Needs of Investors

Investors may have asset types they cannot invest in due to

- Insufficient assets for direct investment
- Lack of information or experience
- Legislation
- Choice (companies stated aims)

They will also have different objectives in investment

- Paying liabilities as they become due
- Proving they are solvent on a prescribed basis
- Feelgood factors (owning own house)
- Maximising profit for a given risk

If there are just enough assets to cover the liabilities, it is prudent to convert them into a form similar to liabilities, to ensure continued cover. More assets gives more scope to deal with problems, so non matching forms with higher returns can be chosen.

When finding assets to meet the objectives we need to consider

Security	(of capital, income, etc; fluctuations in value)
Yield	(income / capital, fixed / indexed)
Spread	(diversification)
Term	(individuals may have short term horizons)
Exchange rate	
Marketability	(if future liabilities uncertain, divisability)
Tax	(and expenses)

There are also practical considerations such as the existing portfolio and what competitors are doing.

Taxation

This can have a dramatic effect on the returns investors recieve. We should consi

The total tax rate, and how it is split between components of return
The timing of tax payments
To what extent taxes can be reclaimed or aggregated between different investments
Any amounts which may be taken tax free.

Corporate tax comes into this, because sometimes tax is paid at source by the companies. If there are different taxes for dividends and capital growth, then the investor will also prefer to invest in companies that pay in the more efficient form.

Equities

Equity shareholders own the company and are entitled to all its net profits, in the form of a cash dividend, after interest on stocks and loans has been paid. These are uncertain, and initial running yield is low, but increases are relatively high and the market value tends to increase correspondingly.

Preference share dividends are limited to an amount which must be paid before ordinary dividends. They may be cumulative, redeemable, participating or stepped.

Convertables are unsecured loan stocks or preference shares that may convert into a specified number of ordinary shares of the issuing company at certain dates.

Warrants are options issued by the company and give the holder the right to purchase shares at a specified price at specified times in the future.

Most equity investment is in shares listed on a stock exchange. Listed companies must comply with stock exchange regulations, giving investors some protection, and meaningful market values are easier to find out. The cost of dealing in quoted shares is closely linked to the marketability

There are two main dealing systems in stock exchanges

In quote driven systems, market makers quote buying and selling prices at which they are prepared to deal. Investors can find prices for all stocks in their portfolio

In an order driven system buyers and sellers are matched. Stockbrokers observe the prices at which deals are made and make bids and offers themselves. When making bids and offers, they are effectively acting as market maker.

To ensure orderly markets, stock markets have price limits. When these are hit, the market closes to give participants time to reassess their position.

It is sensible to group equities into sectors for analysis because

Factors (resources, markets, structures) changing in one company are likely to affect oth
Information will come from common sources in similar formats.
It assists portfolio classification and management.

The FTSE Actuaries industry classification system is one such grouping

Resources — These extract and supply primary products. They tend to be large global companies. They are commodity price dependant and can be risky.

Basic Industries — These produce intermediate goods such as chemicals and steel.

General Industries — These tend to produce capital goods. Both "Industry" groups are cyclic, moving ahead of the trade cycle. As such, they are dependant on investment spending (including by the government) and have volatile profits.

Consumer Goods — This is split into cyclical (durable) and non cyclical (non-durable) sectors
It is increasingly capital intensive and has low profit margins.

Services — These are also split into cyclic and non cyclic. They are labour intensive and the domestic market is the most important.

Utilities — The need for extensive physical infrastructure makes these natural monopolies.
This leads to government having a high interest in them.

Financials — These are capital intensive. However, labour costs are often important.
Banks have high gearing and volatile profits
General insurers have volatile profits and virtually no borrowings
Life insurers have stable profits and low gearing.

Information Technology. These have low dividends and largely intangible assets.

Bonds

Government bonds give a fixed income stream and a fixed final cash sum.
If issued by a reputable government, there is virtually no risk of default.
However there is risk of inflation eroding its real value and a risk that the market value will fall for those wishing to sell early. In some markets, the individual coupon and interest payments can be traded separately - these are strips.

Corporate bonds are similar to government bonds, but less secure and marketable. To improve security, there are several types

Morgage debenture	Long term debt secured by a fixed charge on specified propert
Debenture	Secured by a floating charge over all company assets
Unsecured loan stock	Long term debt not secured on assets
Subordinated debt	Debt that ranks behind another class for repayment.

When assessing the security of debt, investors will look at

Income cover (usually ×4)	The number of times the operating profit covers the interest o the loan and all equal or prior ranking loans
Capital cover (usually ×2.5)	The number of times the assets of the company cover the amount of the loan and all equal or prior ranking loans.
Credit ratings	These are given by a credit rating company as an indication the likelyhood of default. They are generally highly reliable.

Junk bonds do not meet the usual requirements of income and capital cover

Euroboards are issued internationally by a group of banks who underwrite the issue and distribute it to their clients, including large companies and national borrowers.

Foreign bonds are issued by non-domestic investors in the domestic currency.
They include Bulldogs issued in London, Samuri issued in Tokyo and Yankee issued in New

Money Markets

Money markets cover short term investments offering returns at the prevailing short term interest rate. Security and marketability are generally good. However, they are only available to larger institutions - rather than a stock exchange, they are traded through an interbank money market. They include

Treasury bills	
Local authority bills	
Bills of exchange	Invoice endorsed by merchant bank sold to raise finance
Certificates of deposit	Certificate showing fixed term bank deposit. Can be sold
Commercial paper	Bearer documents issued at discount and redeemed at par.
Term deposits	Bank deposit for a fixed term
Call deposits	Deposit with immediate access to the money
Floating rate notes	Eurobonds with variable interest rate

There are a number of reasons why holding money can be useful.

Known short term commitments
Uncertain liabilities
Maintaining liquidity so they can take advantage of opportunities
Recent cash flow which has not yet been reinvested
Preservation of value of capital (if highly risk adverse)
Economic circumstances where cash may outperform other asset types

There are several economic scenarios where cash may be more useful

The investor predicting a higher interest rate rise than the market does
The start of an economic recession - equities and bonds fall
Depreciation of domestic currency - short term interest rates raised by the government
Any time that there is economic uncertainty and stability is desired.

Derivatives

Futures are standardised contracts in which the holder must buy (call) or sell (put) a set amount of a specified asset at a fixed price at a future date

A european option allows the holder to decide whether or not to trade.

An american option allows the holder to decide whether or not to trade, and they may trade at any point before the final date

On the dealing floor, traders meet in pits and trade by open outcry. When two traders agree to deal, the contract is created. The clearing house then acts as a party to every trade, removing the credit risk of individual participants.

The clearing house protects itself by demanding that margin is deposited with them, which acts as a cushion against potential losses. This is changed on a daily basis (marking to market) as the price of the underlying assets changes. There are limits on price movements so that margin does not lag too far behind reality. Option holders do not need to pay margin.

Most positions are closed before delivery by taking an opposite position. On delivery a cash settlement is usually made.

A forward contract is similar to a future, except is is non-standardised and arranged outside the stock market, usually with a bank as counterparty. Credit risk is a bigger factor and they usually result in delivery.

A swap is a contract where two parties agree to exchange a series of payments according to a prearranged formula. Typically, the parties swap assets, make interest payments on the assets and swap assets back at the end.
Banks may act as middlemen and take a proportion of interest payments.
This protects both sides from credit risk, although market risk remains.
This is the risk that market conditions change so that the value of the swap no longer matches.

Property

Property investment involves the purchase and management of buildings and land. The two main characteristics are indivisability and uniqueness.

A unit of property is indivisable, so unit size is large. One must use significant assets to invest and the cost of holding a diverse property portfolio is even higher.

Each property is unique, so its value is hard to assess. One must use skilled consultants for valuation, which costs time and money. Even then the value is subjective, especially with few comparable properties, or when sales prices are kept secr The 'true' value will only be found on sale of the property.

Uniqueness also means each property must be customised for its new tennants. This adds to the dealership costs imposed by the valuation cost and tax on sales.

These high frictional costs mean tennants do not wish to move often. Thus leases are at fixed levels with infrequent rent reviews (often 'upwards only'). When setting rents, provision must be made for relatively high management costs, voids (no tennants) and recovering unpaid rent.

Infrequent sales due to unmarketability and constant rent payments means property is stable in the short term. In the long term, it is volatile, moving in cycles lagging behind the market. It has some protection by being inflation proof, and through land being indestructable and thus always retaining some val

In the long term, investors can change the investment characteristics of a building. One vital example is modernisation when the building becomes obsolete. Others include redevelopment or renegotiating the lease. A final way is taking advantage of marriage value - the value added by combining several different interests in a property. A key example is freeholding compared to lease holding.

Property Purchase

A freeholder owns the building in perpetuity. They have the right to do what they want with the building, subject to covenants, easements such as rights of way, planning and building regulations and statutory requirements not to cause a nuisance.

The freeholder may grant leases. These give exclusive possession to the lessee for a fixed period. The terms of a lease are often referred to as covenants. They can restrict subletting, hours and type of use, etc. They typically restrict the flexability of the leaseholder and thus reduce the value of the lease.

For a very long lease with fixed rent payable which is low in relation to the rack real, the investment is very similar in nature to a freehold. For a short term leasehold to be viable as an investment, the rent must be greater than the rent payable by the buyer.

The usual method of property investment is outright purchase. Examples of other methods of finance include

Morgages — Long term fixed rate morgages with interest rate equal to long dated high coupon government bonds, plus a margin.

Sale and leaseback — Here, property owners sell their property to an institutional investor who leases it back to them. Both sale and lease price are typically below market value

Development finance — Institutions sometimes take an equity interest in property development, typically in conjunction with a property developer with whom profits are split.

Types of Property

A prime property scores highly on the following factors

- Location
- Age and condition
- Size
- Tennant quality
- Comparable properties
- Lease structure

We will use this to look at different property types

Offices

Location	Prime locations are easily accessible. There are two submarkets - major financial centres and the provinces. Rents can vary widely between the two.
Age	Offices are low maintainance, but become obsolete as requirements change.
Size	Offices have a large unit size
Tennants	Rental income is secure as it is a small portion of tennants outgoings. There is a wide range of tennants across different industry sectors Multitletting spreads the risk of tennant default. When let to a single tennant on a full repairing, insuring lease, management costs are low.
Comparables	There are lots of comparable properties
Lease	The typical 25 year lease has five 'upword only' rent reviews.

Offices are popular with major institutional investors

Shops

Location	The exact position has a major impact on tennants takings. This is vulnerable to changes in the pedestrian flow, due to shopping centre opening, etc. The amount of frontage is also very important.
Age	There is low depreciation as most value is due to the site. In addition, most shops are supplied to retailers as empty shells.
Size	Size varies considerably, but tends to be smaller than offices.
Tennants	Rent is a high proportion of tennants outgoings, so income is not secure. Tenants are all in the retail sector, so rent depends crucially on that sector.
Comparables	There are lots of comparable properties
Lease	Leases are for much shorter periods

Shops rank just behind offices in terms of institutional investor importance

Industrial Property

Location	Location is not critical, provided there is access to transport, markets and labo
Age	This deteriorates quickly and tends to become obsolete quickly.
Size	Big physically, but economically small as site value is worth little.
Tennants	Factories are special purpose and typically unsuitable for other industries. They are vulnerable to economic recession in that sector.
Comparables	Few, because of the special purpose element.
Lease	This is high yield because of the above factors and because industrial property is quick and cheap to build, so oversupply can be corrected.

This forms a lower proportion than either offices or shops.

Warehouses

These are similar to an industrial property, except labour is less crucial and good access to motorways / ports is more crucial.

Residential

This is relatively unpopular because of political interference in the form of rent controls and tax disadvantages, poor quality tenants and the poor image of the residential landlord, high administration costs due to low unit size and irrational markets caused by homeowners forcing prices above a level that can be justified from the economic perspective.

The luxury end of the market is less subject to these problems, and is likely to be preferred.

Shopping Centres

This is a large, unmarketable, highly risky development, often financed by only one or two institutions. Investors would want to be sure retailers support the concept before starting.

Retail Warehouses

Single storey out-of-town shops for non-food retail sales of large items. Typically with prominent frontage and adequate parking.

Agricultural land and Forestry

The value of farmland depends on government agricultural policies and its attractiveness can vary considerably.

Overseas Investment

There are three main reasons for investing overseas

Diversification Overseas investment is in a different economy, currency and stock market. There is a larger range of companies and some investment opportunities not available locally.

Meeting Liabilities Foreign currency liabilities may be best matched by foreign curr investments. In the long term, real liabilities can be well matched by real investments in a foreign currency.

Better returns There may be better returns as fair compensation for higher risk [This is market risk, not currency risk which others don't face] Market inefficiencies may lead to a country being undervalued. Emerging markets in particular give the possibility of price anomalie and may be cheaper because of perceived risk.

There are also a number of risks

Adverse currency moves Investors with domestic liabilities are mismatched, although this can be overcome by hedging with derivatives.

Informational Problems Increased expertise is required due to different accounting practices, less information available, language problems and time delay

Taxation Additional tax will be liable where no double taxation agreement hol

Poor markets Less regulation and less liquidity.

Political Problems Risk of adverse political developments such as restrictions o shares held, assets confiscated, money not allowed to leave the country, etc.

Collective Investment Vehicles

Regulations covering these vary, typically covering aspects such as categories of assets held, tax relief and gearing levels. In the UK there are three types

Investment trusts (closed end funds - closed to new money after launch)

These are public companies whose job is to manage shares and investments. Their shares are quoted on the stock exchange and are bought and sold normally. They may take out loans, raising the prospect of gearing. Their most important ratio is net asset value per share. The amount by which the share price varies is

$$\text{discount to NAV} = \frac{\text{net asset value} - \text{market price}}{\text{net asset value}}$$

They usually trade at a discount due to the management charge, usually based on market value of funds under management, and lower marketability.

Unit trusts (open end funds - open to new money after launch)

These are trusts which can create units for investors to buy. The underlying unit price is determined by Market price of assets / number of units. There is a slightly higher price for buying and lower price for selling - the bid-offer spread. Slightly different definitions for market value are used when the trust is expanding and contracting, leading to a higher spread still. There is also a management charge. Unit trusts may not gear their returns. Marketability is high because it is always possible to sell units back to the trust.

Open ended investment companies (open end funds)

These are half way between investment trusts and unit trusts. They are open ended and units are priced at NAV, however they are governed by company law, there is no bid-offer spread and entry and exit charges are explicit.

Collective vs Direct Investment

There are a number of advantages to collective investment

- Diversification even with small investments
- Expertise in specialist areas
- Divisible holdings
- Dealing expenses are lower
- Easily known prices
- Can invest in areas the investor may not be able to invest in

These must be weighed against the disadvantages

- Expenses and management charges
- Loss of control
- Not diversified from domestic stock market
- Variations in stock market may increase volatility. (discounts to NAV may vary)

The following should also be considered

- Marketability
- Taxation
- Gearing

Non collective indirect investment

Collective investments are useful when investing in areas which need considerable resource These include overseas and property. There are other ways to gain indirect exposure to them

Investing in multinational companies based in the home market allows you to deal in the familiar market, and the companies will have expertise and conduct their business in the most profitable areas. However the earnings will be diluted by domestic earnings and shares will move with the domestic market. There may be substantial unknown currency exposure. There is little control, and there may be tax disadvantages.

Investing in companies with substantial export trade has similar advantages and disadvantages.

Shares in property companies are the most important indirect property investment. There are two types.

Development / investor	Tends to invest for the long term. Valued on NAV
Development / trader	Tends to buy, renovate and sell properties. Valued on anticipated profit

They are similar to collective investment vehicles. Unit trusts have slightly more stable prices due to negative gearing (holding cash in case of heavy withdrawal)

Influences on Investment

The price of everything is determined by supply and demand. In the short term, supply is fixed, so demand has the primary influence on price, and hence return. An investors required return can be split into three parts

Required return = risk free rate of return + expected inflation premium + risk premium

The magnitude of these components varies as

- The economy changes
- Investors preferring certain income types gain or loose investment money
- Investors preferences change due to tax, political uncertainty, etc.
- Investors perceptions of risk and return change.

The economy changing is the only one that can be sensibly modelled. The key factors are short and long term interest rates, inflation, growth and exchange rates.

Short term interest rates are largely controlled by the government to meet policy objectives. Low interest rates encourage growth, inflation and a weak domestic currency.

Individual Investments

Valuation methods for individual investments include

Historic book value	Price originally paid allowing for depreciation
Written up/down book value	Price originally paid adjusted for changes
Market value	Often only known on sale. Can be volatile.
Smoothed market value	Average over (say) three months.
Discounted cashflow	Consistent with basis liabilities are valued. Need discount rate
Stochastic model	Discounted cashflow with random variables.
Arbitrage value	Cost of derivatives forming equivalent investment.
Economic value added	Difference between annual return on capital and WACC.
Expected utility	Calculate utility instead of cash flows. Best for comparison

The most important are market value and discounted cashflow.

Valuing Equities

Investors expected returns consist of the income stream of dividends and the expected capital gain. The latter is equivalent to the expected annual growth of dividends, so for valuation purposes, assume the share is held in perpetuity.

A simple valuation method is then the discounted dividend model $V = \sum D_t v(t)$
It can be simplified farther to $V = \frac{D_0(1+g)}{i-g}$ by assuming constant growth g and constant interest i. This is usually estimated as long term government bonds plus a risk premiu

It is clear that the main factors are interest rates, growth and the risk premium. Interest rates are particularly important because low interest rates also stimulate growth and make equities relatively attractive in comparison to cash or bonds.

The risk premium and expectations of growth are both very subjective. They will vary depending on politics, overseas markets, and the general feeling in the market.

Investors are generally indifferent to inflation, but there are second order effects, such as high inflation giving poorer economic growth and the prospect of high interest rates to combat it.

Finally, supply and demand play obvious roles, so changes in currency situations, tax situations, institutional cashflow, alternative investments and simple equity supply (for example when lots of firms are denationalised) will have the obvious effects.

Equity Ratios

There are several ratios useful to equity investors. The most important are

$$\text{Price earnings ratio} = \frac{\text{ordinary share price}}{\text{earnings per share}}$$

$$\text{Dividend yield} = \frac{\text{dividends per share}}{\text{share price}}$$

$$\text{Payout ratio} = \frac{\text{Price earnings ratio}}{\text{net dividend yield}} = \frac{1}{\text{dividend cover}}$$

$$\text{Net Asset value per share} = \frac{\text{Net Asset Value}}{\text{number of shares}} = \frac{\text{share capital + reserves - intangibles}}{\text{number of shares.}}$$

$$\text{Economic value added} = \text{Net operating profit after tax} - \text{WACC} \times \text{Net assets}$$

$$\text{Market value added} = \text{Market capitalisation} - \text{Balance sheet value}$$
$$\equiv \text{Market price of EVA.}$$

Fundamental Share Analysis

There are two stages in fundamental share analysis. Firstly, you constrad a detailed model of the company which tells you what all the future dividends are likely to be. Secondly, you use this model to find the value of the companies shares. If they are worth more than the market value, buy them. If they are worth less, sell them.

This model can be as simple or complicated as desired. Factors to consider inclu management, product quality, growth prospects, competition, input costs, retained prof post history, etc.

When deciding on factors, one should investigate financial accounts and ratios, dividend and earnings cover, profit variability and growth, level of borowing, liquidity levels, asset value growth and compare these with competing companies.

Sources of information include the financial press, the trade press, public statements, stock exchange information, government sources, company visits, discussions with management, discussions with competitors and stockbroker publications.

Notional Portfolios

When valuing a portfolio of equities using market value, we can have problems with volatility and with discounted values, large changes due to changes in the investment portfolio.

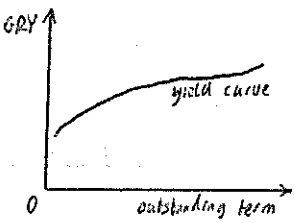
One way to overcome these is using a notional portfolio. Use the portfolio market price to buy a predetermined set of shares, and use discounted value to value these. This notional portfolio may reflect the strategic asset allocation or the liability profile

This also has the useful result that the bases can be consistent between the assets and the liabilities.

The Yield Curve

The future cashflow from bonds is known exactly. Therefore their value depends only on how much investors believe these cashflows to be worth. This depends on future interest rates, inflation and investor opinion of these. These vary crucially by term

A useful way of looking at effects is the yield curve. This is usually plotted for the gross redemption yield on maturity, but may also be plotted for the zero coupon yield or the par yield. There are several theorems about it which account for its shape.



Expectations Theory Sequentially buying short term bonds, we would expect the overall yield to be similar to that of a single long term bond. Otherwise there are arbitrage opportunities. Taken to its logical conclusion, we would expect each yield to be the product of all expected spot yields up to that date.

Expectation of Inflation This is one of the biggest influences on expected interest rates. - they usually match it closely. Moreover, high inflation could result in the value of investments being eroded, so long term bonds have an additional inflation risk premium.

Liquidity preference Investors prefer to be able to access their money and so require greater return to invest for long periods of time.

Market Segmentation Banks like short term bonds and pension funds like long term ones. Thus medium term ones have a slightly higher yield due to lack of demand.

Index linked bonds have a similar curve but with expected inflation, and the inflation risk premium stripped out.

Bonds and other Investments

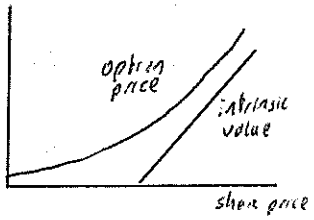
The bond market is dominated by the government and their attempts to control economic objectives and the fiscal deficit. Corporate bonds can frequently be valued by taking a government bond and adding a risk factor depending on expectations about the possibility of default.

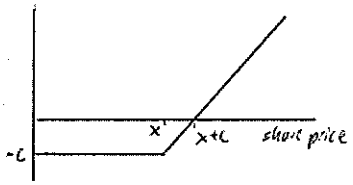
The exchange rate can have an effect on bond pricing as numerous investors are from overseas, and supply and demand takes a role. Similarly changes in institutional cash flow can have an effect.

Finally, some bonds have derivative features and should be valued as such, and cash should be looked at as very short term bonds (which bills, etc. are)

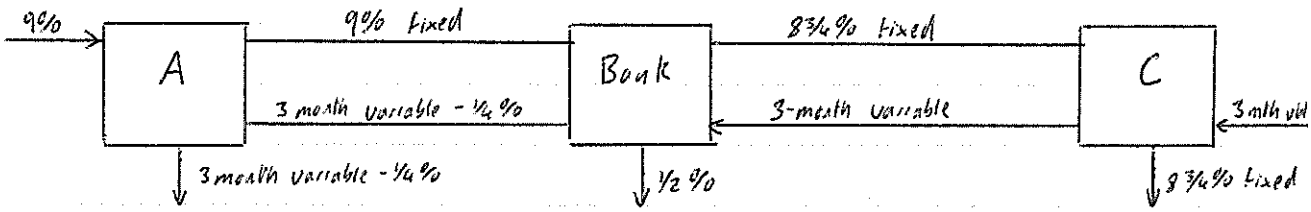
Derivative Valuation

The intrinsic value of a call option is the profit it would make if exercised immediately. If this is nonzero, the option is in-the-money, if zero if is out-of-the-money. The excess above the intrinsic value is known as the 'time' or 'option' value. It is often useful to plot profit on a position diagram. The one on the right has X as exercise price, and C as the call option premium





Swap valuation will not be discussed in great detail. I will merely draw a picture and point out that arrows represent interest payments



Convertables are valued by discounting the future income stream. We consider a fixed income stream to date of conversion and a stream of dividends thereafter. Care must be taken in checking the investor would actually want to convert, and their required rate of return and the underlying share dividend growth.

Another method is to use the underlying share price to value the dividend streams. This gives bad answers when the shareholders expectation of growth and the markets don't match up.

Property Valuation

The economy affects the property in three ways.

Occupational Demand — Anything that effects economic activity will effect the business occupying property and hence the demand for property itself. Thus interest rates and economic growth have a big link. New patterns of economic activity will likewise affect property usage

Investment demand — This relates significantly to the occupational demand. However, changes in economic expectations, particularly inflation can have significant effects.

Supply of Property. — Property is fixed in location and takes time to develop. This means there are supply side lags. In addition planning permission can restrict supplies. Unmarketability due to transaction costs and segmented markets also plays a role.

The traditional way of valuing property was to look at the rack rent of similar properties, estimate the yield, and that gave the value. This has problems because yield estimation takes a lot of expertise.

Therefore discounted cash flows have been coming into favour.
We will need to know such things as running costs, voids, growth in rack rents, tax, valuation rate of interest (take bond yield, then add margins for risk and marketability), lease expiry, depreciation, and so on.

Investment Indices

The most popular construction method is the weighted arithmetic mean, with weight derived from market capitalisation adjusted for strategic holdings ('free float')

$$I(t) = K \sum (w_i \, P_{i,t} / P_{i,0}) / \sum w_i$$

When a company has a rights issue, we use chain linking to ensure the index remains consistent. Essentially, we adjust K to ensure that $I(t) = I(t+\delta)$. The formula is now equivalent to the following, where $B(t)$ is calculated by chain linking.

$$I(t) = \sum N_{i,t} P_{i,t} / B(t)$$

We measure dividends separately, each dividend being $xd_{i,t} = N_{i,t} D_{i,t} / B(t-1)$. Summing gives the total $XD_t = \sum_i XD_{i,t} = \sum_i \sum_\tau xd_{i,t}$. Alternatively, we can estimate it using the net dividend yield. Either way, we can calculate the total return index

$$TRI(t) = TRI(t-1) \; I(t) / (I(t-1) + XD(t-1) - XD(t))$$

Other methods include unweighted means and geometric means.

Investment Indices

These are useful for the following.

Analysing movements	Measuring short term movements
	Providing a history of movements
	Predicting future movements
Valuing assets	Valuing notional portfolios
	Analysing market subsections
	Benchmarking investment returns
Creating products	Basis for index trackers
	Basis for derivative products
Comparisons	Comparing bond yields with those of different terms and equities.

There are several well known indices

England	FTSE 100	} FTSE 350	} FTSE All share
	FTSE 250		
	FTSE Small Cap	(350)	
	FTSE Fledgling	(700)	
	FTSE AIM	(300)	
America	Dow Jones	(30)	
	Standard & Poors	(500)	
Japan	Nikkei	(225, 300)	
	Topix	(1100)	
Germany	DAX	(30)	
France	CAC	(230)	
World	Morgan Standley CII		
	FTSE World indices		

Performance Measurement

This can be used for

- Improving future performance — Planning future strategy; Identifying weak areas; Giving managers incentives
- Comparing against target rates
- Comparing with other portfolios — Investing in other portfolios; Hiring a new investment manager

It is limited by

- Past performance being a poor guide to future performance
- Different levels of risk offering different returns
- Different funds having different objectives
- Short termism, as fund managers optimise their fund for the measurement.
- Cost of performance measurement may exceed its value
- The frequency where performance measurement gives sufficiently up to date results without being swamped by spurious short term changes is hard to find

There are three simple methods of performance measurement. Money weighted rate of return simply calculates the overall rate of return during the relevant period. It is not very suitable because cashflows into or out of the fund can have a large effect. Time weighted rate of return calculates the rate of return between major cashflows, and takes the product. It is impractical, as we may not have the appropriate fund values at these cashflow dates. Linked internal rate of return splits the period into lots of small chunks, finds the MWRR for each part, and takes the product.

Holding period return is $P_1 + d / P_0 - 1$. It does not allow for dividend reinvestment, and is thus inaccurate.

Comparison with other Portfolios

There are two ways to compare the portfolio with an index.

- Seeing what the situation would be, had the fund invested in the index instead
- Comparing the time-weighted return from each.

There may not be an appropriate index to compare against. In this case we can compare against a predetermined benchmark fund - a notional portfolio. This may include indexes as well as shares, etc. Typically, there will be elements from different sec When specifying the benchmark portfolio, it is important to set out how new money and investment income is to be split between these sectors, and how often the benchmark is rebalanced into proportions from the different sectors.

We can also separate the fund performance into parts - sector and stock selection. We examine this by looking at how the fund would have done using sector splits the fund used and the stock selection the benchmark used.

We also need to take account of risk - did the portfolio do well simply because it was invested in risky assets. The best way of finding this is finding the beta of the portfolio and using it to calculate the expected return using CAPM or APT. and comparing this to the performance.

Finally, the benchmark portfolio could be how well competitors did during the same period.

Portfolio Management

The key distinguishing feature in portfolio management style is how active or passive it is. Active investment involves seeking out overpriced or underpriced assets or sectors usi various techniques, to try and outperform the market. Passive investment simply hol appropriate assets and hopes to move with the market. There can also be a mix in strategies.

One way a mixture can occur is with top-down portfolio management. First assets are allocated between classes, then sub allocated within the classes. Some asset classes may be managed actively, and some passively. For example blue chip shares may be too settled to make an active strategy worthwhile, and conversely developing markets may have too little information, so an index tracker may be an easy way to get sufficient diversification. Bottom-up 'stock picking' on the other hand is very active.

Active investment techniques include fundamental analysis, quantitative analysis (usin multifactor models), and technical analysis (including chartism, mechanical trading rule and relative strength analysis). In the bond markets, where predicting future values are easier, we can add anomoly switching (buying cheap stocks and selling them when they have returned to normal price levels) and policy switching (when you have different expectations to the market, buy so that, should your expectations hold, you will make a profit). We must ensure that profits cover the expenses/dealing costs.

Passive investment's prime technique is index tracking. The simplest method is full replication - hold exactly what the index does. This has troubles in terms of dealing costs when index constituents change, and requires a lot of resources. Other possibilities include partial replication, or holding an appropriate combinati of shares, cash, derivatives to replicate the index performance - a synthetic tra

Portfolios and Liabilities

So far, we have not taken liabilities into consideration when investigating strategies. In real life we will be attempting to meet them.

The simplest approach, if we know all future liabilities, is complete matching. Buy a set of securities whos income exactly match the outgoings. In reality, very few liability profiles are so easy to match, due to uncertainties about the risks, inflation,

Immunisation is investment in assets so the value of assets is greater than that of the liabilities, whatever change in interest rates is. Redington's conditions are conditions for such a state to occur. They are 'present values are equal', 'expected future values are equal' and 'the spread of assets is greater than the spread of liabili
It has problems as small interest changes are required, constant rebalancing is needed, all cashflows must be known, and the assets may not exist.

As always, we can get around such problems by making a more complicated model. Create a stochastic model of the portfolio and liabilities, and run it several times to optimise the asset allocation.

Derivatives in Portfolios

These have four functions in an investment portfolio

Hedging This is arguably the most important use, allowing considerable risk to be removed, although there is still the risk of cross hedging.

Speculation This is pretty much the opposite of hedging. It includes straddles

Arbitrage When the price of the future and the price of the underlying asset don't quite line up with each other.

Changing Portfolio Characteristics If we wished to increase exposure to bonds at the expense of equities, instead of selling equities and buying bonds, we could sell equity futures and buy bond futures.

One problem is that they are sometimes not long term enough. In this case swaps could be used. Another is that they are less useful if returns are uncertain. Another is that dealing costs may accumulate if attempting to hedge many small amounts.

Apart from risks of markets moving adversely, we need to consider credit risk, operational risk and relative performance risk.

Regulation of Financial Services

It is important to have financial services regulated in order to

Maintain confidence
Protect consumers
Correct market inefficiencies

The main functions of a regulator are

Setting and reviewing policy
Supervising the management of organisations
Enforcing regulations
Providing information
Registering firms to do classes of business

Specific tasks include

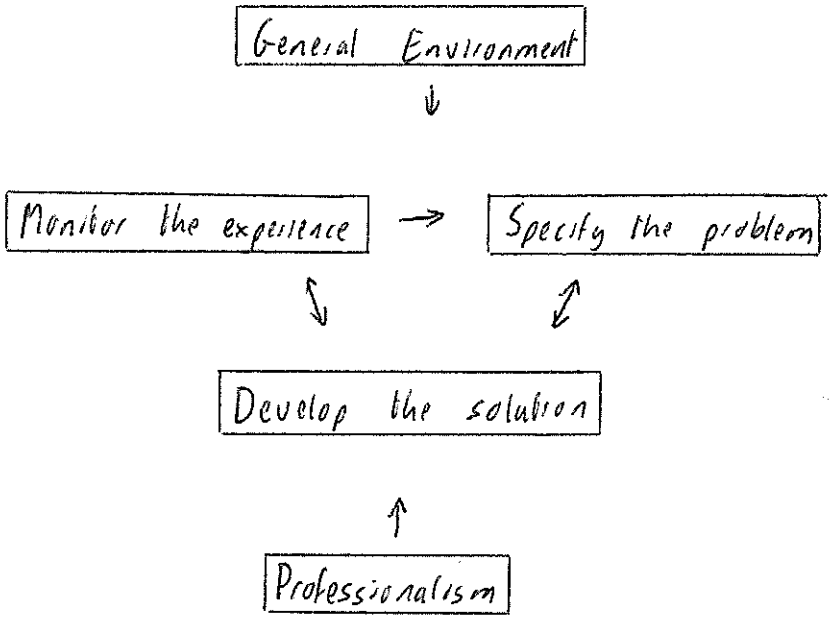
Forcing information disclosure
Ensuring capital adequacy
Chinese walls to stop conflicts of interest
Setting negotiation rules to protect individuals
Compensation schemes
Ensuring the market is transparent, orderly and gives protection

There can be different levels of regulation

Unregulated markets - useful where only professionals operate
Voluntary code of conduct - vulnerable to a few rogue operators
Self regulation - Implemented by people close to the market, so efficient and can respond rapidly to change. However closeness can lead to ignoring third party interests and blocking new entrants
Statutory - Implemented by the government. Disinterested and bureaucratic.
Mixed regimes - What occurs in real life.

Actuarial Control Cycle

This can be summarised as follows



Capital Project Appraisal

We should go through the following stages when appraising a capital project.

Initial Appraisal — Briefly check if the project is likely to be accepted

- Compatibility with other projects undertaken
- Satisfying political constraints
- Sufficient upside potential
- Uses scarce resources most effectively.

Detailed Appraisal — Firstly, carefully define the project and its scope, including success criteria, time limits and the exact responsibility of members.

Evaluate the most likely future cashflows and find the projects NPV.
For projects with standard systematic risk, use the company WACC.
For those with high systematic risk use a WACC with an appropriately higher beta (see similar companies or use CAPM). Overly high discount rates are to be discouraged.

Identify Risks. Make a high level preliminary risk analysis. Then brainstorm with appropriate experts. A useful tool is the risk matrix. This has stages of the project on the left

Investment planning	Promotion of concept
	Design
	Contract negotiations
	Project approval
Asset Creation	Raising capital
	Construction
Operation	Operation and Maintainance
	Receiving revenues
Close down	Decommisioning

and has types of risk on the top

Political - External non competitors - government, environmentalists
Business - Market / competition - competitors releasing own project
Economic - Macroeconomic changes - inflation increasing
Project - Non money within own project - faulty design failing
Financial - Money within own project - more expensive to produce than expected
Nature - Natural events - earthquakes, bad ground conditions
Crime - Any crime - fraud, vandalism

Analyse Risks For each risk, identify with expert assistance

Frequency of occurance - half the time or practically never.
Degree of interdependance - all risks occur together, or uncorrelated
Controllability - completely mitigatable or uncontrolable
Impact - slight delay or complete disaster

and use this to estimate the NPV of the risk. Using scenario analysis or stochastic modelling, find the variability of the resulting project NPV.

Mitigate Risks For each case look for ways of mitigating the risk, including

Redesign the project so it no longer has the risk, or it is reduced
Reduce uncertainty about the risk by further research
Transfer the risk to subcontractors
Insure the risk
Share the risk with another party

See how each affects the NPV and its volatility, and choose appropriate options for each

Investment Submission Finally, a decision must be taken, based on the financia
gains, risks, and the factors identified in the initial appraisal. Additional considerati
may be given to

Allowance for bias in the estimates
Knowledge not in the possession of those preparing the submission
last minute developments
doubts over feasability or quality of implementation, overall project credibility.

The project may now be accepted, rejected, or deferred until the time is right