

Does not look at probability though

However, sensitivity analysis does not assess the probability of changes in project variables and so is often dismissed as a way of incorporating risk into the investment appraisal process.



Calculating Sensitivity margin

NPV of project

PV of item

(Expressed as a percentage)

Illustration

ACCA r US colleges are considering a project which will cost them an initial 10,000

The cashflows expected for the 2 year duration are 10,000pa. The variable costs are 1,000pa

Calculate the sensitivity analysis of all variables

Cost of capital 10%

Solution

PV of project as a whole:

Year	0	1	2
Investment	-10,000		
Costs		-1,000	-1,000
Sales		10,000	10,000
Discount		0.909	0.826
NPV	-10,000	8,181	7,434

So the NPV as a whole is 5,615



Sensitivity of Initial Investment

$$5,615 / 10,000 = 56\%$$

Sensitivity of Costs

$$5,615 / (909 + 826) = 323\%$$

Sensitivity of Sales

$$5,615 / (9,090 + 8,260) = 32\%$$

Weakness of Sensitivity Analysis

- Each variable must change in isolation. Yet they are often interdependent upon each other
- It does not take into account probabilities of change occurring
- Some factors management may not control



Probability analysis

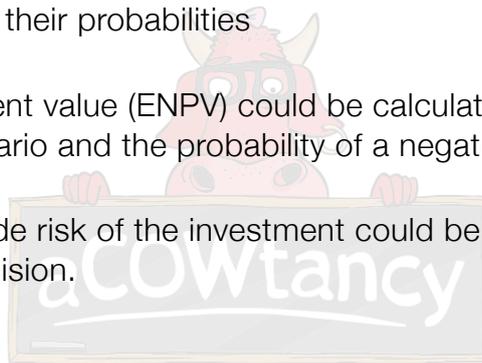
looks at the separate probabilities of different possible outcomes of an investment project.

For example, a range of different potential market conditions could be given a probability of each arising in future years

The net present values arising from combinations of these conditions could then be assessed and linked to their probabilities

The expected net present value (ENPV) could be calculated, together with the probability of the worst-case scenario and the probability of a negative net present value.

In this way, the downside risk of the investment could be determined and incorporated into the investment decision.



Calculating an EV

Formula

$$\sum px$$

P = probability and X = Value of outcome

It finds the the **long term** average outcome rather than the most likely outcome

Illustration

A new product cashflows will depend on whether a substitute comes onto the market or not

Chance of substitute coming in 30%

NPV if substitute comes in (10,000)

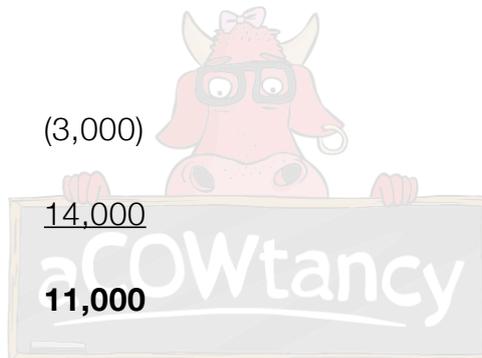
NPV with no substitute 20,000

Solution

$$30\% \times (10,000) = (3,000)$$

$$70\% \times 20,000 = 14,000$$

$$\mathbf{EV} = \mathbf{11,000}$$



Syllabus D3d: Apply and discuss other techniques of adjusting for risk and uncertainty in investment appraisal, including:

i) simulation

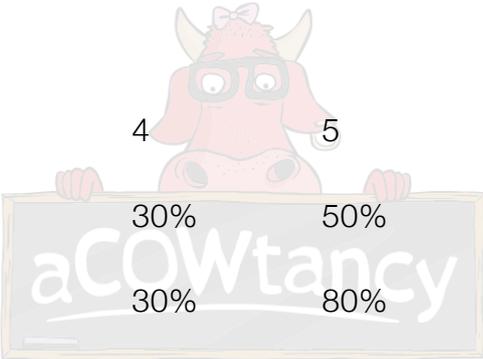
ii) adjusted payback

iii) risk-adjusted discount rates

Simulation

Looks at many variables changing at once

Illustration



Variable costs	4	5	6
Probability	30%	50%	20%
Cumulative probability	30%	80%	100%
Random number range	0-29	30-79	80-99

Random numbers represent the probability. So, 30 numbers are given to the 30% range, 50 to the 50% range etc.

A random number is generated - say 48

So NPV based on a variable cost of 5 is generated

This is repeated many times for all variables until we have a probability distribution

Advantages

Includes all possible outcomes

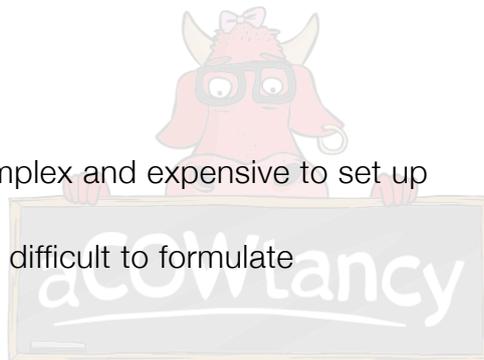
Easily understood

Wide variety of applications

Disadvantages

Model can become complex and expensive to set up

Probability distributions difficult to formulate



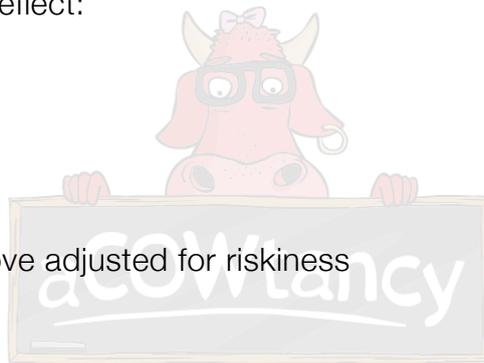
Adjusted Payback

Incorporates risk into the payback method we looked at earlier in the course

Risk Adjusted Discount Rates

Discount rates should reflect:

- 1) Cost of debt
- 2) Cost of equity
- 3) The mix of the 2 above adjusted for riskiness



If a project gives additional risks then the discount factor should be altered accordingly. This is called the **risk premium**

We will see this later in more detail

Syllabus D4: Specific investment decisions

Syllabus D4a: Evaluate leasing and borrowing to buy using the before-and after-tax costs of debt

LEASE or BUY?

Simply choose the one with the **lowest NPV** cost (as asset revenues will be the same for both methods)

Relevant costs

LEASE

Rental Payment

(Tax relief on these)



(WDAs)

*Unless the company does not pay tax - use the **after tax cost of borrowing***

= Interest rate x 70% (if tax is 30%)

Note that the cost of the loan should not include the interest repayments on the loan - as this is in the discount factor

Illustration

Machine cost \$6,400 (UEL 5 years)

Capital allowances 25% reducing balance

Finance choices

1) 5 year loan 11.4% pre tax cost

2) 5 year Finance Lease @ \$1,420 pa in advance

Solution

Year		WDA	Tax benefit	Timing
0	Cost	6,400		
1	WDA	1,600	480	2
2	WDA	1200	360	3
3	WDA	900	270	4
4	WDA	675	203	5
5	Balancing allowance	2,025	608	6

Post Tax borrowing

$$11.4\% \times 70\% = 7.98\% = 8\%$$

Option 1 - Buy with Loan

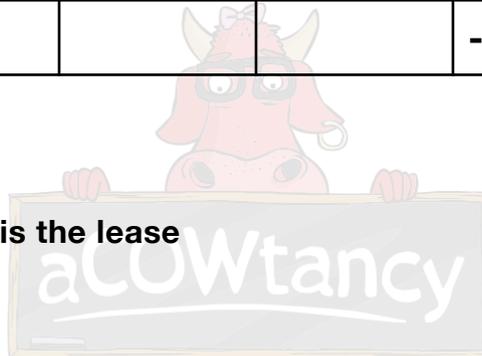
Time	0	1	2	3	4	5	6
Cost	-6400						
Tax benefit			480	360	270	203	608
DF	1	0.926	0.857	0.794	0.735	0.681	0.63
	-6400		411	286	198	138	383

NPV = (4,984)

Option 2 - Lease

		Cash	DF	PV
0-4	Lease Payments	-1,420	1+3.312	-6,123
2-6	Tax saving	426	4.623 - 0.926	1,575
				-4,548

The cheapest option is the lease



Leasing benefits in general

Allows company to get the asset if they can't get a bank loan

Some taxation benefits (Tax exhaustion)

Avoids regulations that other lending can give such as covenants etc

Operating Lease Features

Possibility of short term rental

No initial capital outlay

No risk of obsolescence

Often maintained & insured by the lessor

Off balance sheet finance

Can be expensive



Finance lease features

Long term rental

No need for initial capital outlay

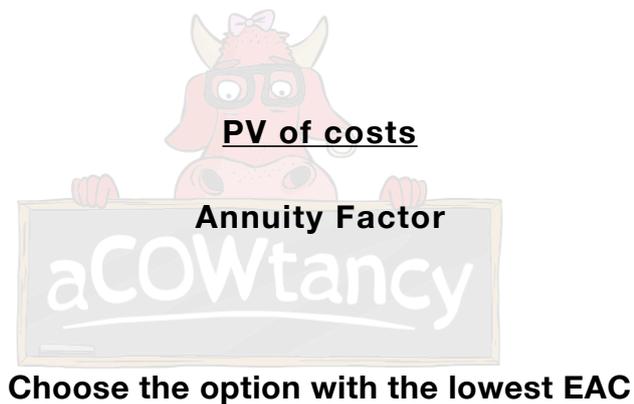
Simply an alternative source of finance

May be cheaper

Asset Replacement Decisions

Assets will need replacing but how often is best?

The different options open to us have different time scales so, in order to compare, we use an EAC (equivalent annual cost):



Steps:

- Calculate the PV of costs for all options
- Then the EAC
- Then choose the lowest

Key Assumptions

- Although the operating revenues are deemed to be the same, using **an older asset may not be as efficient**
- The assets are replaced in perpetuity

- Tax & Inflation ignored

Illustration

Machine Cost 20,000

Running costs

Year 1 5,000

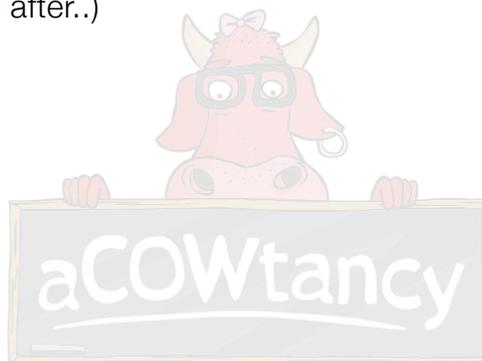
Year 2 5,500

Residual Value (if sold after..)

Year 1 16,000

Year 2 13,000

Cost of capital = 10%



Solution

Replaced every year

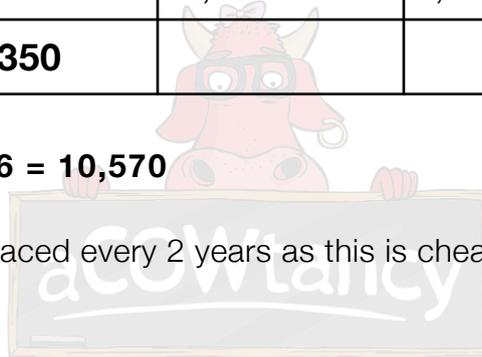
	0	1
Machine	-20,000	
Running Costs		-5,000
Residual Value		16,000
	-20,000	11,000
DF	1	0.909
PV	-20,000	9,999
NPV	-10,001	

$$\text{EAC} = 10,001 / 0.909 = 11,002$$

	0	1	2
Machine	-20,000		
Running Costs		-5,000	-5,500
Residual Value			13,000
	-20,000	-5,000	7,500
DF	1	0.909	0.826
PV	-20,000	-4,545	6,195
NPV	-18,350		

$$\text{EAC} = 18,350 / 1.736 = 10,570$$

Machine should be replaced every 2 years as this is cheaper



Syllabus D4c: Evaluate investment decisions under single- period capital rationing, including:

i) the calculation of profitability indexes for divisible investment projects

ii) the calculation of the NPV of combinations of non-divisible investment projects

iii) a discussion of the reasons for capital rationing

Single-period capital rationing

Shareholder wealth is maximised by taking on positive NVP projects.

However, capital is not always available to allow this to happen.

This means capital is being rationed.

When capital is rationed, the best investment schedule is the one that maximises the return per dollar invested.

Basically this is limiting factor analysis, but the approach adopted is slightly different depending on whether the investment projects being evaluated are divisible or indivisible.

There are two reasons for Capital Rationing:

Hard Capital rationing

Banks won't lend any more

why?

- Industry wide factor (recession?)
- Company has no/poor track record
- Company has no assets to secure the loan
- Poor management team

Soft Capital rationing

Company imposes its own spending restriction. (This goes against the concept of shareholder maximisation - which occurs by always investing in positive NPV projects)

why?

- Limited management skills
- Want to limit exposure and focus on profitability of small number of projects

The calculation of profitability indexes for divisible investment projects

the assumption with DIVISIBLE projects is that part (rather than the whole) of an investment can be undertaken, with the net present value (NPV) being proportional to the amount of capital invested.

If 70% of a project is undertaken, for example, its NPV is assumed to be 70% of the whole project NPV.

For each divisible project, a profitability index can be calculated, defined either as the net present value of the project divided by its initial investment, or as the present value of the future cash flows of the project divided by its initial investment.

The profitability index represents the return per dollar invested and can be used to rank the investment projects.

Concept

You should choose to do all of the most profitable project and part of the less profitable ones until all your capital is spent

Profitability Index model

To work out the profitability - you need to use the profitability index model (PI)

NPV of project

Investment cost

Illustration - Company has 100,000 to invest and has identified the following 5 projects. They are DIVISIBLE.

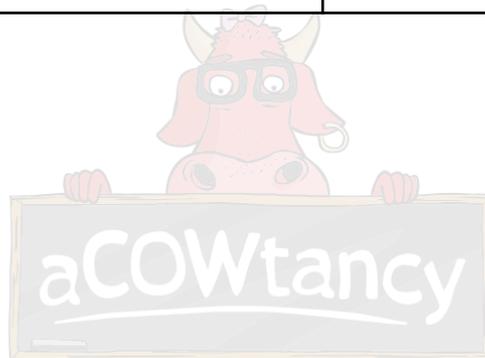
Project	Investment	NPV
A	40	20
B	100	35
C	50	24
D	60	18
E	50	-10

Solution

Project	Working	PI	Ranking
A	20/40	0.5	1
B	35/100	0.35	3
C	24/50	0.48	2
D	18/60	0.3	4
E	Who cares!		

Plan

Funds	Project	NPV
100,000		
-40,000	A	20,000
60,000		
-50,000	C	24,000
10,000		
-10,000	10% of B	3,500
		47,500



The calculation of the NPV of combinations of non-divisible investment projects

Ranking by profitability index will not necessarily indicate the optimum investment schedule here, since it will not be possible to invest in part of a project.

In this situation, the NPV of all possible combinations of projects must be calculated.

The combination of projects with the highest aggregate NPV will then be the optimum investment schedule.

We simply have to look at all the possible combinations which can be purchased with the capital available and work out which would be the most profitable.

Illustration - Company has 100,000 to invest and has identified the following 5 projects. They are NOT DIVISIBLE.

Project	Investment	NPV
A	40	20
B	100	35
C	50	24
D	60	18

Solution

Alternatives	Investment	NPV
A+C	90	44
A+D	100	38
B	100	35

A+C is the best mix

Syllabus E: BUSINESS FINANCE

Syllabus E1: Sources of and raising business finance

Syllabus E1a: Identify and discuss the range of short-term sources of finance available to businesses, including:

i) overdraft

ii) short-term loan

iii) trade credit

iv) lease finance



Short term finance

Overdraft - this is the riskiest type of finance as the bank can call it in at any time, however in F9 it is also the cheapest

Short term Loan - Less risky than an overdraft but it will need replacing possibly and there's a risk that it would be on worse terms - if the economy changes

Trade Credit - Often seen as free finance - although you may actually be missing out on early settlement discounts. Be careful also not to annoy your creditors by taking too long to pay

Leasing - Leases as a source of finance¹⁸

¹⁸ Dec 07 3d

Protection against obsolescence

Operating leasing offers a solution to the obsolescence problem

Where keeping up-to-date with the latest technology is essential for business operations, operating leasing provides equipment on short-term contracts which can usually be cancelled without penalty to the lessee.

In-built maintenance

Operating leasing can also provide access to skilled maintenance, which might otherwise need to be bought in by the lessee, although there will be a charge for this service.

Good when borrowing is difficult

It provides access to non-current assets even when the company lacks assets to offer as security, or it may be seen as too risky to lend to.

Since ownership of the leased asset remains with the lessor, it can be retrieved if lease rental payments are not forthcoming.

Less commitment than a loan

There is no need to arrange a loan in order to acquire an asset and so the commitment to interest payments can be avoided, existing assets need not be tied up as security and negative effects on return on capital employed can be avoided

Cheaper than a loan

By taking advantage of bulk buying, tax benefits etc the lessor can pass on some of these to the lessee in the form of lower lease rentals, making operating leasing a more attractive proposition than borrowing.

Off balance sheet finance

Operating leases also have the attraction of being off-balance sheet financing, in that the finance used to acquire use of the leased asset does not appear in the balance sheet.

Syllabus E1b: Identify and discuss the range of long-term sources of finance available to businesses, including:

i) equity finance

ii) debt finance

iii) lease finance

iv) venture capital

Long term finance

Finance Lease - looked at earlier in the course

Bank loans and bonds/debentures - Traded bonds raise cash which must be repaid usually between 5 and 15 years after issue.

Bonds are usually secured on non-current assets thus reducing risk to the lender.

Interest paid on the bonds is tax-deductible, thus reducing the cost of debt to the issuing company

Equity Financing - via a placing - does not need to be redeemed, since ordinary shares are truly permanent finance.

The return to shareholders in the form of dividends depends on the dividend decision made by the directors of a company, and so these returns can increase, decrease or be passed.

Dividends are not tax-deductible like interest payments, and so equity finance is not tax-efficient like debt finance.

Equity - see below

Preference Shares - These are seen as a form of debt in F9

Venture Capital - Venture capital is found in specific financing situations, i.e. where risk finance is needed, for example, in a management buyout.

Both equity and debt finance can be part of a venture capital financing package, but the return expected on venture capital is very high because of the level of risk faced by the investor.

Factors to consider when choosing a source of debt finance

Cost

Both issue costs and the interest rate plus any possible early repayment penalties.

Maturity

The period should match the period the cash is needed for

Financial risk

Debt will increase gearing and hence the financial risk

How will the company be viewed from a risk perspective by future investors?

Availability

This depends on the size of the company, its relationship with its bank and the capital markets to which it has access.

Factors to be considered by providers of finance

Risk and the ability to meet financial obligations

The previous record of the company can be used as a guide to the ability of its board of directors to manage its finances in a responsible and effective manner.

Business plans will be looked at to ensure its based on reasonable assumptions

Security

Debt investors will expect security in order to reduce the risk of the investment from their point of view.

If security is not available or is limited, the company will have to pay a higher interest rate

Legal restrictions on borrowing

For example in existing debt contracts, or in the company's memorandum or articles of association.



Syllabus E1c: Identify and discuss methods of raising equity finance, including:

i) rights issue

ii) placing

iii) public offer

iv) stock exchange listing

Equity as Finance

Rights Issue	For existing shareholders initially	No dilution of control
Placing	Fixed price to institutional investors	Low cost - good for small issues
Public	Underwritten & advertised	Expensive - good for large issue

Rights Issue - here you offer new shares to existing shareholders in proportion to the number of shares they currently hold.

So, current shareholders have the *right* to be offered new shares before they are offered to new investors, hence the term '*rights issue*'.

There are some factors to consider.

Issue price

Rights issues shares are offered at a discount to the market value. It can be difficult to judge what the amount of the discount should be.

Relative cost

Rights issues are cheaper than other methods of raising finance by issuing new equity, such as an initial public offer (IPO) or a placing, due to the lower transactions costs associated with rights issues.

Ownership and control

As the new shares are being offered to existing shareholders, there is no dilution of ownership and control, providing shareholders take up their rights.

Gearing and financial risk

Issuing shares decrease gearing and financial risk. The shareholders of the company may see this as a positive move, depending on their individual risk preference positions

Rights Issues¹⁹

A 1 for 2 at \$4 (MV \$6) right issue means....

The current shareholders are being offered 1 share for \$4, for every 2 they already own. (The market value of those they already own are currently \$6)

Calculation of TERP (Theoretical ex- rights price)

The current shareholders will, after the rights issue, hold:

$$1 @ \$4 = \$4$$

$$2 @ \$6 = \$12$$

So, they now own a total of 3 for a total of \$16. So the TERP is $\$16/3 = \5.33

Effect on EPS

Obviously this will fall as there are now more shares in issue than before, and the company has not received full MV for them

To calculate the exact effect simply multiply the current EPS by the TERP / Market value before the rights issue

¹⁹ Jun 09 Q4b

Eg Using the above illustration

EPS x 5.33 / 6

Effect on shareholders wealth

There is no effect on shareholders wealth after a rights issue. This is because, although the share price has fallen, they have proportionately more shares

Equity issues such as a rights issue do not require security and involve no loss of control for the shareholders who take up the right



Islamic Financing

Syllabus E1 di: Identify and discuss methods of raising short and long term Islamic finance including major difference between Islamic finance and the other forms of business finance.

Islamic financial instruments require that an active role be played by the provider of funds, so that the risks and rewards of ownership are shared.

Syllabus E1 di i) The concept of riba (interest) and how returns are made by Islamic financial securities

Interest (riba) is the predetermined amount received by a provider of finance, over and above the principal amount of finance provided.

Riba is absolutely forbidden in Islamic finance.

For the borrower, riba can turn a profit into a loss when profitability is low.

For the lender, riba can provide an inadequate return when unanticipated inflation arises.

For the economy, riba can lead to allocational inefficiency, directing economic resources to sub-optimal investments.

Syllabus E1 diii) Islamic financial instruments available to businesses including

i) murabaha (trade credit)

ii) ijara (lease finance)

iii) mudaraba equity finance)

iv) sukuk (debt finance)

v) musharaka (venture capital)

In a Mudaraba contract, profits are shared between the partners in the proportions agreed in the contract, while losses are borne by the provider of finance.

In a Musharaka contract, profits are shared between the partners in the proportions agreed in the contract, while losses are shared between the partners according to their capital contributions.

With Sukuk, certificates are issued which are linked to an underlying tangible asset and which also transfer the risk and rewards of ownership. The underlying asset is managed on behalf of the Sukuk holders.

In a Murabaha contract, payment by the buyer is made on a deferred or instalment basis. Returns are made by the supplier as a mark-up is paid by the buyer in exchange for the right to pay after the delivery date.

In an Ijara contract, which is equivalent to a lease agreement, returns are made through the payment of fixed or variable lease rental payments.

Syllabus E1e: Identify and discuss internal sources of finance,

including:

i) retained earnings

ii) increasing working capital management efficiency

iii) the relationship between dividend policy and the financing decision

iv) the theoretical approaches to, and the practical influences on, the dividend decision, including legal constraints, liquidity, shareholding expectations and alternatives to cash dividends

Retained Earnings

This is using money to invest, that hasn't been given away in dividends

Advantages

- 1) Flexible - no specific repayment terms or amounts needed
- 2) No loss of control

Disadvantages

- 1) Shareholders may be annoyed at a loss of dividends
- 2) The investment needs to beat the cost of equity as shareholders could have invested their dividends elsewhere

Better Working Capital Management

This means taking longer to pay creditors - just be careful not to annoy them and don't forget the possible loss of early settlement discounts

it also means getting debtors to pay earlier which may mean a lack of competitiveness and also a cost of offering early settlement discounts

It also means less time in stock which may mean running the risk of stock-outs

Dividend Policy

As we saw above - if we don't give away dividends we can invest the money. The reverse is true if we do give away dividends then we need to get the money to invest from elsewhere - thus it affects our financing policy

The question is - is it better to pay dividends and get finance from elsewhere or keep dividends low and use that money for investments

Here are some theories:

The Residual theory of dividends

Here companies just pay dividends after all investments have been funded.

This, therefore, presumes that these internal funds are cheaper than external financing

Target Payout ratio

Here companies have a fixed long term ratio they try to uphold e.g. 40% of earnings

Mature companies tend to have higher payout ratios because they have more stable earnings

Dividends as a Signal theory

An increase in dividends may be a good signal to investors that they are doing well and have more cash than usual, however it may be a bad signal as it shows that they have no use for this extra cash i.e.. no profitable investments to make

A decrease in dividends may be a good signal because it shows that the money is being invested for the future or a bad signal in that they are struggling to maintain the dividend due to poor earnings

Clientele Theory

Here companies just do what their shareholders wish.

Meaning that some companies have a reputation for high dividends and so look to maintain that as their shareholders probably bought the shares for the high dividends

Alternatively, but in the same vein, some companies have very low dividends, preferring to invest the money and see the share price increase. Their shareholders would expect and want this. They can then sell their shares at a higher price (if they wish) and create a dividend for themselves that way - sometimes called a 'home-made' dividend

In both cases the company will wish to maintain their high or low policy so as not to upset their current shareholders

Dividends and Taxes

It may be that taxes on dividends are different to taxes on selling shares. Therefore the company may offer the shareholders whichever is the most tax efficient

So offer low dividends if capital gains tax is less than the tax on dividend income and vice-versa

Dividends are Irrelevant Theory

Here Modigliani and Miller argue that dividends make no difference (ignoring tax).

They say that it is not dividends that affect a company value but rather its investments.

The financing makes no difference - if the money comes from inside the firm then the shareholders lose their dividends but gain from not having to pay the new shareholder finance costs.

Equally if they take the dividend, they enjoy the dividend but then have to pay the costs of the new shareholders who would be needed

Legal restrictions

The final thing that affects the amount of dividends to give away may be something legal. For example not being able to give away dividends if there is not sufficient retained earnings

Types of Dividend

- 1) **Cash dividend** - the most common. This will depend on the liquidity though of the company - do they have the actual spare cash
- 2) **Share Split / scrip dividends** - this is a dividend in the form of shares, so the number of shares increase but no cash changes hands. This is good for liquidity and reduces transaction costs for shareholders who want more shares.
- 3) **Share repurchase** - Here the firm buys the shares back off its shareholders - which may be beneficial for tax

It is worth noting that all dividends have the effect of reducing the share price - what we call the ex-div share price



Syllabus E2: Estimating the cost of capital

Syllabus E2a i: Estimate the cost of equity including.. Application of the dividend growth model and discussion of its weaknesses

Cost of Equity - DVM Model

This is the “Dividend Valuation Model” technique to valuing cost of equity

It is calculated as follows:

$$\text{(Dividend just paid + growth / Share Price) + growth}$$

Dividend just paid + growth.

Well, the dividend just paid, is what we call the dividend paid at T0. Dividend plus growth means the dividend paid at the end of year 1, or one year later (T1).

So the formula could read “Dividend next year” instead of “Dividend just paid + growth”

ILLUSTRATION

A company has an ex-div share price of £4 and a dividend just paid of £1. Growth in dividends is 10%. What is the cost of equity?

$$= \text{£1} \times 1.10 = \underline{\text{£1.10}}$$

$$\text{£4}$$

$$= 27.5\%. \text{ So Cost of equity} = 27.5\% + 10\% = 37.5\%$$

Weakness of the DVM

- Future dividend patterns will probably not be constant. They are not always based on past dividends but on inflation, economic conditions etc.
- The growth in earnings are ignored and yet these directly affect the company's ability to pay dividends.
- The current share price can be subject to other influences such as takeover bids



Cost of Equity - Using CAPM

This method also looks at the cost of equity (like dvm) but looks more closely at the shareholder's risk rather than return. The more risk a shareholder takes, the more return he will want, so the cost of equity will increase.

For example, a shareholder looking at a new investment in a different business area may have a different risk.

The model assumes a well diversified (see later) investor. It suggests that the required rate of return (cost of equity) will be the risk free return + any risk premium associated with that particular investment.



Risk free **Risk premium**

for that share

$$\text{Required Return} = R_f + \beta(R_m - R_f)$$

R_m = Average return for the whole market

$R_m - R_f$ = Average market risk premium

Beta (β) = How much of the average market risk premium ($R_m - R_f$) is needed

More technically Beta (β) = Systematic risk of the investment compared to the market

Advantages

- The relationship between risk and return is market based
- Correctly looks at systematic risk only
- Good for appraising specific projects and works well in practice

Disadvantages

- It presumes a well diversified investor. Others, including managers and employees may well want to know about the unsystematic risk also
- The return level is only seen as important not the way in which it is given. For example dividends and capital gains have different tax treatments which may be more or less beneficial to individuals.
- It focuses on one period only.
- Some inputs are very difficult to get hold of. For example beta needs a subjective analysis
- Generally CAPM overstates the required return for high beta shares and visa versa

DVM or CAPM?

The dividend growth model allows the cost of equity to be calculated using empirical values readily available for listed companies. Measure the dividends, estimate their growth (usually based on historical growth), and measure the market value of the share (though some care is needed as share values are often very volatile). Put these amounts into the formula and you have an estimate of the cost of equity.

However, the model gives no explanation as to why different shares have different costs of equity. Why might one share have a cost of equity of 15% and another of 20%?

The reason that different shares have different rates of return is that they have different risks, but this is not made explicit by the dividend growth model. That model simply measures what's there without offering an explanation. Note particularly that a business cannot alter its cost of equity by changing its dividends. The equation:

$$r_e = \frac{D_0(1 + g)}{P_0} + g$$

P₀

might suggest that the rate of return would be lowered if the company reduced its dividends or the growth rate. That is not so. All that would happen is that a cut in dividends or dividend growth rate would cause the market value of the company to fall to a level where investors obtain the return they require.

The CAPM explains why different companies give different returns. It states that the required return is based on other returns available in the economy (the risk free and the market returns) and the systematic risk of the investment – its beta value.

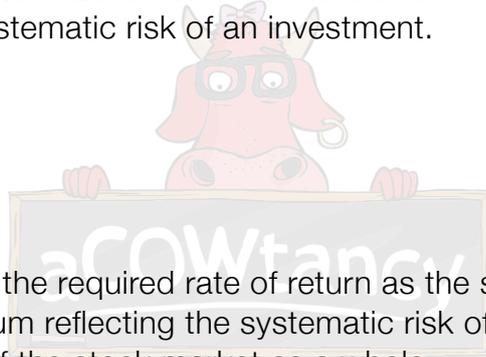
Not only does CAPM offer this explanation, it also offers ways of measuring the data needed. The risk free rate and market returns can be estimated from economic data. So too can the beta values of listed companies.

When an investment and the market is in equilibrium, prices should have been adjusted and should have settled down so that the return predicted by CAPM is the same as the return that is measured by the dividend growth model.

Note also that both of these approaches give you the cost of equity. They do not give you the weighted average cost of capital other than in the very special circumstances when a company has only equity in its capital structure.

The dividend growth model has several difficulties. For example,

- it impractically assumes that the future dividend growth rate is constant. The dividend decision depends on past trends but also current conditions.
- The historic dividend growth rate is used as a substitute for the future dividend growth rate. The model also assumes that business risk, and the cost of equity, are constant in future periods, but reality shows us that companies are subject to constant change.
- The dividend growth model does not consider risk explicitly in the same way as the CAPM. Here, all investors are assumed to hold diversified portfolios and as a result only seek return for the systematic risk of an investment.



The CAPM represents the required rate of return as the sum of the risk-free rate of return and a risk premium reflecting the systematic risk of an individual company relative to the systematic risk of the stock market as a whole.

This risk premium is the product of the company's equity beta and the equity risk premium. The CAPM therefore tells us what the cost of equity should be, given an individual company's level of systematic risk.

The individual components of the CAPM are found by empirical research and so the CAPM gives rise to a much smaller degree of uncertainty than that attached to the future dividend growth rate in the dividend growth model.

For this reason, it is usually suggested that the CAPM offers a better estimate of the cost of equity than the dividend growth model.

Systematic risk

is caused by general economic factors. All companies, though, do not have the same systematic risk as some are affected more or less than others by external economic factors

So it is a market wide risk - such as state of the economy

Beta (β) = Systematic risk of the investment compared to the market

How risky is the specific investment compared to the market as a whole?

This is the 'beta' of the investment (β).

If β is 1, the investment has the same risk as the market overall.

If $\beta > 1$, the investment is riskier (more volatile) than the market and investors should demand a higher return than the market return to compensate for the additional risk.

If $\beta < 1$, the investment is less risky than the market and investors would be satisfied with a lower return than the market return.

Illustration

Risk free rate = 5%; Market return = 14%

What returns should be required from investments whose beta values are:

(i) 1 (ii) 2 (iii) 0.5

Solution:

Cost of Equity = $R_f + \beta (R_m - R_f)$

(i) = $5 + 1(14 - 5) = 14\%$

The return required from an investment with the same risk as the market, which is simply the market return.

$$(ii) \quad = 5 + 2(14 - 5) = 23\%$$

The return required from an investment with twice the risk as the market. A higher return than that given by the market is therefore required.

$$(iii) \quad = 5 + 0.5(14 - 5) = 9.5\%$$

The return required from an investment with half the risk as the market. A lower return than that given by the market is therefore required.

Non Systematic Risk

Risk that is unique to a certain asset or company. An example of nonsystematic risk is the possibility of poor earnings or a strike amongst a company's employees.

One may mitigate nonsystematic risk by buying different securities in the same industry or different industries. For example, a particular oil company has the diversifiable risk that it may drill little or no oil in a given year. An investor may mitigate this risk by investing in several different oil companies as well as in companies having nothing to do with oil.

Nonsystematic risk is also called diversifiable risk.

Portfolio theory

Beta represents the riskiness of the share in comparison to the market - its called systematic risk.

If a portfolio of shares is ALL the shares on the stock market then it will have a beta of 1

if the portfolio has only RISK FREE shares then it will have a beta of 0

So the investor needs to decide how much beta she wants in her portfolio

So if she wants to be riskier than the market (and hence have a potential better return) then her portfolio should have a beta of more than 1

So above 1 means that if the market rises by say 10%, then your portfolio should rise by more than 10%. However also, if the market falls by 10%, your portfolio will fall by more than 10%

Therefore, in a bear (falling) market - portfolio theory suggests you should buy shares with a beta of less than 1

And in bull (rising) market - portfolio theory suggest you should buy shares with a beta of more than 1

Cost of Debt

Syllabus E2b: Estimating the cost of debt

i) irredeemable debt

ii) redeemable debt

iii) convertible debt

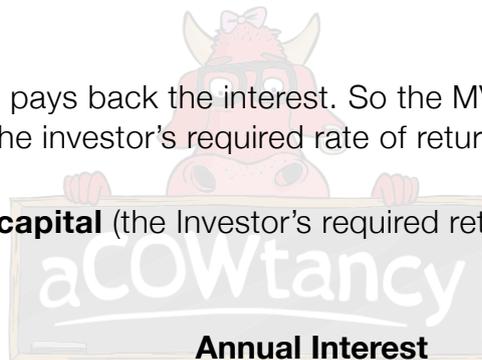
iv) preference shares

v) bank debt

Irredeemable debt

Here, the company just pays back the interest. So the MV should just be all the expected interest discounted at the investor's required rate of return.

Therefore, the **cost of capital** (the Investor's required return) can be calculated as follows:



Market Value

Redeemable debt²⁰

The company now pays the interest **and** the original amount (capital) back. So the MV is the interest and capital discounted at the investor's required rate of return.

Remember the cost of capital to the company is the investor's required rate of return. (Tax plays a part here as we shall see later)

To calculate this in an exam an IRR calculation is required as follows:

²⁰ Dec 08 Q4b

- 1) Guess the cost of capital is 10% or 15% and calculate the present value of the capital and interest. Compare this to the correct MV
- 2) Now do the same but guess at 5%
- 3) Use the IRR formula to calculate the actual cost of capital

Illustration

5 years 12% redeemable debt. MV is 107.59

Time		Cash	5%	PV	15%	PV
1-5	Interest	12	4.329	51.95	3.352	40.22
5	Capital	100	0.784	78.4	0.497	49.7
	MV			-107.59		-107.59
				22.76		-17.67

$$\text{IRR} = 5\% + (22.76 / 22.76 + 17.67) \times 10\% (15 - 5) = 10.63\%$$

The Tax Effect

Tax reduces the cost of capital to a company because interest payments are tax deductible.

It was ignored in the last example, but let's say that that tax was 30%, then the actual interest cost was not 12 but $12 \times 70\% = 8.40$

Simply take the interest figure and multiply it by $1 - \text{tax rate}\%$.

Illustration

20% Redeemable debt. Tax 30%. What is the interest charge to be used in a cost of capital calculation for a company?

$$20\% \times 70\% = 14\%$$

Now let's rework that last example but this time use 10% as a guess and let's assume tax of 30%

Time		Cash	5%	PV	10%	PV
1-5	Interest	8.4	4.329	36.36	3.791	31.84
5	Capital	100	0.784	78.4	0.621	62.1
	MV			-107.59		-107.59
				7.17		-13.65

$$IRR = 5\% + (7.17 / 7.17 + 13.65) \times 5\% (10-5) = 6.72\%$$

The cost of capital is lower than the original example as tax effectively reduces the cost to the company as interest is a tax deductible expense.

Convertible Debt

Here the investor has the choice to either be paid in cash or take shares from the company. Hence, the debt is convertible into shares.

To calculate the cost of capital here, simply follow the same rules as for redeemable debt **(an IRR calculation)**.

The only difference is that the 'capital' figure is the higher of:

- Cash payable
- Future share payable

Illustration

8% Convertible debt. Redeemable in 5 years at:

Cash 5% premium or

20 shares per loan note (current MV 4 and expected to grow at 7%)

The MV is currently 85. Tax 30%.



Time		Cash	5%	PV	10%	PV
1-5	Interest	5.6	4.329	24.24	3.791	21.23
5	Capital	112.2	0.784	87.96	0.621	69.68
	MV			-85		-85
				27.2		5.91

$$\text{IRR} = 5\% + (27.2 / 27.2 - 5.91) \times 5\% (10-5) = 11.4\%$$

Note:

$$1) \text{ Interest} = 100 \times 8\% \times 70\% (\text{tax adj}) = 5.6$$

Annual Dividend

Market Value

Illustration

50,000 8% preference shares. MV 1.20. What is the cost of capital for these?

$$(8\% \times 50,000) / (50,000 \times 1.2) = 6.67\%$$

Bank Debt

The cost of capital is simply the interest charged. Do not forget to adjust for tax though if applicable.

Illustration

\$1,000,000 10% Loan. Tax 30%. What is the cost of debt?

7%

Syllabus E2c: Estimating the overall cost of capital including:

i) *Distinguishing between average and marginal cost of capital*

If a company gets a specific loan or equity to finance a specific project then this loan/equity cost is the MARGINAL cost of capital.

If a company is continuously raising funds for many projects then the combined cost of all of these is the AVERAGE cost of capital.

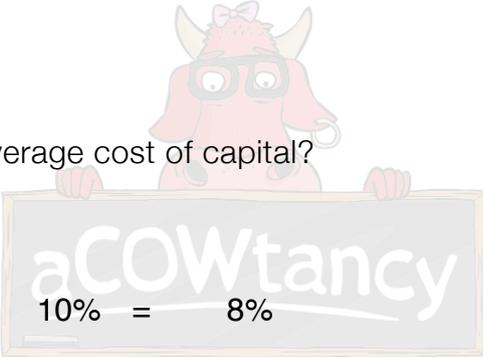
Always use the **AVERAGE** cost of capital in exam questions.

Syllabus E2c ii) Calculating the weighted average cost of capital (WACC) using book value and market value weightings

Consider a company funded as follows:

Type	Amount	Cost of Capital
Equity	80%	10%
Debt	20%	8%

What is the weighted average cost of capital?



Equity	80%	x	10%	=	8%
Debt	20%	x	8%	=	<u>1.6%</u>

WACC **9.6%**

What we have ignored here is how the 'amount' of equity and debt was calculated - using book or market values?

Use MV where possible

Illustration

Statement of Financial Position

Ordinary Shares		2,000
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Reserves		3,000
10% Loan		1,000

Ordinary shares MV = 3.75; Loan note MV 80;

Equity cost of capital = 20%

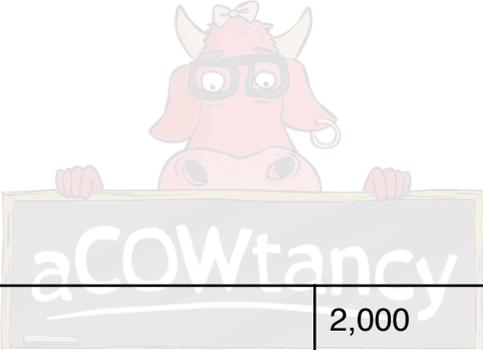
Debt cost of capital = 7.5% (after tax)

Calculate WACC using

- Book Values
- Market Values

Solution

Using Book Values:



Ordinary Shares		2,000
Reserves		3,000
		5,000
10% Loan		1,000
		6,000

$$\text{Equity} \quad 5,000/6,000 \times 20\% = 16.67\%$$

$$\text{Debt} \quad 1,000/6,000 \times 7.5\% = \underline{1.25\%}$$

$$\text{WACC} \quad \mathbf{17.92\%}$$

Using Market Values:

Ordinary Shares	2,000 x 3.75	7500
Reserves	Ignore (no MV)	0
		7,500
10% Loan	1,000 x 80/100	800
		8,300

Equity $7,500/8,300 \times 20\% = 18.07\%$

Debt $800/8,300 \times 7.5\% = 0.72\%$

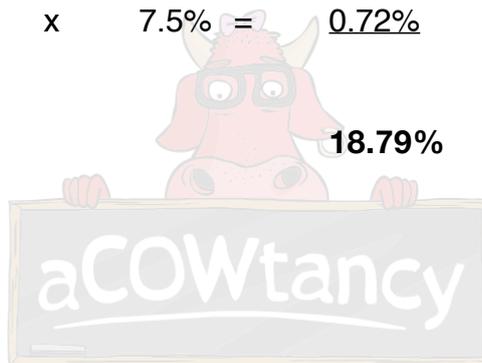
WACC

18.79%

SUMMARY

To Calculate WACC

- Calculate weighting of each source of capital (as above)
- Calculate each individual cost of capital
- Multiply through and add up (as above)



Syllabus E3: Sources of finance and their relative costs

Syllabus E3a: Describe the relative risk-return relationship and the relative costs of equity and debt

Basically the more risk you take, the more return you expect. This risk is the likelihood of actual returns varying from forecast.

The cost of capital represents the return required by the investors. These investors could be debt or share holders (debt and equity).

The return for the investors needs to be at least as much as what they can get from government gilts (these are seen as being risk free). On top of this they would like a return to cover the extra risk of giving the firm their investment.

The cost of capital is made up of the cost of debt + cost of equity.

The cost of normal debt is cheaper than the cost of equity to the company. This is because interest on debt is paid out before dividends on shares are paid. Therefore the debt holders are taking less risk than equity holders and so expect less return.

Also debt is normally secured so again less risk is taken.

Debt v Equity²¹

Gearing and financial risk

Equity finance will decrease gearing and financial risk, while debt finance will increase them

Target capital structure

The aim is to minimise weighted average cost of capital (WACC).

In practical terms this can be achieved by having some debt in capital structure, since debt is relatively cheaper than equity, while avoiding the extremes of too little gearing

²¹ June 08 Q2e

(WACC can be decreased further) or too much gearing (the company suffers from the costs of financial distress)

Availability of security

Debt will usually need to be secured on assets by either a fixed charge (on specific assets) or a floating charge (on a specified class of assets).

Economic expectations

If buoyant economic conditions and increasing profitability expected in the future, fixed interest debt commitments are more attractive than when difficult trading conditions lie ahead.

Control issues

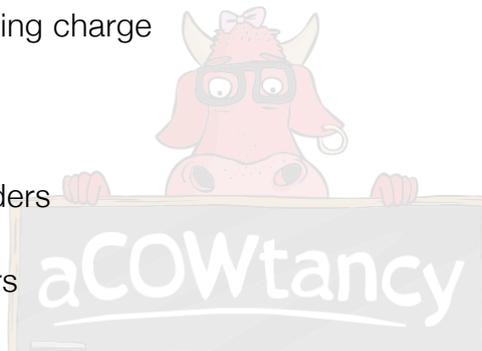
A rights issue will not dilute existing patterns of ownership and control, unlike an issue of shares to new investors.



Creditor hierarchy

When a company cannot pay its debts and goes into liquidation, it must pay its creditors in the following order:

1. Creditors with a fixed charge
2. Creditors with a floating charge
3. Unsecured creditors
4. Preference shareholders
5. Ordinary shareholders



Therefore the further down the list you go - the more risk is taken by the providers of finance

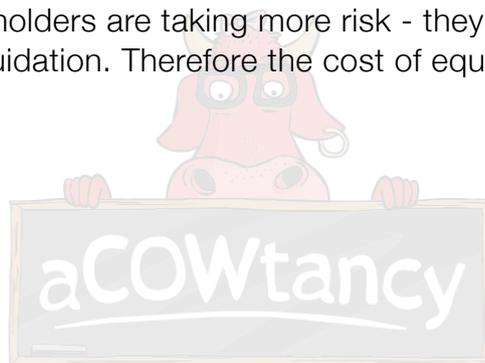
As they are taking more risk - then generally their costs of capital will be higher

High gearing basically means a lot more debt than equity in the balance sheet

This means you have more interest (which has to be paid) - and more repayments which need to be paid at some point in the future

This causes problems...

- 1) It will be more costly to get more debt (as the new debt providers are taking more risk)
- 2) The current shareholders are taking more risk - they get paid after debt holders - when there's a liquidation. Therefore the cost of equity will rise



Syllabus E3d: Assess the impact of sources of finance on financial position, financial risk and shareholder wealth using appropriate measures, including:

i) ratio analysis using statement of financial position gearing, operational and financial gearing, interest coverage ratio and other relevant ratios

ii) cash flow forecasting

iii) leasing or borrowing to buy

The things to look here for are primarily the levels of debt in comparison to equity

The higher levels of debt (relative to equity) means higher levels of financial gearing - this affects the volatility of EPS and also can increase cost of capital and so financial risk

Earnings are needed to pay interest (check the interest cover ratio), but also cash is needed to pay off the loans as they become due

Companies with high gearing then should not ideally look for more debt and therefore would be wiser to lease rather than borrow to buy.

Operational gearing looks at the amount of fixed overheads you have compared to variable. the higher the fixed costs the higher the operational gearing

High operational gearing makes a company very open to falls in revenue causing a huge drop in profits - and conversely a rise in revenue can increase profits hugely

Syllabus E3ei: Impact of cost of capital on investments including.

i) the relationship between company value and cost of capital.

if a company has a low cost of capital, it will have higher NPVs

A positive NPV of 100 will increase the value of a company by 100

So, the lower the cost of capital the higher the value of a company

Syllabus F3e ii) the circumstances under which WACC can be used in investment appraisal

WACC can be used to appraise an investment when:

- The project is relatively small
- The existing capital structure (debt to equity) will be maintained
- The project has the same business risk

Ungearing & Regearing

The betas we have been looking at so far are called Equity Betas

These represent

- 1) Business Risk
- 2) Our Financial Risk (Our gearing)

If we are looking to invest into a different industry we need to use a different beta, one which represents:

- 1) Business Risk (of new industry)
- 2) Financial Risk (Ours still as we are using our debt and/or equity)

To do this - follow these 2 simple steps

Step 1

Take the equity beta of a business in the target industry. Remember, this will represent their business risk and their financial risk (gearing). We only want their business risk. So we need to take out the financial risk - this is called ungearing

$$\text{Business equity beta} \times \text{Equity} / (\text{Equity} + \text{Debt})$$

This will leave us with business risk only (asset beta)

Step 2

Take this asset beta and regear it using our gearing ratio as follows:

$$\text{Asset Beta} \times (\text{Equity} + \text{Debt}) / \text{Equity}$$

Remember Debt is tax deductible

Illustration

Main company Proxy company

Equity beta 1.1

1.4

Gearing 2 : 5

1 : 4

Tax = 30%

Find the appropriate beta for the main company to use in its CAPM for investing in an industry different to its own but the same as the proxy company

STEP 1

Ungear the β of the proxy company:

$$= 1.4 \times 4/4.7 = 1.1915$$

STEP 2

Regear the β :

$$\beta_g = 1.1915 \times (5 + 2(1 - 0.3))/5 \\ = 1.525$$



Illustration

XYZ plc, a food retailing company, has an equity beta of 0.5 and a gearing level, measured as the market value of debt to equity, of 1:5.

It is trying to decide whether or not to invest in a construction project. It has identified a quoted company that undertakes similar operations to the project in question. The construction company has an equity beta of 1.2 and a gearing level of 1:3.

Corporation tax is 35 per cent.

The equity beta of the quoted construction company is appropriate for establishing a risk-adjusted discount rate for project appraisal, but must first be modified to reflect XYZ plc's gearing level.

Step 1 : Ungear the Beta of the proxy company

$$1.2 \times 3 / 3.65 = 0.99$$

Step 2:. Regear the asset beta to XYZ plc gearing level.

$$0.99 \times 5.65 / 5 = 1.12$$



Syllabus E4: Capital structure theories and practical considerations

Syllabus E4a: Describe the traditional view of capital structure and its assumptions²²

The traditional view of capital structure states that when a company starts to borrow, this extra debt is cheaper and will cause the WACC to fall

However, as gearing increases, shareholders increase their required return (i.e., the cost of equity rises). This is because there is more interest to be paid before they get their dividends.

At high gearing the cost of debt also rises because the chance of the company defaulting on the debt is higher (i.e., bankruptcy risk). So at higher gearing, the WACC will increase.

The main problem with the traditional view is that there is no underlying theory to show where the lowest WACC is

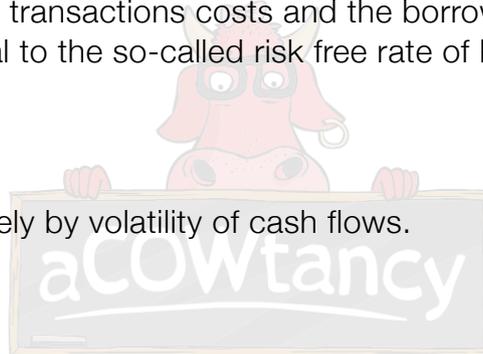
In this traditional view the WACC is a U-shaped curve

²² PP Q1b

In contrast to the traditional view, **Modigliani and Miller (MM)** claim that when a company borrows more the WACC shouldn't change at all. So instead of a U shaped curve the WACC should be a straight line as debt increases

In order to demonstrate a workable theory, MMs 1958 paper made a number of simplifying assumptions:

- the capital market is perfect;
- there are therefore no transactions costs and the borrowing rate is the same as the lending rate and equal to the so-called risk free rate of borrowing;
- taxation is ignored
- risk is measured entirely by volatility of cash flows.



Debt or Equity - it doesn't matter

If the capital market is perfect, MM argue, then all companies with the same business risk and the same expected annual earnings should have the same total value, regardless of capital structure, because the value of a company should depend on the present value of its operations, not on the way it is financed.

The WACC will be the same

It follows from this that if all such companies have the same expected earnings and the same value, they must also have the same WACC, regardless of capital structure, because WACC is simply the rate of return that links earnings with value. Hence, for any individual company, WACC will be the same at all levels of gearing. In other words, there is no optimal level of gearing and no minimum WACC one capital structure is as good as another.

Assumption Problems

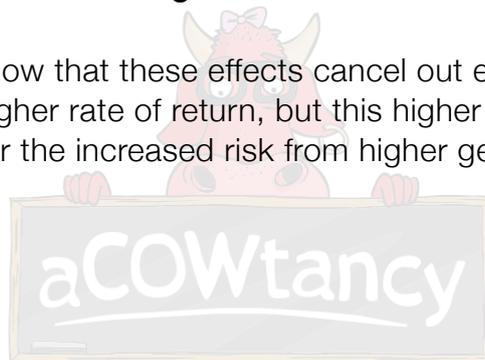
It is assumed there is no **taxation**: this is a serious problem because one of the key advantages of debt is the tax relief on interest payments.

Risk in Modigliani and Millers theory is measured entirely by variability of cash flows. They ignore the possibility that cash flows might cease because of bankruptcy. This is another significant problem for the theory if borrowing is high.

Making these assumptions means there is only one advantage of borrowing (debt is cheaper because it is less risky to the investor) and one disadvantage (the cost of equity increases with borrowing because of financial leverage).

Debt Advantages and disadvantages cancel out at all levels

Modigliani and Miller show that these effects cancel out exactly. The use of cheap debt gives shareholders a higher rate of return, but this higher return is precisely what they need to compensate for the increased risk from higher gearing



Taxation

Modigliani (1963) and Miller (1977) addressed the issue more specifically, showing that under some conditions, **the optimal capital structure should be complete debt finance** due to the preferential tax treatment of debt compared to equity

Therefore the graph would now show a sloping downwards line as more debt is introduced

Perfect Markets

Since in a perfect capital market the possibility of bankruptcy risk does not arise, the WACC is constant at all gearing levels and the market value of the company is also constant. Miller and Modigliani showed, therefore, that the market value of a company depends on its business risk alone, and not on its financial risk.

However, a perfect capital market is not available in the real world and at high levels of gearing the tax shield offered by interest payments is more than offset by the effects of bankruptcy risk and other costs associated with the need to service large amounts of debt.

This simply suggests that firms do not look for an optimum capital structure rather they raise funds as follows:

- Internally generated funds
- Debt
- New share issue

This is because internally generated funds have no issue costs and needs no time and effort in persuading others.

Debt is better accepted by the markets than looking for cash via a share issue which can seem desperate. Issue costs moderate.

Debt finance may also be preferred when a company has not yet reached its optimal capital structure and it is mainly financed by equity, which is expensive compared to debt.

Issuing debt here will lead to a reduction in the WACC and hence an increase in the market value of the company.

One reason why debt is cheaper than equity is that debt is higher in the creditor hierarchy than equity, since ordinary shareholders are paid out last in the event of liquidation.

Debt is even cheaper if it is secured on assets of the company. The cost of debt is reduced even further by the tax efficiency of debt, since interest payments are an allowable deduction in arriving at taxable profit.

²³ Dec 08 Q4a

Debt finance may be preferred where the maturity of the debt can be matched to the expected life of the investment project.

Equity finance is permanent finance and so may be preferred for investment projects with long lives.



Syllabus E5: Finance for small and medium sized entities (SMEs)

Syllabus E5a) Describe the financing needs of small businesses

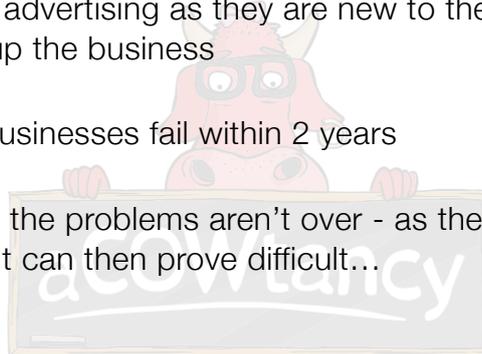
SMEs need cash to fund their working capital.

They often have very little credit offered to them but have to offer credit to customers to be competitive

They also need to fund advertising as they are new to the market and fund initial capital expenditure of setting up the business

Not surprisingly most businesses fail within 2 years

Even after the 2 years - the problems aren't over - as then they need to fund growth and getting more investment can then prove difficult...



Syllabus E5b) Describe the nature of the financing problem for small businesses in terms of the funding gap, the maturity gap and inadequate security

SMEs can struggle to raise finance due to:

few proper financial control systems

inexperienced management teams

no established track record

lacking sufficient good quality assets to offer as security

The funding gap

SMEs tend to be unquoted, so investors struggle to sell their shares easily - hence leaving SMEs with less options to get funding - so they turn to retained earnings, rights issues and bank borrowings

Even rights issues are difficult as the original shareholders are probably friends and family!

Then bank borrowing can also be tricky, due to the SMEs poor credit rating - meaning the SMEs need more business plans and additional security. Banks will also monitor their investment more closely.

So therefore, a funding gap often arises when they want to expand beyond these means of finance but are not yet ready for a listing on the Stock Exchange or Alternative Investment Market (AIM).

So SMEs may turn to business angels (see below) and the following...

Venture Capitalists

Most major providers of finance have specialist 'venture capital funds'.

They provide capital - often up to 5 years for start ups and high growth companies - in return for an equity stake

However they don't often invest under £100k in the UK, so for smaller amounts - a business angel is needed

Banks

With little security and banks being risk averse - often guarantees over the loan are needed

Government solutions

Governments have adopted a two-pronged response to increasing the attractiveness of SMEs:

- increasing marketability of shares
- tax incentives for investors.

In addition they have provided specific assistance in a range of areas (see below).

Making shares marketable

The development of small firm markets, such as the AIM in the UK and the Growth Enterprise Market (GEM) in Hong Kong, is designed to bridge this funding gap and provide both a venue for further fund-raising for SMEs

Syllabus E5d) Identify and evaluate the financial impact of sources of finance for SMEs, including sources already referred to in syllabus section E1 and also

i) Business angel financing

Business angels are wealthy individuals who invest in start ups (and early growth businesses), and get shares in the start up.

This is therefore a high risk for an angel and so high returns are needed - meaning it can be expensive for the SME also ultimately

Most investments are around £25,000 so they fill the gap between venture capitalists and debt finance. They offer expertise and further funding as the company grows

ii) Government assistance

Governments can encourage new businesses by guaranteeing loans for SMEs with insufficient security - although the SME will pay a premium for this

Governments can also offer grants (for example for employing staff in certain industries and regions). There is also the possibility of small start up loans and tax incentives

iii) Supply chain financing

This simply means taking credit from suppliers – typically 30 days. This is very helpful to new businesses.

Typically, suppliers to new businesses will want some sort of reference, either from a bank or from other suppliers (trade references). However, some will be prepared to offer modest credit initially without references, and as trust grows this can be increased.

iv) Crowdfunding / peer-to-peer funding

This has become increasingly popular in recent years - where SMEs take advantage of the the internet to reach many individuals who individually couldn't provide sufficient funding but as a whole, together can

Companies show their products, their business plans and latest financials online and potential small investors can then decide whether to invest or not

Often a minimum level needs to be reached before the investment goes ahead

Syllabus F: BUSINESS VALUATIONS

F1. Nature and purpose of the valuation of business and financial assets

Syllabus F1a: Identify and discuss reasons for valuing businesses and financial assets

Quoted Companies

When there's a takeover - the purchasers need to value the shares - which will need to be in excess of the current share price (a takeover premium)

Unquoted Companies

When going public - they need to fix an issue price for a share

When shares are sold

When there's a merger

When shares are being used as security for a loan

When being liquidated



Syllabus F1b: Identify information requirements for valuation and discuss the limitations of different types of information

Financial statements - although these are past looking and quickly out of date

Non current asset listing - these ideally need to be market values not original costs

Debtors and Creditors summaries - aged appropriately

Inventory summary - again market values would be useful

Details of contracts - e.g.. leases

Budgets and Projections - although the validity of the assumptions used is hard to calculate



F2. Models for the valuation of shares

Syllabus F2a: Discuss and apply asset-based valuation models, including:

i) net book value (statement of financial position) basis.

ii) net realisable value basis.

iii) net replacement cost basis

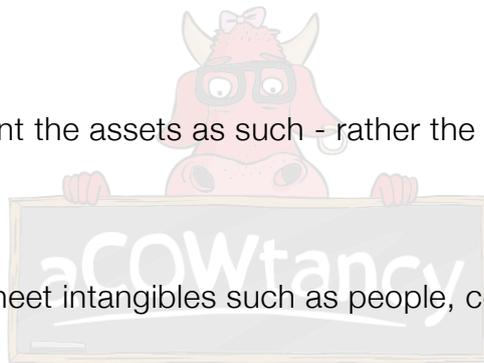
Asset Based Valuations

Problem No.1

A company doesn't want the assets as such - rather the income they produce

Problem No.2

It ignores off balance sheet intangibles such as people, company position and branding



When is using asset values a good technique then?

- When looking to asset strip the company
- As a minimum price
- When valuing Investment companies

NB Minimum price is normally market cap + acq premium

Measure	Strength	Weakness
Book Values	-	Uses historic costs
NRV	Minimum accepted	Difficult to value if quick sale
Replacement Cost	Maximum to spend on assets alone	Valuation difficult - need similar aged assets value Ignores goodwill

Illustration

NCA 450

Current Assets 150

Current Liabilities (50)

Share Capital (\$1) 200

Reserves 250

6% Loan 100



1) Loan is redeemable at 2% premium

2) MV of property is \$30,000 more than carrying value

What is the value of an 80% holding using assets basis?

Solution

NCA $450 + 30 = 480$

CA 150

CL (50)

Loan payable (102)

478

X 80% = **382,400**



Syllabus F2b: Discuss and apply income-based valuation models, including:

i) price/earnings ratio method.

ii) earnings yield method

Income Based Methods

Best used when:

- Getting control
- More interested in earnings than dividend policy

Price Earnings Method²⁴



The PE ratio of a company shows the CURRENT number of times the business value is compared to the earnings

or - on an individual share basis - the current number of times the share value is compared to the earnings per share

PE ratio

Share Price / EPS

Share Price

EPS x PE

²⁴ Dec 07 Q1a; Jun 08 Q2; Dec 08 Q1b

To Value a different business using PE ratio

1) PE x EPS x Number of shares

2) PE x (PAT - pref Divs)

NOTE: The PE ratio (when trying to value a business) is an appropriate one, perhaps based on a company in a similar industry, rather than its own

NB The PE can be adjusted down by 10%

- If private company (as less liquid shares)
- If risky company (fewer controls etc)

Illustration

Share Capital (25c) \$100,000

Profit Before tax 260,000

Tax (120,000)

PAT 140,000

Preference div (20,000)

Ordinary Div (36,000)

Retained 84,000

PE (for similar company) = 12.5

Value 200,000 shares?



Solution

Value of Company

PE x (PAT - Pref divs)

Total Earnings (of 200,000 shares)

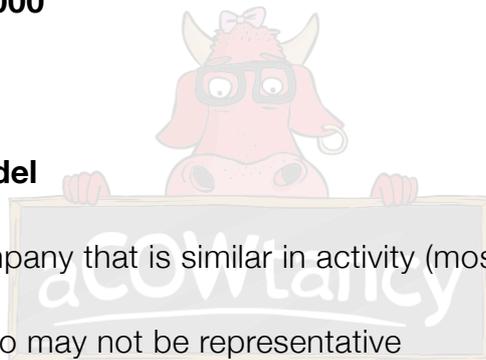
$$140,000 - 20,000 = 120,000 \times 200/400 = 60,000$$

PE 12.5

$$60,000 \times 12.5 = \mathbf{\$750,000}$$

Drawbacks Of PE model

- Finding a quoted company that is similar in activity (most have a wide range)
- A single year's PE ratio may not be representative
- The quoted company used to get the PE ratio from may have a totally different capital structure



Earnings Yield

(Inverse of PE ratio!)

EPS

Share Price

Value of Company

Total Earnings x 1/Earnings yield

(PAT - Pref div)

Share Price

EPS x 1/Earnings yield



Illustration

PAT 300,000; Earnings yield 12.5%

Solution

$300,000 \times 1/0.125 = \$2,400,000$

Syllabus F2c: Discuss and apply cash flow-based valuation models, including:

i) dividend valuation model and the dividend growth model.

ii) discounted cash flow basis

Cashflow Based Methods

Dividend Valuation Model²⁵

We saw DVM before when calculating cost of equity - here it is again in its more normal format - trying to value a share (and hence a business)

DVM can be with or without growth. What this means is that the share price can be calculated assuming a growth in dividends or not

Essentially this model presumes that a share price is the PV of all future dividends. Calculate this (with or without growth) and multiply it by the total number of shares

It is similar to market capitalisation except it doesn't use the market share price, rather one worked out using DVM

²⁵ Dec 07 Q1a; Jun 08 Q2a

DVM (without growth)

The share price is calculated like this:

Constant Dividend (from yr 1 to infinity)

Cost of Equity (decimal)

Cost of Equity will be given, or calculated via CAPM. Take this share price and multiply it by the number of shares

DVM with growth



Cost of equity - growth (all as decimal)

Or

Dividend next year (1+g)

Cost of Equity - growth (decimal)

Illustration

Share Capital (50c) \$2 million

Dividend per share (just paid) 24c; Dividend paid four years ago 15.25c

Current market return = 15%

Risk free rate = 8%

Equity beta 0.8

Solution

Dividend is growing so use DVM with growth model:

Calculate Growth

Growth not given so have to calculate by extrapolating past dividends as before:

$25/15.25$ sq root to power of 4 = 1.12 = 12%

So Dividend at end of year 1 = 24×1.12

Calculate Cost of Equity (using CAPM)

Calculate using CAPM as not given

$8 + 0.8 (15-8) = 13.6\%$

Share price = $24 \times 1.12 / 0.136 - 0.12 = 1,680c$

Market cap = $\$16.8 \times (2m / 0.5) = \67.2

Discounted Cashflow basis

Value of company (equity)

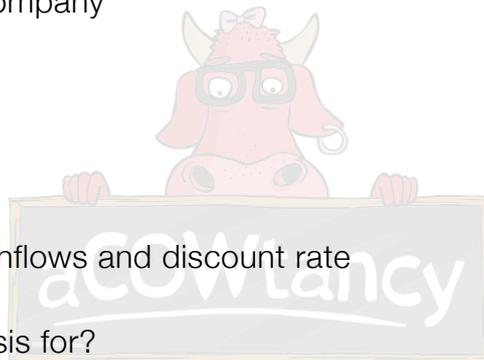
PV of future cashflows - value of debt

Advantages

- Theoretically best method
- Can value part of a company

Weaknesses

- Need to estimate cashflows and discount rate
- How long is PV analysis for?
- Assumes constant tax, inflation and discount rate



Illustration

PBT 80 (all cash)

Capital Investment each year 48

Debt 10 (\$120)

Tax = 30%

WACC = 16.6%

Inflation = 6%

This is expected to continue for foreseeable future (perpetuity)



Solution

Cash inflow $80 \times 70\% = 56 - 48 = 8$ (in perpetuity)

Use real rate - $1.166 / 1.06 = 10\%$

Value = $8 / 0.1 = 80\text{m}$

Equity = $80\text{m} - (10 \times 1.2) = 68\text{m}$

F3: The valuation of debt and other financial assets

Syllabus F3a: Discuss and apply appropriate valuation methods.

To value a redeemable debt you need to do the following:

- 1) Take the capital and the interest payments
- 2) Discount them down at the cost of debt

Illustration

2,000 3 years 6% redeemable loan 10% premium - cost of debt 10%

Solution



Cashflows		Discount @ 10%	
Capital	110	0.751	82.61
Interest	6	0.909	5.454
	6	0.826	4.956
	6	0.751	4.506
			97.526

Note:

Capital is always 100 - unless there's a premium or its a convertible loan (use the FV of the shares if higher than 100)

The interest above I ignored tax as it wasn't mentioned in the scenario

If tax is mentioned you have a choice:

- 1) Tax adjust the interest and use the after tax cost of debt
- 2) Don't tax adjust the interest and use the before tax cost of debt

F4: Efficient Market Hypothesis (EMH) and practical considerations in the valuation of shares

Syllabus F4a: Distinguish between and discuss weak form efficiency, semi-strong form efficiency and strong form efficiency

Stock market efficiency usually refers to the way in which the prices of traded financial securities reflect relevant information.

Weak Form

Share prices fully and fairly reflect past information only

Investors cannot generate abnormal returns by analysing past information as there is no correlation between share price movements over time

Share prices appear to follow a 'random walk' by responding to new information as it becomes available.

Semi strong

Share prices fully and fairly reflect past and current public information

Investors cannot generate abnormal returns by analysing public information as share prices respond quickly and accurately to new information as it becomes publicly available.

Strong form

Share prices fully and fairly reflect not only public and past information, but private information as well, a stock market is described as strong form efficient

Even investors with access to insider information cannot generate abnormal returns in such a market.

Testing for strong form efficiency is indirect in nature, examining for example the performance of expert analysts such as fund managers.

Stock markets are not held to be strong form efficient.

The significance to a listed company of its shares being traded on a stock market which is found to be semi-strong form efficient is that any information relating to the company is quickly and accurately reflected in its share price.

Managers will not be able to deceive the market by the timing or presentation of new information, such as annual reports or analysts' briefings, since the market processes the information quickly and accurately to produce fair prices.

Managers should therefore simply concentrate on making financial decisions which increase the wealth of shareholders.

Syllabus F4b: Discuss practical considerations in the valuation of shares and businesses, including:

i) marketability and liquidity of shares

For shares without a stock exchange quoting - this means it's difficult for an investor to sell their shares.

This means that these shares aren't as valuable as quoted ones

ii) availability and sources of information

Some information will be verified by 3rd parties such as audited accounts, however budgets and projections will necessarily be subjective

Also not all plans can be made publicly available due to competition being able to see them

iii) market imperfections and pricing anomalies

When using PE to value a share it can be difficult to find a similar company, because quoted companies often have a far higher range of diversification

iv) market capitalisation

This is the market value of a share x number of shares

The market price though is subject to outside economic conditions and also to potential takeover bids etc so it may not represent the true fair value of a share

For a while, evidence suggested that CAPM, EMH etc explained things well.

However, as time went on, academics found behaviours that couldn't be explained by these theories. The real world proved to be a very messy place in which market participants often behaved very unpredictably.

For example, many buy lottery tickets, despite the odds of them winning FAR outweighing the potential return

Behavioural finance tries to help explain this, using cognitive psychology

It suggests that sometimes shares may be overvalued due to the number of people interested in the share - making it seem more attractive and thus, irrationally, more valuable

Another anomaly is that the market premium is historically 6-7%, compared to only 3% for bonds. However shares are not that much riskier - so why such a return premium?

The answer, according to behavioural finance, is that humans are much more highly tuned to losses. This loss aversion means the market must return very high premiums to overcome any short term losses

Another example is anchoring. This means an investor anchors the "value" of a share to its recent amounts. Lets say that a share was trading at \$100 but loses a key customer and thus falls to \$50.

An investor though may now, incorrectly, see this share as undervalued because he is anchored as seeing this share so high before

Syllabus G: RISK MANAGEMENT

G1. The nature and types of risk and approaches to risk management

Syllabus G1a: Describe and discuss different types of foreign currency risk:

- i) *translation risk*
- ii) *transaction risk*
- iii) *economic risk*

Types of foreign currency risk

Translation

Risk that there will be losses when a subsidiary is translated into the parent company currency when doing consolidated accounts

Transaction

Risk of exchange rates moving against you when buying and selling on credit, between the transaction date and actual payment date

Economic

Long term cashflow risk caused by exchange rate movements.

For example a UK exporter will struggle if sterling appreciated against the euro. It is like a long term transaction risk

Syllabus G1b: Describe and discuss different types of interest rate risk:

- i) *gap exposure*
 - ii) *basis risk*
-

Gap Exposure - Lets say you have some receivable loans (at variable rates) and some payable loans (at variable rates). Ideally these would match each other and you wouldn't worry about the interest rates

However if they mature at different times, you are for going to be 'exposed' for a period - and this may be good news (positive gap) or bad news (negative gap)

Positive Gap - the interest bearing assets are greater than the interest paying liabilities maturing

Negative Gap - more interest sensitive liabilities within the period



Basis Risk - This time lets presume that our variable rate receivable and payable loans are perfectly matched (in size and maturity). Therefore there is no gap exposure.

However the rates they pay may be different - as they may be BASED on different things - for example one is based on LIBOR and the other not

It means they may be the same now but in the future they may not move in line with each other

G2: Causes of exchange rate differences and interest rate fluctuations

Terminology first!

Spot rate = Current exchange rate

Forward rate = Future rate set now

If you are going abroad and wish to get foreign foreign currency before you go - then the local bank will SELL you it

When you return - with some foreign money in your pocket which you wish to exchange back into home currency - the bank will BUY it off you

We say the bank buys and sells in terms of the counter currency. The bank always SELLS LOW and BUYS HIGH

\$1.8:£ Here the BASE currency is £ and the counter is \$

£0.7:\$ Here the BASE currency is \$ and the counter is £

The BASE currency stays the same whilst the counter fluctuates against it

Syllabus G2a & b: Describe the causes of exchange rate fluctuations, including:

i) balance of payments

ii) purchasing power parity theory

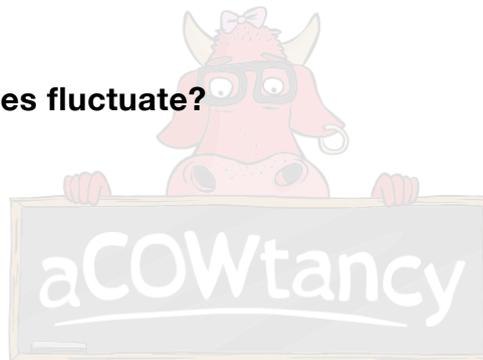
iii) interest rate parity theory

iv) four-way equivalence

Purchasing Power Parity (PPP theory)

Why do exchange rates fluctuate?

“The law of one price”



Illustration

Item costs \$1,000 in US and €500 in Malta

\$2:€ (base)

However inflation in US is 5% and Malta 3%

Solution

So next year - Item in US costs \$1,050 and in Malta €515

“The law of one price” states $\$1,050 = €515$

So, forward exchange rate will be $1,050 / 515 = \$2.039:€1$

This can be shown more easily by the following PPPT formula:

Spot rate x 1+ Inf (counter) / 1 + inf (base) = Predicted rate

$$2 \quad \times \quad 1.05 \quad / \quad 1.03 \quad = \quad \mathbf{2.039}$$

Limitations

- Future inflation is an estimate
- Market is ruled by speculative not trade transactions
- Governments often intervene



Interest Rate Parity (IRP theory)

Why do exchange rates fluctuate?

An investor will get the same amount of money back no matter where he deposits his money

Illustration

Investor has \$1,000 to invest for 1 year; US Interest rate = 10%

Malta Interest rate = 8%

Exchange rate = \$2:€

Solution

In US he will receive \$1,100 in one year's time

In Malta he will receive €540

Forward rate will therefore be $1,100 / 540 = \mathbf{\$2.037:€}$

Future exchange rate calculation

Exchange rate now $\times 1 + \text{Int (counter)} / 1 + \text{int (base)}$

$$2 \quad \times \quad 1.10 \quad / \quad 1.08 = \mathbf{2.037}$$

Limitations

- Government intervention
- Controls on currency trading



Syllabus G2c: Describe the causes of interest rate fluctuations, including:

i) structure of interest rates and yield curves

ii) expectations theory

iii) liquidity preference theory

iv) market segmentation

Yield Curves (Return to debt holder)

Normal

Long term loans - higher yields (more risk)

Inverted

Longer term loans - Less yield (upcoming recession)

Flat

Yields are same for short and long term loans

The shape of the curve depends on:

- Liquidity preference
- Expectations
- Market segmentation

Liquidity Preference Theory

Investors want their cash back quickly therefore charge more for long term loans which tie up their cash for longer and thus expose it to more risk

Expectation Theory

Interest rates rise (like inflation) - so longer term more charged

NB. Recession expected means less inflation and less interest rates so producing an inverted curve

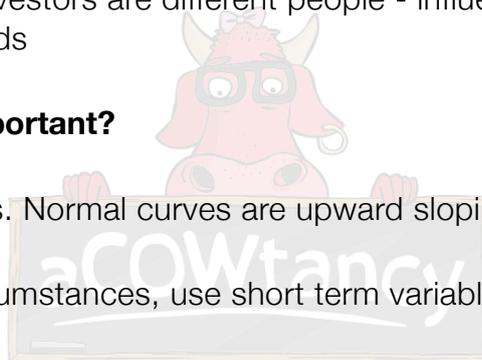
Market Segmentation Theory

Long and short term investors are different people - influenced by different factors. Eg banks and pension funds

Why is yield curve important?

It predicts interest rates. Normal curves are upward sloping.

Therefore, in these circumstances, use short term variable rate borrowing and long term fixed rate.



G3: Hedging techniques for foreign currency risk

Syllabus G3a & b: Discuss and apply traditional and basic methods of foreign currency risk management, including:

i) currency of invoice

ii) netting and matching

iii) leading and lagging

iv) forward exchange contracts

v) money market hedging

vi) asset and liability management

Options to manage these risks



- 1) **Only deal in home currency!** (commercially acceptable?)
- 2) **Matching** - Use foreign currency bank account - so matching receipts with payments then risk is against the net balance
- 3) **Leading** - Receive early (offer discount) - expecting rate to depreciate
- 4) **Lagging** - Pay later if currency is depreciating
- 5) **Assets & Liabilities** - interest bearing ones - ensure they are of similar size, rates and maturity

Another way of managing the risk is using:

Forward Rates²⁶

Simply agreeing a future rate now. Therefore fixing yourself in against any possible future losses caused by movements in the real exchange rate

However - you also lose out if the actual exchange rate moves in your favour as you have fixed yourself in at a forward rate already

Illustration:

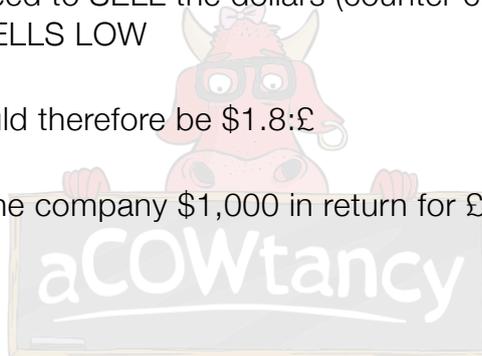
UK company has to pay \$1,000 in a months time

It takes the forward rate of \$1.8-1.9:£

The bank then has agreed to SELL the dollars (counter currency) to the company. Remember the bank SELLS LOW

The exchange rate would therefore be \$1.8:£

So, the bank will give the company \$1,000 in return for £555. The company must pay £555



²⁶ PP Q2c

Money Market hedging

Hedging a Payment

The foreign payment is in the future, we are going to get some foreign currency NOW to pay for it. The reason for this is we can therefore take advantage of the rate now

We do not need the full amount payable now though, as we can put the foreign money into a foreign deposit account to earn just enough interest to make the full payment when ready

We, therefore, calculate how much is needed now by taking the full amount and discounting it down at the foreign deposit rate

Now we know how much foreign currency we need NOW, we can convert that into home currency using the spot rate

We now know how much home currency we need. This needs to be borrowed. So, the cost to us will eventually be:

Amount of home currency borrowed + interest on that until payment is made. (Obviously here we use the home borrowing rate)

Steps:

- 1) Calculate how much foreign currency needed (discount @ foreign deposit rate)
- 2) Convert that to home currency
- 3) Borrow that amount of home currency

The cost will be the amount borrowed plus interest on that (home currency borrowing rate)

Illustration 1

Let's say we are a UK company and need to pay \$100 in 1 year. UK borrowing rate is 8% and US deposit rate is 10%. Exchange rate now \$2 - 2.2 :£

Step 1

Need to pay \$100 in 1 year so we borrow $100 \times 1/1.10 = 91$

Borrow just **\$91** as we then put it on deposit and it attracts 10% interest - to pay off the whole \$100 at the end

Step 2

Convert \$91 dollars now. We need dollars, so bank SELLS us them. They always SELL LOW. So $91 / 2 = £45.5$

Step 3

£45.5 is borrowed now. We will then have to pay interest on this in the UK for a year. So $£45.5 \times 1.08 = 49.14$

£49.14 is the total cost to us

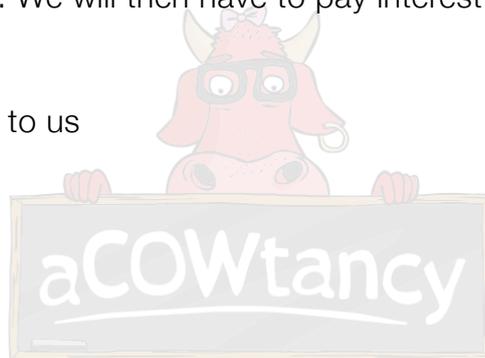


Illustration 2

Need to pay \$450,000 in 3 months

Exchange rate now: \$1.7 - 1.7040:£

Forward rates \$1.6902 - 1.6944:£

Deposit rates (3 months) UK 6% annual US 5% annual

Borrowing rates (3 months) UK 7.5% US 6.5% annual

Solution

1) Calculate how much foreign currency needed (discount @ foreign deposit rate)

(3 month interest on foreign deposit = $5\% \times 3/12 = 1.25\%$)

$$\$450,000 \times 1/1.0125 = \mathbf{444,444}$$

2) Convert that to home currency

The bank will sell the dollars. The bank will sell low.

$$444,444 \times 1.7 = \mathbf{£261,438}$$

3) Borrow that amount of home currency

Borrowed at 7.5% for 3/12 = 1.875% = $261,438 \times 1.875\% = £4,902$

Giving a total cost of $£4,902 + £261,438 = \mathbf{£266,340}$

Hedging a Receipt²⁷

The foreign receipt is in the future, we are going to get eliminate rate risk by getting that foreign currency NOW.

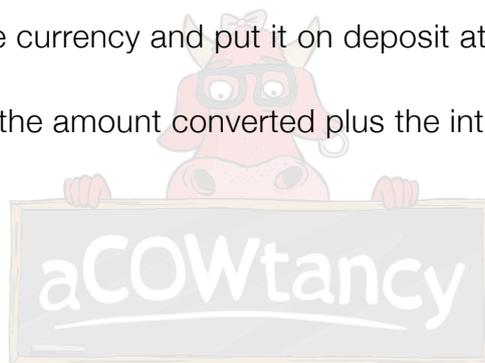
To do this we need to borrow it abroad. We do not borrow the full amount though, as the receipt will pay off this loan plus interest.

We, therefore, calculate how much is needed now by taking the full amount and discounting it down at the foreign borrowing rate

Now we know how much foreign currency we need NOW, we can convert that into home currency using the spot rate. Here the bank are buying foreign currency off us and so will BUY HIGH

We then take this home currency and put it on deposit at home

The eventual receipt is the amount converted plus the interest earned at home



²⁷ PP Q2d

Steps:

- 1) Calculate how much foreign currency needed (discount @ foreign borrowing rate)
- 2) Convert that to home currency
- 3) Deposit that amount of home currency

The receipt will be the amount converted plus interest on that (home currency deposit rate)

Illustration

Will receive \$400,000 in 3 months

Exchange rate now: \$1.8250 - 1.8361:£

Forward rates \$1.8338 - 1.8452:£

Deposit rates (3 months) UK 4.5% annual US 4.2% annual

Borrowing rates (3 months) UK 5.75% US 5.1% annual



Solution

1) Calculate how much foreign currency needed (discount @ foreign borrowing rate)

$$\text{Interest} = 5.1\% \times 3/12 = 1.275\%$$

$$\$400,000 \times 1/1.01275 = \mathbf{\$394,964}$$

2) Convert that to home currency

The UK company now needs to sell \$394,964 from the bank. The bank will BUY HIGH

$$394,964 / 1.8361 = \mathbf{\pounds 215,110}$$

3) Deposit that amount of home currency

This amount will be deposited at home at 4.5% for 3/12 = 1.125% = $215,110 \times 1.125\%$
= $\pounds 241,999$

Syllabus G3c: Identify the main types of foreign currency derivatives used to hedge foreign currency risk and explain how they are used in hedging (No numerical questions will be set on this topic)

Foreign Currency Derivatives

Currency Futures²⁸

These are **Standard** contract for set amount of currency at a set date - that means you can't get one for just the exact amount and date you need

It is a **market traded** forward rate basically - but standardised

Calculations of how these work are NOT required in the exam

So imagine a future as a forward rate - but the difference is often they are not completed. That means you never pay the rate - you close it out before

So lets say you get a future at an agreed rate and time. Immediately you must pay an initial margin. So now you have this fixed agreed rate

However the variable rate moves so that your fixed agreed rate isn't very good - now you have to pay more in

Eventually you will sell it and you'll make either a gain or loss - and this is taken out of the margins you've been putting in

Let's recap that again..

When a currency futures contract is bought or sold, the buyer or seller is required to deposit a sum of money with the exchange, called initial margin.

If losses are incurred as exchange rates and hence the prices of currency futures contracts change, the buyer or seller may be called on to deposit additional funds (variation margin) with the exchange

²⁸ PP Q2e

Equally, profits are credited to the margin account on a daily basis as the contract is 'marked to market'.

Most currency futures contracts are closed out before their settlement dates by undertaking the opposite transaction to the initial futures transaction, ie if buying currency futures was the initial transaction, it is closed out by selling currency futures. A gain made on the futures transactions will offset a loss made on the currency markets and vice versa.

Advantages

- 1) Lower transaction costs than money market
- 2) They are tradable and so do not need to always be closed out

Disadvantages

- 1) Cannot be tailored as they are standard contracts
- 2) Only available in a limited number of currencies
- 3) Still cannot take advantage of favourable movements in actual exchange rates (unlike in options...next!)



Currency Options²⁹

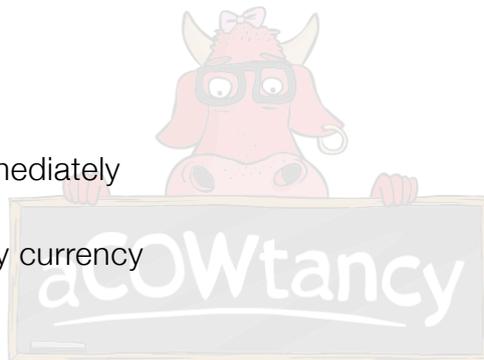
Allow the holder to buy (call) or sell (put) foreign currency at a specific exchange rate at a future date and are not standardised but tailored to client's needs

These protect against adverse movements in the actual exchange rate but allow favourable ones!

Clearly, because of this, the option involves buying at a premium.

Disadvantages

- 1) The premium
- 2) Must be paid up immediately
- 3) Not available in every currency



An advantage of currency options over currency futures is that currency options do not need to be exercised if it is disadvantageous for the holder to do so.

Holders of currency options can take advantage of favourable exchange rate movements in the cash market and allow their options to lapse. The initial fee paid for the options will still have been incurred, however.

²⁹ Dec 08 Q4d

Currency Swaps

The exchange of debt from one currency to another

2 companies agree to exchange payments on different terms (e.g. different currency)

Advantage

- 1) Easy
- 2) Low transaction costs
- 3) Spread debt across different currencies

Currency swaps are appropriate for hedging exchange rate risk over a longer period of time than currency futures or currency options.

A currency swap is an interest rate swap where the debt positions of the counter-parties and the associated interest payments are in different currencies.

A currency swap begins with an exchange of principal, although this may be a notional exchange rather than a physical exchange.

During the life of the swap agreement, the counter-parties undertake to service each others' foreign currency interest payments. At the end of the swap, the initial exchange of principal is reversed.

G4. Hedging techniques for interest rate risk

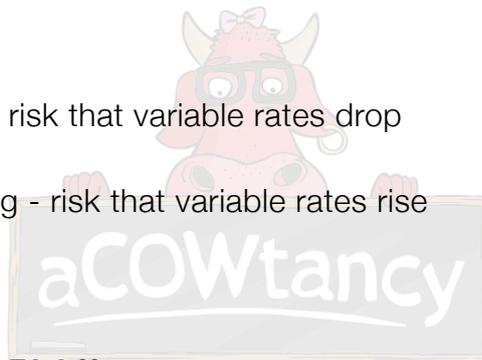
Syllabus G4a: Discuss and apply traditional and basic methods of interest rate risk management, including:

- i) matching and smoothing*
 - ii) asset and liability management*
 - iii) forward rate agreements*
-

Interest Rate Risk

Fixed rate borrowing - risk that variable rates drop

Variable rate borrowing - risk that variable rates rise



Hedging Interest Rate Risk³⁰

Forward rate

Locks the company into one rate (no adverse or favourable movement) for a future loan

If actual borrowing rate is higher than the forward rate then the bank pays the company the difference and vice versa

They are usually only available on loans of at least £500,000

³⁰ Dec 08 Q2a

Procedure

- 1) Get loan as normal
- 2) Get forward rate agreement
- 3) Difference between 2 rates is paid/received from the bank

Illustration

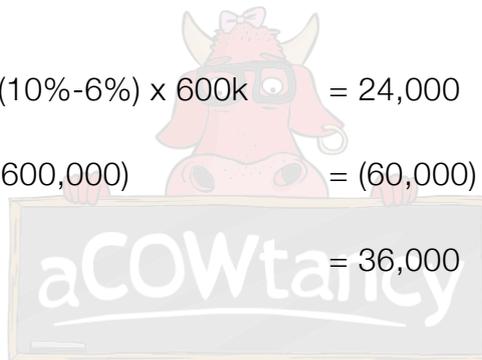
Company gets 6% 600,000 FRA

Actual rate was 10%

FRA receipt from bank $(10\% - 6\%) \times 600k = 24,000$

Payment made $(10\% \times 600,000) = (60,000)$

Net payment = 36,000



Syllabus G4b: Identify the main types of interest rate derivatives used to hedge interest rate risk and explain how they are used in hedging.

(No numerical questions will be set on this topic)

Interest rate Derivatives

Interest Futures

Standard contract for set interest rate at a set date

It is a **market traded** forward rate basically

Calculations of how these work are NOT required in the exam

As interest rates rise - futures prices fall

Let's say you are expecting interest rates to rise.

You would sell a futures contract (at the price now), and when the interest rate rises, the value of the futures contract will fall.

You would then buy the contract at the new reduced price, making a profit.

As interest rates fall - futures prices increase

Let's say you are expecting interest rates to decline in the near future. You would buy a futures contract

When interest rates fall, the price of futures increase. You then sell the bond futures contract at a higher price.

Borrowers sell futures to hedge against rises

Lenders buy futures to hedge against falls

Interest Rate Options

Grants the buyer the right (no obligation) to deal at a specific interest rate at a future date. At that date the buyer decides whether to go ahead or not

These protect against adverse movements in the actual interest rate but allow favourable ones!

Clearly, because of this, the option involves buying at a premium.

Interest Rate Swaps

2 companies agree to exchange interest rate payments on different terms (eg fixed and variable)

Advantage

- 1) Easy
- 2) Low transaction costs (compared to getting a different loan)

