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Certificate in Investment Management

Investment Management

Edition 4, June 2025

CISI CHARTERED INSTITUTE FOR SECURITIES & INVESTMENT APPROVED WORKBOOK

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20089900696
Printed on Carbon Captured paper

This workbook relates to syllabus version 4.0 and will cover exams from 20 September 2025 to 19 September 2027

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This workbook has been written to prepare you for the Chartered Institute for Securities & Investment's Investment Management exam.

Published by:
Chartered Institute for Securities & Investment
© Chartered Institute for Securities & Investment 2025
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Chapter One

The Investment Management Industry

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1. Introduction

Investment management is the professional management of financial assets (which can include equities, bonds, property and alternative investments) to enable clients to meet specific investment goals. It involves constructing and overseeing a portfolio of assets, with the aim of achieving a targeted return while managing risk. A typical element of investment management is holding assets as tax-efficiently as possible – in other words, minimising a client's tax burden, while maximising after-tax (ie, net) returns.

The approach taken in investment management will depend heavily on a client's individual circumstances such as their investment objectives, risk tolerance, time horizon, liquidity needs and tax situation. For example, an investor with a long-term horizon and high risk tolerance may be suited to more aggressive strategies, while a risk-averse investor may prefer lower-risk assets. Investments can be made either directly (eg, purchasing individual securities) or indirectly through pooled investment vehicles – the choice between these methods will depend on factors such as the client's level of expertise, desire for diversification and cost considerations, for example. We consider suitability assessments (based on a client's circumstances) in chapter 2, and different asset types (both direct and indirect) in chapters 4 and 5 respectively.

Additionally, investment management requires an understanding of macro-economic factors, market trends, and the diversification of assets to reduce risk – which is covered in chapter 7.

Overall, investment management is a dynamic process that seeks to balance risk and return in a way that aligns with the client's unique financial situation and goals. Successful investment management is a personalised and ongoing process, requiring both technical expertise and a deep understanding of the client's financial needs and preferences.

2. Investment Structures & Strategy

Learning Objective

1.1.1 Know the concepts behind: top-down investing; bottom-up investing; active management; passive management; quantamental investment

1.5.1 Be able to assess the main aims and investment characteristics of the following cash, bond and equity portfolio management strategies and styles: indexing/passive management; active/market timing; passive-active combinations

1.5.2 Be able to assess the main aims and investment characteristics of the following cash, bond and equity portfolio management strategies and styles: growth/income/value; market capitalisation; liability driven

1.5.4 Be able to assess the main aims and investment characteristics of the following cash, bond and equity portfolio management strategies and styles: contrarian; quantitative

2.1 Aims, Characteristics and Strategies

The investment management industry plays a key role in helping individuals, institutions and organisations to achieve their financial goals. At its core, the industry involves the management of assets, ranging from equities and bonds to real estate and other financial instruments, with the goal of maximising returns while managing risk. Professionals in this field are responsible for making informed decisions about where and how to invest capital, using various strategies to meet the financial objectives of their clients or stakeholders. Broadly, investors invest their **money** to generate a satisfactory financial return on capital or, at the very least, a return of capital. What is considered a 'satisfactory' return varies not only between assets but also between investors.

For example, a high-risk venture (eg, start-up equity) will typically require a higher return to compensate for the greater risk; while a more stable, low-risk investment (eg, government bonds) may provide lower returns but offer a sense of security.

Additionally, personal preferences play a role in shaping what is deemed satisfactory: some investors may prioritise long-term growth and accept short-term volatility, while others may focus on steady income and capital preservation.

In generating a return, investors can apply two main strategies:

- passive investment management, and
- active investment management.

These approaches differ in how investments are selected and managed. They both offer distinct advantages as well as challenges, depending on the investor's goals and preferences.

2.2 Index-Based Investment Management (Passive)

Index-based investment management (often referred to as 'passive') will be seen in portfolios and funds that are described as **index** trackers.

Passive investors do not take any long-term views on the economic viability of investments; instead, they seek to maximise returns by minimising buying and selling. This is based on the belief that markets are quick to process new information, known as the efficient market hypothesis (EMH) – this is an economic and investment theory that posits all publicly available and relevant information about a particular security is reflected in the price, and this is the security's **fair value**. Thus, investors are unable to gain an advantage over others.

There are several common passive approaches:

Equities	Bonds
• **'Buy and hold'** is primarily a passive investment strategy, where a portfolio of securities is acquired and kept for the long term based on the expectation of value appreciation. Adjustments are rare, although the strategy may involve active decision-making (particularly during periods of heightened market volatility). • **Indexation** (also index matching) replicates the performance of a market index. It may be employed in several ways: ◦ **Full replication** – holding all constituents of an index, weighted according to their market proportions. ◦ **Stratified sampling** – holding a **sample** of securities representative of that index's characteristics.	• **'Buy and hold'** involves purchasing bonds with fixed maturities and holding them to maturity. Investors receive regular interest payments, and return of principal at maturity. • **Cash flow matching** simply purchases bonds to meet liabilities as they fall due. • With **immunisation** (or **duration** matching), an investor buys bonds with a duration equal to any liabilities.

Equities	Bonds
◦ **Factor matching** – selecting securities based on specific characteristics. ◦ **Optimisation** – using sophisticated computer modelling to build a portfolio. ◦ **Synthetic** – entering into swap agreements to track an index's return. • **Rebalancing** involves periodically realigning the weightings to maintain the desired proportions, either by calendar or contingent rebalancing.	• **Laddering** involves buying bonds with a range of different maturities, thus reducing sensitivity to interest rate risk. • **Bullet portfolios** invest in bonds with durations close to a specific liability date – eg, creating a bullet portfolio with equal proportions of nine- and 11-year duration bonds for a liability due in 10 years. • **Barbell portfolios** involve investing in a portfolio of both short- and long-dated bonds, to balance risk – eg, one- and 30-year bonds. • **Combination (or horizon) matching** is a hybrid strategy that involves matching early liabilities with cash flows, and later liabilities with immunisation strategies.

We will now expand on indexation and certain passive bond strategies in more detail below, as these approaches are more commonly employed in standard investment management.

2.2.1 Passive Equity Strategies

Indexation

Indexation is a variant of the 'buy and hold' strategy that eliminates the diversifiable risk and effectively replicates the performance of a market index; hence, it is also known as index matching. There are several different ways of proceeding with respect to indexation, but the most fundamental one is to decide on the appropriate index for the client, as there are many different market indices available.

- An investor may want exposure to large-cap UK stocks, in which case the FTSE 100 is the obvious index to select.
- Alternatively, the investor may be more interested in the large-cap stocks primarily US-based; and for this area, the S&P 500 Index is one of the most appropriate indices.
- As the name suggests, the UK's FTSE 100 consists of around 100 large cap stocks whereas its most closely matched US counterpart comprises 500 different companies.

The duplication of an index by holding all its constituents is also known as complete indexation. The requirement is to match exactly the underlying components of the relevant index, which can often be complex and expensive. For example, the MSCI ACWI Index contains about 2,650 securities from about 50 developed and emerging market countries. To construct a portfolio of all these securities with the same proportions as the index would involve extremely high commissions and dealing costs.

Although the large world indices are relatively stable in terms of their constituents, there is a need from time to time to make changes and modify the components; for example, if a company within the index is taken over by another. Also, the custodians of indices will periodically have to remove some stocks from an index if the **market capitalisation** falls below a certain threshold level and then they will substitute another company which has grown in stature and market capitalisation to qualify for entry to the index.

If a portfolio/fund manager is replicating such an index, where modifications are being made from time to time, then all the changes and re-balancing will need to be made to the replica and this will involve dealing costs and commissions as well as dealing **spreads**. The manner of re-balancing is more critical in some indices than others due to the way in which they are weighted (eg, the S&P 500 is market cap-weighted while the **Dow Jones Industrial Average (DJIA)** is a simple average of the 30 constituent stocks).

Indexation requires a credible and liquid index to track. For example, the FTSE 100 in the UK, the S&P 500 in the US, and China's SSE Composite Index, as well as other global and regional indices (eg, the MSCI World Index). Bond indices include those published by FTSE, Bloomberg, Barclays and Markit iBoxx. Notably, though, bond indices are harder to replicate compared with **equity** indices, for two main reasons:

1. As time passes, the average maturity of a bond index naturally fluctuates due to the inclusion of newly issued ('on-the-run') bonds, while older ('off-the-run') bonds roll off as they mature or are removed from the index. Maintaining the duration characteristics of a portfolio while replacing

maturing bonds with suitable alternatives can be challenging, especially as index compositions are periodically refreshed to reflect market activity, refinancing activity and market dynamics.

2. The universe of bond issuers is huge. While companies typically issue only one type of equity, they may issue several bonds with different maturities, coupons and possibly structures (eg, callable, puttable) as market conditions vary.

For these reasons, full replication of a bond index is often impractical, and they can be more complex and expensive to replicate. Therefore, alternative strategies designed to emulate the index's performance are used.

In this context, stratified sampling can be more appropriate. This involves a portfolio/fund manager dividing the bond index into distinct segments (or 'strata') based on certain characteristics, such as credit rating, sector or maturity. The manager then selects bonds from each stratum in proportion to their weight in the index, which can be more cost-effective and easier to manage compared to attempting to replicate the entire index directly, thus reducing transaction costs and complexity.

Factor matching, optimisation and synthetic replication can also be used to emulate an index's performance:

- **Factor matching** involves aligning the risk factors of the replication portfolio with those of the index, such as interest rate sensitivity, credit exposure or duration.
- **Optimisation** techniques are applied to find the most efficient portfolio, considering constraints such as liquidity and cost.
- **Synthetic replication**, on the other hand, involves using derivative instruments (such as futures or swaps) to replicate the returns of the index, which can be especially useful when dealing with illiquid or difficult-to-access markets. However, synthetic replication also introduces counterparty risk, as it relies on derivative contracts with third-party institutions: if the counterparty fails to meet its obligations, then this could result in a loss for the portfolio/fund.

Notably, whichever strategy is used, indices change their composition over time. For equity indices, for example, firms may fail to meet certain thresholds, go out of business, or be acquired by other companies. For bonds, as mentioned above, bonds mature. When new constituents are added to/removed from an index, the passive portfolio holdings need to be accordingly adjusted immediately to reflect the new index composition.

2.2.2 Passive Bond Strategies

Cash Flow Matching

Cash flow matching is a much simpler approach to portfolio management. The approach is simply to purchase bonds whose redemption proceeds will meet a liability of the fund as they fall due. Hence, it is also known as liability-driven investing (LDI), as it focuses on aligning investment cash flows with future liabilities to minimise the risk of shortfalls.

Starting with the final liability, a bond is purchased whose final **coupon** and redemption proceeds will extinguish the liability. Turning next to the penultimate liability, this may be partly satisfied by the coupon flows arising from bond one, and any remaining liability is matched against the final coupon and redemption value of a second bond. This process is continued for each liability, ensuring that bonds

are purchased where the final coupon and redemption values extinguish the net liabilities of the fund as and when they occur.

The approach outlined is a simple buy and hold strategy and as such does not require a regular rebalancing. In practice, it is unlikely that bonds exist with precise maturity dates and coupons but, intuitively, it is easier to understand.

Immunisation

Immunisation is also employed by bond portfolio managers with a known future liability to meet, but with a key difference from cash-flow matching: rather than matching maturity, immunisation matches duration. An immunised bond portfolio is therefore insulated from the effect of future interest rate changes. By constructing a bond portfolio with the same initial value as the present value of the liability it is designed to meet, and the same duration as this liability, it ensures that it can meet the liability at the required time, regardless of interest rate movements in the interim.

2.2.3 Application and Usage of Passive Investments

Passive investments have become a cornerstone of modern portfolio management, driven by the increasing popularity of ETFs (see section 2.3.1 of chapter 5) and index funds.

The current usage of passive investments is widespread, particularly among long-term investors looking for broad market exposure without the complexity and high costs associated with actively managed funds. Institutional investors, including pension funds and endowments, have increasingly embraced passive strategies due to their efficiency in capturing market returns. Retail investors also benefit from passive investments, which provide a straightforward way to diversify their portfolios, reduce the risk of individual stock picking and avoid mistakes relating to market timing. The growth of robo-advisors (which often rely on passive investment strategies through automated portfolio management services) has further expanded access to these types of funds. However, the trade-off with passive investment is that the investor follows the composition of the index, including if the index becomes increasingly concentrated around a small number of stocks (as has been observed in recent years in the US).

Over the long term, passive funds have the potential to outperform active funds, particularly after accounting for management fees – this is especially true in efficient markets, where it is difficult for active managers to consistently beat the market. Passive investing has become a popular strategy for many investors as a result.

Despite this, some critics argue that passive investing could lead to market distortions, since large flows of capital moving into index-tracking funds could inflate the prices of the largest companies. Nevertheless, passive investing has become a dominant force in global financial markets.

2.2.4 Advantages and Disadvantages of Passive Investing

The advantages and disadvantages of employing passive investment management strategies are as follows:

Advantages	Disadvantages
• Passive investing brings about reduced marketing, distribution and accounting costs, thus lower fees overall. • Passive funds are liquid, so investors can build on their positions or access their funds when needed. • Investing passively is very transparent, as it is always clear which assets are held in the index. • Underlying index constituents are rebalanced frequently. • A wide variety of indices are available, to suit a broad range of investing styles and risk tolerances.	• When adjusting portfolios to reflect constituent changes, investors may end up buying (or selling) securities at elevated (or depressed) prices. • Investors are unlikely to employ any risk management strategies, so they can never outperform the index that they follow. • Passive strategies can be overly concentrated, which can leave money vulnerable to major political and regulatory events. • Indexed portfolios are still exposed to market risk and will likely follow the index down in bear markets.

2.3 Active Investment Management

In contrast to passive equity management, active equity management seeks to outperform a predetermined benchmark over a specified time period for an appropriate level of risk. This is based on the belief that investors are emotional and irrational, and regularly display a 'follow the herd' mentality such that they buy too high and sell too low. Active investors believe they can profit by identifying stocks trading at prices below their value merits.

There are two methods of constructing portfolios using an **active management** technique:

- **Top-down** active investment management involves portfolio/fund managers considering the big picture first by assessing the prospects for each of the main asset classes within each of the world's major investment regions against the backdrop of the world economic, political and social environment. This output then drives the **asset allocation** decision.
- A **bottom-up** approach to active management describes one that focuses solely on the unique attractions of individual stocks. Managers applying the 'bottom-up' method of portfolio construction pay no attention to index compositions. Bottom-up methods are usually dependent on the style or approach of the individual manager or team of managers. In doing so, investors may utilise:
  - **Fundamental analysis** measures a company's intrinsic (or 'fair market') value based on financial analysis of a company's published accounts – eg, revenues, profits, costs and return on equity. It also involves an analysis of its management, markets and competitive position. Economic factors can also significantly affect a company's business. If the fair market value is above the price the security is trading at, it is deemed to be undervalued, and vice versa.

- **Technical analysis** also seeks to evaluate the value of a company, but instead of analysing a company's intrinsic value and prospects, it uses historical price and volume data to assess where the price of a security or market will move in the future. This approach is based on the belief among many technical analysts that a security's past trading activity and price changes are valuable indicators of **future price** movements. In essence, technical analysts use different quantitative and statistical tools to analyse time-series data of asset prices, behaviours and other characteristics, with a view to discerning recurrences of similar price-development patterns or chart formations. See chapter 6, section 6.4.

While fundamental and technical analysis share the same goal (of identifying profitable investment opportunities), they differ widely in their approaches. The principal differences between them can be summarised as follows:

- **Analysing financial statements versus charts.**
  - At a basic level, fundamental analysis involves the analysis of the company's statement of financial position, comprehensive income and cash flows.
  - Technical analysis considers that there is no need to do this, as a company's fundamentals are all accounted for in the price, and the information needed can be found in the company's charts.
- **Time horizon.**
  - Fundamental analysis takes a relatively long-term approach to investment.
  - Technical analysis uses chart data over a much shorter time frame of weeks, days and even minutes.
- **Investing versus trading**
  - Fundamental analysis is often used to make long-term investment decisions.
  - Technical analysis is often used to determine short-term trading decisions.

Although the approaches adopted by fundamental and technical analysis differ markedly, they should not be seen as being mutually exclusive techniques. Indeed, their differences make them complementary – investors may be wholly bottom-up, but may also consider top-down factors in choosing securities. For example, the coronavirus (COVID-19) pandemic influenced investors' attitudes towards technology and healthcare stocks. Used collectively, therefore, these approaches can enhance the portfolio management decision-making process. The various metrics associated with fundamental analysis are covered in chapter 3, section 3.

Active investors can employ a variety of investment styles to achieve their aims:

Equities	Bonds
• **Growth investing** targets companies with above-average growth potential. • **Value investing** focuses on undervalued companies that are set for recovery. • **Blend investing** combines growth and value investing, thus offering both styles' potential benefits and risks. • **Contrarian investing** identifies opportunities where the market has overreacted to a particular situation. • **Income investing** often focuses on mature companies paying regular dividends. • **Trend investing** seeks to achieve gains through analysing an asset's price momentum. • **Quality investing** focuses on companies with strong fundamental characteristics (eg, high return on equity, low debt-to-equity, strong free cash flow). • **Absolute return investing** aims for positive returns in all market conditions.	• **Duration switching** adjusts portfolio duration based on interest rate expectations. • **Riding the yield curve** involves buying a long-term bond but selling it before maturity, to profit from a declining yield over the bond's life. • **Bond switching** (or swapping) involves exchanging one bond for another. The main types are: ◦ **Anomaly switching** moves between similar bonds differing only in yield and/or price, switching from the expensive to the cheaper bond. ◦ **Policy switching** exchanges dissimilar bonds, to take advantage of anticipated changes in interest rates, credit ratings and other factors. ◦ **Intermarket spread switching** moves between government and corporate bonds with different terms to obtain a more positive yield spread.

We will now expand on some of these active and bond strategies in more detail below.

2.3.1 Active Equity Strategies

Growth Investing

A growth investing strategy looks for companies with consistent, above-average earnings and revenue growth. As a result, growth investors are willing to pay a **premium** for a stock now because they believe the company will grow faster in the future. This leaves growth companies with a higher P/E ratio; growth investors are willing to pay a higher price now for long-term future earnings growth.

True growth stocks are those that can differentiate their product or service from their industry peers so as to command a competitive advantage. This results in an ability to produce high-quality and above-average earnings growth, as these earnings can be insulated from the business cycle. A **growth stock** can also be one that has yet to gain market prominence but has the potential to do so.

Value Investing

The oldest style, based on the premise that deep and rigorous analysis can identify businesses whose value is greater than the price placed on them by the market. By buying and holding such shares often

for long periods. A higher return can be achieved than the market average. Managers of equity income or income and growth funds often adopt this style, since out of fashion stocks often have high dividend yields.

Income Investing

Income investing aims to identify companies that provide a steady stream of income. Income investing may focus on mature companies that have reached a certain size and are no longer able to sustain high levels of growth. Instead of retaining earnings to invest for future growth, mature firms tend to pay out retained earnings as dividends as a way to provide a return to their shareholders. High dividend levels are prominent in certain industries such as utility companies. The driving principle behind this strategy is to identify good companies with sustainable high dividend yields to receive a steady and predictable stream of income over the long term. Because high yields are only worth something if they are sustainable, income investors will also analyse a company's fundamentals to ensure that its business model can sustain a rising dividend policy.

Contrarianism

The concept behind contrarian investing is that high returns can be achieved by going against the prevailing trend. When the consensus of the majority of investors or traders is strongest, the individual trader should consider doing the opposite of what the crowd is doing. For example, when the market is strongly bullish, the contrarian view suggests it may be more prudent to short the market; and when consensus is bearish, it may signal to prepare for buying.

Mass psychology often drives market trends for extended periods, making it challenging to pinpoint the moment when optimism or pessimism has reached its extreme. Investors subscribing to the contrarian approach ask: *how can one identify when the consensus is at its strongest and determine the best time to act?* There is no definitive method to time such decisions or to empirically verify that consensus acts as a reliable contrarian indicator for profitable outcomes. Generally, though, contrarian investors aim to apply detailed research and sound judgement to achieve potentially higher returns.

2.3.2 Active Bond Strategies

Riding the Yield Curve

Riding the yield curve is an active bond strategy that does not involve seeking out price anomalies but this is only a valid strategy when the yield curve is upward sloping. For example, if a portfolio manager has a two-year investment horizon, then a bond with a two-year maturity can be purchased and held until redemption. Alternatively, if the yield curve is upward-sloping, and the manager expects it to remain upward-sloping, without any intervention or anticipated interest rate rises over the next two years, a five-year bond can be purchased and sold two years later when the bond has a remaining life of three years. This rate anticipation method may use horizon analysis to project a bond portfolio's expected returns over several time frames, or investment horizons, to arrive at a more realistic expectation of performance from different bond strategies.

Assuming that the yield curve remains static over this period, the manager benefits from selling the bond at a higher price than that at which it was purchased as its GRY falls.

Bond Switching

Bond switching takes three forms:

- **Anomaly switching** – this involves moving between two bonds similar in all respects apart from the yield and price on which each trades. This pricing anomaly is exploited by switching away from the more to the less highly priced bond.
- **Policy switching** – when an interest rate cut is expected but not implied by the yield curve, low duration bonds are sold in favour of those with high durations. By pre-empting the rate cut, the holder can subsequently benefit from the greater price **volatility** of the latter bonds.
- **Intermarket spread switching** – when it is believed that the difference in the yield being offered between corporate bonds and comparable government bonds is excessive given the perceived risk differential between these two markets, an intermarket spread switch will be undertaken from the government bond market to the corporate bond market. Conversely, if an event that lowers the risk appetite of bond investors is expected to result in a **flight to quality**, government bonds are purchased in favour of corporate bonds. This is just one example of intermarket spread switching; other types of spread switching involve movements between bonds with varying terms, sectors or credit qualities.

2.3.3 Quantitative Investing

Quantitative (quant) investing is an active investment strategy where computer models drive the stock-selection process. A pure quant investor relies solely on computer models to make this stock selection. This is known as Systematic Investing.

With quant investing, there is no place for a manager's judgement based on **fundamental analysis**. Instead, investors use pre-determined or pre-set models to undertake this stock selection process. Such models sometimes rely on ideas such as **modern portfolio theory (MPT)** and the capital asset pricing model (CAPM), which are covered in sections 10.2 and 10.3 of this chapter, in order to determine which stocks to hold and in what proportions. Sometimes the models are more based on the identification of patterns as discussed in conjunction with technical analysis.

Typical strategies of quant investors are:

- growth strategies
- value strategies
- statistical **arbitrage** strategies
- **correlation** strategies
- long/short equity strategies
- dispersion strategies.

It used to be observed that quant strategies tend to perform better in market downturns, whereas more fundamental strategies perform better in upswings. Based on correlations and exploiting convergence or mean reversion strategies, quant strategies assume that the historical statistical relationships between stocks will continue into the future, which clearly may not hold true. Their experience in the recent market downturns is leading many to question whether this still holds.

Long/Short Equity Strategies

When an investor purchases a share, they have a 'long' position. When the investor sells shares that they do not own, they have a **short position**. However, with the use of **derivatives**, these scenarios somewhat change.

Using **options** as an example. Buying a call or buying a put gives the holder the right to buy (call) or sell (put) a stock at a pre-agreed price. Both scenarios are **long positions**. Conversely, selling call or selling a put hands over the right to the buyer to buy (call) or sell (put). Both scenarios are short positions.

A short investor can borrow the shares (for example, within a margin account) so that the buyer receives their shares. The motive here is to hope that the price falls and the shares can be repurchased at a lower price, thus making a profit.

For an options trader who predicts the share price will fall, buying a **put option** will yield a profit as the option is sold to close the position at a higher price.

The key difference between both strategies is the amount of leverage. This is simply illustrated as follows:

Shares

Sell 100 ABC plc @ £1. Consideration £100

Buy 100 ABC plc @ 80p. Consideration £80

Profit = £20.

Put Option

Buy 1 lot of £0.95 put options @ 10p. Each option is for 1,000 shares.

Cost = 1000 x 10p = £100.

Sell 1 lot of £0.95 put options @ 20p. Proceeds = 1000 x 20p = £200.

Profit = £100.

2.3.4 Quantamental Investing

The terms 'quantamental' is a portmanteau of 'quantitative' and 'fundamental'. It is effectively an investment strategy combines these two approaches, aiming to improve returns by utilising both artificial intelligence (AI) and traditional human insight – in other words, a combination of human and machine to devise investment strategies.

Quantamental investing has become a wide-ranging term covering a span of different investment methods from complex IT programmes and high-speed trading (HST) to much simpler approaches.

The move to quantamental investing has, and continues to, necessitate significant behavioural and cultural change in an industry that continues to see technology playing an increasingly dominant and influential role in investment companies. While there is a potentially significant cost (for example, the cost of data), the transition to using quantamental investing may be a 'must do' if they have a better chance of surviving, evolving and thriving.

2.3.5 Advantages and Disadvantages of Active Investing

The advantages and disadvantages of employing active investment management strategies are as follows:

Advatanges	Disadvantages
• It can generate greater returns than the market. • Investors can tailor an active strategy to meet specific investment goals. • They have the flexibility of choice, allowing them to reduce risk. • Active investing can offer a challenge, which some investors may enjoy, and allows them to be more involved in managing their money.	• Better performance is not guaranteed. • Investors must be continuously vigilant about the performance of their investments, so active investing can be hard work and time consuming. • Fees for professionally managed portfolios tend to be high, which has a compounding effect over time. • Some actively managed funds may be 'closet trackers'.

2.4 Passive and Active Combinations

Notably, passive and active strategies are not mutually exclusive. Rather, a combination of different styles can be incorporated by investors, some examples of which we will now consider.

2.4.1 Core/Satellite

This is an investment strategy designed to minimise cost, volatility and tax liability, while providing an opportunity for outperformance. This is achieved by incorporating traditional securities in passively managed funds (core), to be held for the long term: this is typically 70–80% of the portfolio's value, to minimise the risk of underperformance. The balance is then held in several specialist actively-managed funds or individually selected securities (satellite), comprising holdings that the investor expects will outperform the market and which are fine-tuned over time.

The core can also be run on an enhanced index **basis**, employing specialist investment management techniques to add value. These include stock lending and anticipating constituents' entry and exit from the tracked index. In addition, indexation and active management can be combined within index tilts: rather than holding each constituent in strict accordance with its index weighting, they are marginally overweighted or underweighted relative to the index, based on their perceived prospects.

2.4.2 Smart Beta

Traditional active and passive funds help investors achieve their investment goals, but a newer alternative aims to combine the benefits of both approaches into one product. It goes by many names, including enhanced indexing, smart **beta**, strategic beta, fundamental indexing and factor investing.

The key difference between a smart beta fund and a traditional index fund is that a smart beta fund does not track a market capitalisation-weighted index but, instead, tracks an index based on fundamental characteristics. These characteristics are grouped into two main categories, macroeconomic factors and style factors, as follows:

Macroeconomic factors	Macroeconomic factors capture broad risks that exist across asset classes: • economic growth • real interest rates • **inflation** • credit • emerging markets, and • **liquidity**.
Style factors	Style factors capture risks and returns within asset classes: • minimum volatility • momentum • value • quality, and • size.

Individual factors are typically driven by different market phenomena and, therefore, tend to be rewarded in different market environments and **economic cycles**. Smart beta will typically target more than one factor to provide opportunities to seek improved returns, reduced risk or enhanced diversification.

By systematically tilting investment exposures toward factors within an index framework, smart beta strategies combine the characteristics of both active and passive investing: the creation of a custom benchmark consisting of stocks that exhibit certain behaviours is the active part of the strategy, and this then becomes the passive strategy as the fund tracks that benchmark.

2.4.3 Smart Alpha

Smart alpha funds aim to benefit from an investor's best investment ideas, independent of market movements. The way in which smart alpha works is very similar to smart beta in that an investor creates a custom benchmark (active) that tracks their best investment ideas (passive). However, a key difference is that the index's exposure to the wider market (ie, beta) is hedged out, thus enabling the strategy to capture pure alpha. A smart alpha strategy is, therefore, 'market neutral' – in other words, it does not move with the broader market but, instead, follows the performance of the investor's individual ideas.

As opposed to passive strategies, enhanced index strategies aim to outperform traditional benchmarks, however at significantly lower levels of **active risk** than typical active strategies. Smart beta and smart alpha can, therefore, be considered a middle ground between a purely active and a purely passive approach.

The cost efficiency of these strategies is particularly important, given increasing pressures from fees, which have brought cost considerations to the forefront of investors' minds. Over the years, the relatively higher fees incurred from traditional active management strategies have prompted investors to seek strategies that offer similar performance potential, but without the associated premium fees.

Additionally, the pressure for portfolio/fund managers to manage costs efficiently has never been higher. Investors are increasingly aware of how fees can erode long-term returns, especially in low-return environments. As a result, there is growing demand for strategies that blend the best of both worlds – ie, that can deliver cost-efficient exposure to factors that drive performance, while minimising the risks and costs typically associated with traditional active management.

These passive-active combinations are often seen as an effective solution to this issue, offering a lower-cost alternative that still allows investors to pursue outperformance. Additionally, these strategies typically have lower turnover rates, which can further reduce transaction costs and tax liabilities, thus making them even more attractive to cost-conscious investors.

Investors considering these types of funds need to understand the index construction that underpins a fund as similar sounding funds may produce different results.

2.5 Market Capitalisation

A company's market capitalisation (or market cap) measures its value based on the number of shares in existence multiplied by the share price. It allows investors to determine how valuable a company is (the price established by market supply and demand).

For example, if a company has issued 100 million shares and its share price is £10, its market capitalisation is £1 billion. The figure for the shares outstanding will include all public shares plus any that may be held privately and may be classed as restricted shares.

If a company were to try to buy out a large company, it would usually have to pay a premium over and above the market capitalisation. For example, a predator company might have to pay £50 billion in order to succeed in a takeover bid for a company with a market capitation of £40 billion.

Listed companies are grouped according to their size: small cap, mid cap and large cap. Note that the definition of a small, mid and large cap company differs depending on the source, and will fluctuate over time as stock markets rise and fall. Generally, though, large caps are often multinational businesses, so they are exposed to the global economy and movements in foreign currencies; while small caps are young and potentially fast-growing companies that have the potential to generate large returns over time.

It is important to note that a large-cap company in one economy may be categorised as a small cap in another, depending on the relative size of the economy and the market capitalisation thresholds used.

For example, a company with a market cap of £10 billion might be considered to be a large cap in the UK, but could be classified as mid- or even a small-cap company in the US.

The value of a company can determine the amount of risk an investor takes when investing, so the market cap can help create a balanced portfolio in accordance with the investor's investment mandate. Investment funds also use market cap data in order to determine if they have the correct weightings in both individual companies and cap groupings.

Some of the general features of the capitalisation grouping of companies are summarised below:

Large Caps	Mid Caps	Small Caps
• Less volatile. • Attractive to less risk averse investors. • Dividend payments are more reliable. • Less 'headline grabbing'.	• Often more local companies. • Less international reach. • Opportunity for investors for higher, faster gains. • More risk of dramatic share price downturns.	• Often newer companies. • Narrower range of revenue streams. • More impacted by economic conditions and regulation. • Often newer companies. • High growth potential but also large loss potential.

3. Collective Investments and Specialist Investment Structures

Learning Objective

1.2.1 Know investment activities associated with: pension funds and patient capital; life assurance funds; hedge funds; retail investment funds; family offices; managed futures funds; money market funds; manager of manager funds

One way in which investors can access active and passive investment strategies is through collective investments and specialist investment structures. These vehicles provide diversified exposure to various asset classes while catering to different risk appetites and objectives. Collective investment schemes, (also called 'collectives' 'CISs' or, 'pooled investments') are financial intermediaries that combine and pool the financial resources of many investors to create a larger, diversified portfolio of assets. Specialist structures (eg, hedge funds, managed futures funds and patient capital vehicles) often adopt unique strategies to achieve specific outcomes, such as capital preservation or enhanced returns.

By understanding the characteristics of these investment options, investors can align their strategy with their financial goals.

Retail investment funds – eg, unit trusts, open-ended investment companies (OEICs), exchange-traded products (ETPs) and investment trusts – as well as hedge funds, managed futures funds, money market funds and manager of manager (MoM) funds are all covered in chapter 5.

3.1 Patient Capital

Although there is no firm definition of patient capital, it is generally associated with long-term investment (spanning from three to five years, to as much as ten to 15 years). Patient capital is commonly found in pension funds and sovereign wealth funds (SWFs). In recent years, the concept has been associated with environmental, social and governance (ESG) factors, and ethical and impact investing. Fund managers often endure short-term losses, in order to benefit from sustained long-term growth. Patient capital funds will often accept a higher risk profile, as they support entrepreneurs in creating sustainable business models that promote long-term growth.

Patient capital funds will often accept a higher risk profile, as they support entrepreneurs in creating sustainable business models that promote long-term growth.

Following the 2016 vote for the UK to leave the EU (termed 'Brexit'), the government tasked HM Treasury and the Department for Business, Energy & Industrial Strategy (BEIS) to provide a Patient Capital Review, followed with a government consultation: 'Financing Growth in Innovative Firms'. The UK Treasury said that UK defined contribution pension schemes are to be given opportunities to invest in start-ups and small, growing domestic companies. The Head of UK Treasury said that some of the biggest defined contribution (DC) funds had already pledged to work with the British Business Bank to invest in this sector of the economy:

> *'With total asset value predicted to reach £1 trillion by 2025 defined contribution pension schemes will have a huge role in the area of financing UK growth and innovation.'*

In response to the Patient Capital Review, the British Business Bank established British Patient Capital (BPC) in 2018, with a £2.5 billion investment fund allocated over 10 years. The aim of BPC is to unlock billions in additional private investment to support high-growth, innovative companies. Also in 2018, the **Financial Conduct Authority (FCA)** proposed a change to further enable retail investors to invest in patient capital through unit-linked funds. The FCA also committed to exploring how UK-authorised funds can be used to invest in patient capital.

3.1.1 Long-Term Asset Funds (LTAFs)

Long-term asset funds (LTAFs) can be considered a form of patient capital, as they are specifically designed to provide investors with access to long-term, illiquid assets. Examples include infrastructure projects, private equity, property and other alternative investments that require extended holding periods to realise their full value.

The LTAF structure was introduced in the UK by the FCA in 2021 to address the liquidity mismatch in open-ended funds directly invested in illiquid assets. For example, while it can take several months from initial marketing to completing the sale of direct properties held within an open-ended fund, a fund manager typically has just four business days to remit the sale proceeds to an investor following an instruction to sell units/shares. This mismatch creates a clear opportunity cost for investors.

The FCA therefore introduced LTAFs as a category of authorised open-ended fund that require investors to provide notice of at least 90–180 days (if not longer) to redeem their units/shares. Additionally, LTAFs are prohibited from permitting redemptions more frequently than monthly (among other liquidity

tools). In addition to being authorised by the FCA, LTAFs have their own chapter of rules within the FCA Handbook (COLL 15).

LTAFs are particularly relevant for institutional investors such as pension funds, endowments and other entities with long-term liabilities. These investors can tolerate illiquidity in exchange for potential higher returns. Additionally, LTAFs align with broader trends in responsible and sustainable investing, where long-term capital can drive positive change and support economic resilience.

3.2 Life Assurance-Based Investments

A life assurance policy can be considered a wrapper within which are held some form of investment. Some of the basic principles of life assurance policies are noted below.

3.2.1 Basic Principles of Life Assurance

- **Life assurance proposer** – the person who proposes to enter into a contract of insurance with a life insurance company to insure themselves or another person on whose life they have an insurable interest; in other words, they must have an interest in that person remaining alive or expect financial loss from their death.
- **Life assured** – the person on whose life the contract depends. Although the person who owns the policy and the life assured are frequently the same, this is not necessarily the case. A policy on one person's life, but affected and owned by someone else, is called a 'life of another' policy. A policy affected by the life assured is called an 'own life policy'.
- **Single life** – a policy that pays out on the life assured's death or if some other insurable event occurs, such as if they are diagnosed with a terminal illness and have critical illness cover.
- **Joint life** – a policy that pays out following the death of either the first or second life assured. These policies typically protect financial dependants, with the sum assured paid on the first death; an alternative is two single life policies, whereby each person is covered separately. If both lives assured die simultaneously, the full benefits of both policies would be paid. If one life assured dies, the surviving partner maintains their coverage. While two single life policies provide more extensive coverage, they tend to cost more (although not double), therefore making them better value for money.

A wide range of variations on the basic life policy are driven by mortality risk, investment and expenses and premium options, all of which impact on the structure of the policy itself. Mortality risk deals with the insured's expected life, whether any additional charges might be imposed, and the level of risk borne by the life company, which can affect the cost of the cover provided.

Life assurance-based investments typically follow one of three structures; non-profit, with-profits and unit-linked.

3.2.2 Types of Life Assurance Policies

- **Non-profit** policy is one that is for a guaranteed sum only, where the insured sum is chosen at the outset and is fixed.
- **With-profits** policies pay a guaranteed amount, plus any profits made between the policy being taken out and death. They are typically used to build up a sum of money to buy an **annuity** or pension on retirement, to pay off the capital of a mortgage, or, in the case of whole-of-life assurance, to insure against an event such as death. One advantage of with-profits schemes is that profits are locked in each year. If an investor bought shares or bonds directly, or within a unit trust or investment trust, the value of the investments could fall just as they are needed because of general declines in the stock market. With-profits schemes avoid this risk by 'smoothing' the returns; that is, in years when the underlying portfolio performs well, the company will hold back some of the gains, and allocate them to policyholders to boost their returns in years when performance is poor. The concept behind this is that policyholders should experience lower volatility than with a regular investment.
- **Unit-linked** policies are ones where the return will be directly related to the investment performance of the funds contained within the policy; these may be units in the insurance company's fund or externally managed investment funds. The amount invested is used to buy units in a fund run by the life company, or in external funds run by fund management groups. The policy's value is measured in terms of the total number of units allocated to it, and the value of these units depends on the performance of the underlying investments.

The value of the bond generally fluctuates in line with the underlying investments. Generally, life companies offer a range of unit-linked options, with different risk profiles. These may include government or other bond funds, equity funds, and other variants. In many cases, the policy has no minimum maturity value; instead, its value is linked directly to the underlying funds.

With-profits endowments also offer a benefit payable at some future maturity date, or on the earlier death of the policyholder, or on encashment by the policyholder. The policyholder pays single or regular premiums to the life company, which invests them in the markets to generate sufficient capital to pay the death or maturity benefits. To achieve a return, the life office invests the premiums received from its many with-profit policyholders in the mix of investments it thinks is most appropriate. These include equities, debt securities, property and cash: in some cases, it can also include other assets, such as holdings in hedge funds, foreign currencies and other **alternative investments**. The portfolio is generally constructed so as to avoid too high a degree of risk.

The policyholder receives a basic sum assured, plus a share in any investment profits made by the life company. These profits are shared by way of bonuses:

- **reversionary bonuses** – which are added each year and, once paid, cannot be withdrawn, and
- **terminal bonuses** – which are awarded on maturity or earlier death.

3.3 Family Offices

Family offices are wealth management firms that offer a range of services to one or a small number of ultra-high-net-worth individuals (UHNWI) – in other words, individuals with a net worth of at least $30 million. Family offices are usually single-family offices (SFOs), or multi-family offices (MFOs); a MFO would not be dissimilar to regular private wealth managers serving several clients which would benefit from **economies of scale**.

The family office is considered a relatively new concept in Europe, whereas in the US family offices have been around for many years. Since 2000, there has been a significant rise in the number of family offices, which have become largely the norm for wealthy families in order to manage their financial and non-financial lifestyles and needs. They are becoming increasingly diverse and sophisticated.

Family offices offer a full range of wealth management services such as investment services, wealth planning/budgeting, tax planning, insurance, charitable donations, tax services, wealth transfer and inheritance planning. They also offer other services according to family demand, which we will look at in section 3.3.1 below.

They will tailor a wide range of services to suit the needs of the family/families. Further, they often have a team of specialists for services such as tax efficient set up of family or children's trusts and succession planning, as well as other family services such as schooling or travel.

3.3.1 The Many Services and Disciplines of a Family Office

Providing complex services to ultra-wealthy families would usually be beyond the capabilities of a regular adviser. It requires a well-organised and competent effort by a team of professionals with the necessary experience in matters such as insurance, investment, property and taxation.

- **PA services** – where the family requires daily help with family administration and activities such as arranging travel and flights, drafting and mailing letters and even looking after pets! These needs are largely non-financial.
- **Legacy management** – servicing families with a large amount of accumulated and inherited wealth. This might involve complex tax planning, transferring assets and business interests and tax efficient disposals. This would also include the setting up and managing the family's trusts. Part of the service would be ensuring that all impacted family members fully understand all arrangements and planning matters.
- **Lifestyle management** – these services involve more than just PA services. The office would deal with such things as employment of household staff and their management, insurance of family assets, support of chosen charities, and arranging personal security. In addition to managing lifestyle needs, the family office will also manage financial matters such as paying bills, paying staff salaries, cash deposits/longer-term deposit accounts, and sometimes acting as the family's accountant and bookkeeper.
- **Financial adviser services** – the trusted family adviser service involves wealth and tax planning, liquidity forecasting, asset distribution, and cross-generational wealth transfer. Using discretionary services, the object is also achieving a client's required return on investment. The offices are usually remunerated on their overall investment performance.

The laws of some countries allow for only one legal form for collective investments, while others allow for more than one. Luxembourg, the largest centre for fund domicile outside of the US, recognises both corporate and contractual forms – a SICAV is the corporate form, and the FCP is the contractual one.

4. Investment Solutions and Ancillary Activities

Learning Objective

1.2.2 Know: the purpose of a centralised investment proposition; the different types of fund structure and underlying corporate structures

1.3.1 Know the facilities offered by: model portfolio service (MPS) providers; discretionary fund management (DFM) service providers; prime brokers; transfer agencies

Investment firms offer a range of investment solutions and supplementary services, designed to meet the diverse needs of clients in terms of their financial goals, risk profiles and levels of experience, among other considerations. The level and complexity of services provided by a firm can vary significantly – for example, discretionary fund management (DFM) for high-net-worth individuals (HNWIs), or more standardised, lower-cost options (eg, model portfolios) for retail clients. Whichever services are offered, firms must ensure that their offerings are suitable for their clients' needs, and comply with regulations designed to protect consumers.

4.1 Centralised Investment Proposition

A centralised investment proposition (CIP) allows investment managers to provide a standardised approach to investment advice, meeting the needs of clients. Within a firm, a CIP is a centrally constructed selection of investments.

A CIP also allows an investment manager to provide a consistent and robust approach and can remove the 'heavy lifting' from undertaking research, helps remove bias and leads to spending more time providing good wealth management planning with a first-class service.

That said, a CIP will not be suitable for all clients who may have differing needs and objectives. At all times, a firm must have a sound basis for believing its clients have the right experience and knowledge to understand both the nature of the risks of any investments within the CIP. The CIP has to be suitable; it is never an acceptable practice to force clients into a CIP offering.

4.2 Investment Solutions

Investment firms offer a range of solutions to cater to varying client requirements, from tailored portfolios to low-cost, broad market exposure. These solutions can be structured to provide varying levels of advice, management, and investor control.

- a bespoke portfolio for clients that need a tailored approach
- a model portfolio service for clients who would benefit from active management but who do not require a full bespoke service

- a portfolio of low-cost mutual funds for clients who require a low-cost ongoing service, or
- a portfolio of mutual funds or managed solutions, such as multi-asset and **fund of funds**, for clients seeking an easy way to access broad market exposure.

Many investment firms run portfolios of investment funds targeted at different investment objectives such as growth, balanced, or income. These portfolios are regularly monitored and adjusted depending on market movements and fund manager changes. The approach is return focused and aims to meet or exceed a benchmark target. In the case of model portfolios, an investment firm may construct and manage these portfolios itself or outsource the investment activity by using a **multi-manager fund** solution.

As a generation, these solutions fall within the following types of structure:

- **Discretionary basis** – the client gives discretion for a firm to manage a portfolio on their behalf on a professional basis; in other words, the firm does not have to refer to the client before dealing. Clients may wish to use this type of service if they are too busy or not experienced enough to look after their own investments and prefer to use the investment experience of a firm providing these services.
- **Non-discretionary basis** – there are two types of non-discretionary services:
  - **Advisory** – clients rely on the firm for professional and independent advice on investment decisions, but the client takes the final decision to deal. Clients can deal in a wide range of investments, and the firm will aim to build long-term relationships with them.
  - **Execution-only** – no advice is given to the client, and the firm simply undertakes the transaction. In such cases, the transaction is carried out on the client's instructions, and no advice is provided about the suitability or appropriateness of the investment. In some regions/countries, though, firms may have to request information from clients (or potential clients) on their knowledge and experience, in order for them to assess whether the execution-only service is appropriate.

4.3 Prime Brokerage

Prime brokerage is the name of a suite of different services that a prime broker provides to its clients, usually hedge funds.

Hedge funds are investment funds that are normally available to a restricted number of high-net-worth/value investors. They will engage in quite complex investment strategies, such as simultaneous trading in both long and short positions (ie, selling shares they do not own); the hedge fund manager will hope that any profit made on one leg of the transaction will more than compensate any loss made on the other.

Most hedge funds also sell securities short with the hope of buying them back cheaper at a later date. This will inevitably involve the hedge fund having to borrow the sold securities until they are bought back.

A successful prime brokerage will make significant use of stock borrowing and lending and act on behalf of the hedge fund or other alternative investment managers.

4.3.1 Prime Brokerage Services

The traditional core services of a prime brokerage are:

- clearing, settlement and custody
- margin finance
- securities lending, and
- consolidated reporting.

A prime broker also often offers the following services:

- Securities borrowing and lending, usually a key component of the broker's offering, as well as using the fund's long positions to lend to others and provide additional income for the fund.
- The execution and administration of the fund's investment strategies, including core settlement and custody/asset servicing.
- Treasury management facilities for the fund's cash.
- Securities financing (ie, lending cash to the fund against a pool of collateral).
- Leveraged trade execution and accompanying margin requirements and handling.
- **Repo** financing.
- Synthetic financing, where the prime broker creates exposure to certain securities by the use of derivatives, such as swaps and futures/options.

4.4 Transfer Agencies

A transfer agent is usually a bank, trust company or other institution that maintains investors' financial records in respect of holdings of fund units.

It will record transactions, cancel and issues certificates (where they exist) and handle shareholder mailings. They also ensure investors receive dividends, interest and redemption payments, as appropriate.

If investors hold funds in their own names and wish to transfer them, the transfer agent will affect the changes on the fund register.

An agency may also be responsible for the oversight of anti-money laundering (AML) documentation and the settlement of acquisitions and disposals.

4.5 Securities Financing (Stock Borrowing and Lending)

Learning Objective

1.3.2 Understand how stock lending operates and the risks involved

Securities financing is the act of borrowing or lending cash or securities against collateral. The securities lending market is driven by demand from firms wishing to borrow securities and begins largely with the trading activities of dealers and hedge funds. Securities lending describes the common market practice by which securities can be transferred on a temporary basis from one party to another, with the borrower undertaking to return them either on demand or at the end of any agreed length of time.

Loaned securities are generally used to enable firms to take active positions, hedge against counterparty risk vis-à-vis a short sale, or facilitate the settlement of trades that would otherwise fail (and possibly incur settlements fines).

An asset owner that chooses to lend its securities can enhance the returns on its portfolio by receiving a fee for making its investments available to a borrower. Such transactions can boost the overall returns on, for example, a pension fund and insurance companies – see section 3.4.1.

Fees are distributed among the parties involved based on their roles in the transaction:

- The lender receives a lending fee from the borrower for making their securities available. Lenders are usually large institutional investors such as pension funds, sovereign wealth funds, charities, insurance companies and a range of collective investment funds.
- Lenders can either lend securities directly to borrowers or use a third-party intermediary (eg, a custodian bank or intermediary), known as a securities lending agent. The securities lending agent takes a percentage of the fee as commission for ensuring collateralisation and handling administrative processes. Collateralising the loan protects the lender against both counterparty risk and market risk; usually, the lender will seek collateral from the borrower in the form of cash or other securities of equal or greater value than those lent.
- After the agent's commission is deducted, the remainder of the lending fee is passed to the asset owner.

4.5.1 Key Participants and Benefits

The main supply of securities in the lending market comes from portfolios held by pension funds and insurance companies. The benefit to lenders is the ability for them to earn income by lending their securities on to third parties for either a fee or by earning interest (where rates are sufficiently positive) on cash collateral provided by the borrower.

The demand for borrowing securities is generally in relation to the trading activity of dealers and hedge funds who are either short selling or have a requirement to borrow due to a deliberate trading strategy, like arbitrage.

In the lending industry, different types of intermediaries act on behalf of, and arrange loans for, both parties. Intermediaries include custodian banks and asset managers lending securities as agents on behalf of beneficial owner clients.

Specialist securities lending agents are known as stock borrowing and lending intermediaries (SBLIs). These firms arrange for one party (perhaps a proprietary trading firm or market maker) to borrow shares from a lending party (eg, a pension fund). These specialists generally share revenues with the underlying lenders.

Market makers have an obligation to provide liquidity to the market by openly quoting the prices at which they are prepared to buy and sell. When there are more buyers than sellers in the market and a security is in demand, it would not be unusual for a market maker to have sold more stock than it has bought, ie, they become 'short' of the security – this then creates a requirement for the market maker to borrow the security until such time the short position is closed.

International central securities depositories (ICSDs), such as Euroclear Bank and Clearstream, run 'auto-lending' programmes that allow the automatic lending of a portfolio of securities as demand from borrowers is created. The asset owner can define what securities can be lent and can also set limits on the maximum value. The ICSD client has a contractual relationship with the ICSD. The ICSD assumes all exposure risk, and all loans are fully collateralised to cover the market value of the loaned securities. The names of the borrowers are not disclosed. All clients' securities to be lent are aggregated into an anonymous, single lending pool from which securities are loaned.

Securities can be provided by borrowers to lenders to protect the lenders against default over the loan. Securities provided as collateral are usually revalued every day. This process is termed 'mark-to-market', with borrowers required to maintain collateral with a market value at least equal to the market value of the loaned securities, plus some agreed margin 'haircut'. A haircut is the extra collateral that a borrower provides in order to mitigate any adverse movements in the value of the loan before the next revaluation. A general rule is: the greater quality of the collateral, the less haircut is applied.

Where shares are borrowed to cover a short sale, cash is generated from settling the sold transaction. That cash can then become collateral that is passed to the lender to protect them from market risk while the stock is out on loan. It is usual for the borrower to provide a small excess of, say, 5% to further protect the lender. Any cash held as collateral is generally placed on deposit in order to earn interest (where rates permit) which fully or partly contributes to the fees incurred by the borrower.

The provision of collateral at the outset is known as **initial margin**. The value of the loaned stock is also revalued daily and, where necessary, margin can be returned to the borrower (if the security value decreases), or the lender may call for additional margin (if the value has risen). This 'topping up' of margin is known as **variation margin**.

The borrower may decide to pledge more than an adequate amount of collateral, well in excess of what is required, in order to avoid the daily variation margin call process, which can be administratively laborious.

Most stock loan transactions are on an overnight basis. In some circumstances, lenders might be prepared to guarantee that they will lend the assets for a longer period. In these instances, it means that

the borrower can have the certainty that they can have use of the borrowed securities for the agreed period without being subject to a recall whereby the lender may require instant repayment of the loaned security (eg, if the lender has sold the stock). However, even when a loan is recalled, a borrower would normally have more than one supplier of securities to borrow, and so it can usually borrow from another to repay the loan to the initial lender.

4.5.2 Dividends and Tax

Another aspect to consider for both the lender and the borrower is what happens when a company pays a dividend in respect of the shares out on loan. If there is an open loan when a stock is marked 'ex-dividend', the lender (although still contractually entitled to the payment) will not receive it directly from the company as the securities have been temporarily passed to the borrower.

This means that the borrower of the shares might receive the dividend or, if the securities have been used to cover sales, then neither the borrower nor the lender may receive it. Because the lender is still considered to be the 'beneficial owner' of the securities (as opposed to being the 'legal owner'), the lender will expect a compensatory payment from the borrower. This is referred to as a 'manufactured dividend'. The size of the manufactured dividend required to be paid to the lender should compensate the lender for the post-tax (net) dividend payment that it would have received had it not lent the security. In some cases, the lender would require the gross (pre-tax) dividend; in other cases, the net dividend would be passed, but there still may be a requirement to account for the tax element (depending on the country of securities, lender and borrower).

The tax position in relation to stock lending can be quite complex and varies greatly from country to country. Some countries have retrospective agreements in place to help reduce the tax burden, or double taxation, called double taxation agreements (DTAs) – for example, the UK and China, the US and Malta, and India and Japan. Those involved in stock lending should always obtain professional advice on any tax implications or matters.

4.5.3 Legal Ownership Aspects

Lenders and Borrowers

When a lender transfers equities on loan to a borrower, they no longer legally own them. This also means there is no entitlement to vote. As beneficial owner, the lender is still exposed to price movements on the lent shares since the borrower will return them at a later date. If the lender wants to exercise their right to vote, they will need to recall the stock in good time so that a proxy voting form can be completed and returned to the registrar by the stated deadline.

In the securities lending agreement between the borrower and lender, for any corporate activity with a benefit or an option, the details and methodology of how any entitlements issued by a corporate action will flow back to the lender should be stated.

Securities Lending Risk

Securities lending is a regulated activity in most major securities markets. Counterparties who transact with each other would generally be subject to a legal agreement – for example, a global master securities lending agreement (GMSLA). The GMSLA details the obligations of both the lender and borrower.

In assessing the credit worthiness of a borrower, the lender will establish its own view as to the level of credit risk a counterparty poses, often by using the services of a credit rating agency (see section 9.3 of this chapter). Once this has been established, the lender will set limits on the amount of acceptable exposure it is willing to have with such borrowers.

The lender will also keep these limits under regular review and determine what type of collateral is acceptable. When taking collateral against loaned securities, risk should be limited to market risk, whether it is intra-day or overnight.

To avoid any daylight exposure risk, stock loans and stock loan returns against cash are usually transacted on a delivery versus payment basis (DvP), also called delivery against payment (DAP), delivery against cash (DAC) and cash on delivery. This system ensures that delivery occurs only if payment does.

Where DvP is not possible, it would be usual practice for the lender to require collateral before lending the securities to the borrower. A further risk is known as collateral risk, where the lender is relying on the adequacy of the collateral, as well as the credit worthiness of the counterparty. The excess margin collected must be enough to cover usual fluctuations in the security or markets. The variation margin process normally mitigates the risk following the **marking to market** of the collateral being held.

5. Investment Styles

5.1 Long, Short and Leveraged, Issuer and Sector-Specific, High Conviction and Patient Capital

Learning Objective

1.5.3 Be able to assess the main aims and investment characteristics of the following cash, bond and equity portfolio management strategies and styles: long, short and leveraged; issuer and sector-specific; high conviction and patient capital

5.1.1 Sector Specific

There are numerous investment research firms, which provide specialised information on specific sectors of the market, as well as an overview of sector performance in general. Examples are publication of research for individual equities or sectors, changes in credit ratings for individual companies and key economic data for the direction of the market as a whole. It is important to appreciate that credit ratings are tailored to particular sectors. Ratings should be comparable across different sectors, but a rating may serve a very specific purpose in, say, the banking or insurance sectors; for example, the likelihood

of a bank running into serious financial difficulty requiring support, and whether it will get external support in such an event. This obviously has no equivalent outside the financial sector.

5.1.2 Investment Strategy

The Investment Association (IA) has published a classification system for the investment strategies adopted by the major open-ended collective investment vehicles.

The groups correspond to broadly different investment objectives.

- Funds principally targeting capital protection.
- Funds principally targeting income.
- Funds principally targeting capital growth.
- Funds principally targeting an outcome.

The general principle for qualification within a given sector is that the fund holds at least 80% of its assets in that sector.

Also based in the UK, the Association of Investment Companies (AIC) represents a broad range of investment trusts, venture capital trusts (VCTs) and other closed-ended funds. These companies are classified into a sector, usually based on their regional/country focus (eg, the US, China/Greater China), industry focus (eg, Biotechnology & Healthcare) or investment objective (eg, UK Equity Income).

Asset Allocation

Asset allocation involves considering the big picture first by assessing the prospects for each of the main asset classes within each of the world's major investment regions against the backdrop of the world economic, political and social environment.

Asset allocation can be divided into two categories:

- strategic asset allocation (SAA), which refers to fixed target allocations of asset classes, and is more focused on long-term returns, and
- tactical asset allocation (TAA), which refers to short-term adjustments that might generate a higher rate as market conditions change.

Once asset allocation has been decided, the next step is to consider the prospects for those sectors within their favoured bond and equity markets. Sector selection decisions in equity markets are usually made with reference to the weighting each sector assumes within the index against which the performance in that market is to be assessed. For bonds, sector selection focuses on factors such as duration, yield curve positioning and credit quality, assessing the relative attractiveness of government, corporate and emerging market debt. Sector selection in other asset classes (such as property, commodities, or alternatives) focuses on the economic cycle, inflation sensitivity and diversification benefits, among other factors that are tailored to the unique characteristics and risk-return profiles of that asset class.

The final stage of the process is deciding upon which securities should be selected within the favoured sectors. A combination of fundamental and technical analysis will typically be used in arriving at that decision.

The investment strategy adopted will need to determine whether this asset allocation is achieved using passive or active investment management.

Sector Selection

A 'top-down' approach to portfolio management (as discussed in section 2.3 of this chapter) involves making major asset-allocation decisions first, selecting asset classes which align with the objectives and constraints of the fund as stated in the mandate or prospectus. Individual securities are then selected to fit within this structured approach.

Where a top-down approach is adopted, investment management involves the following three activities in the sequence below:

- asset allocation
- **market timing** or tactical asset allocation
- stock selection.

Given the strong interrelationship between economics and investment, the sector selection process is also heavily influenced by economic factors, notably where the economy is currently positioned in the economic cycle. See section 8.5 for more information.

5.1.3 Issuer Selection

A bottom-up approach to asset allocation focuses on the unique attractions of individual securities and the characteristics of the issuer. In the case of an equity investment, the price/earnings (P/E) multiple for the issuer, the P/E multiples for competitors, the rate of earnings-growth, and other financial ratios relating to profitability and gearing are important considerations. Note that the P/E ratio may not be suitable for all sectors; for example, in industries with significant capital expenditure (eg, utilities or telecommunications), the price/book (P/B) or price/cash flow (P/CF) ratios might provide a more accurate reflection of value, as earnings may be heavily influenced by non-cash items such as depreciation.

In the case of considering a bond purchase, the investor will want to examine the credit ratings reported by the major credit rating agencies, the spreads between the issuer's bonds, and other benchmarks such as government issues of similar maturity. (See section 9.3 on credit ratings).

In addition, there are opportunistic factors to consider in evaluating the attractiveness of an individual issuer of securities. Although the health and prospects for the world economy and markets, in general, are taken into account, these factors are secondary to others, such as whether a particular company is a possible takeover target or is about to launch an innovative product.

5.1.4 Long, and Short Positions, and Leverage

Investors use long and short positions to achieve different results, sometimes in tandem, and sometimes using leverage to boost potential profit. An investor may wish to hedge their long share position by simultaneously buying a put option.

These positions mean the investor can:

- benefit from a price rise in the shares
- be able to sell the position at a guaranteed price if things go wrong and the price falls.

There is a very wide choice of long and short positions that investors and traders can create. Those with more expertise will understand the many opportunities, advantages and disadvantages of the myriad strategies, but they require specialist knowledge. It is often said that these strategies are not for the faint hearted.

5.1.5 Patient Capital and High Conviction

Patient capital is covered in section 3.1 of this chapter. To recap, patient capital usually refers to longer-term investments, where there is an acceptance that returns will not be expected for a long period of time (often between three and 15 years). During this period, investment managers may face short-term losses, as the strategy focuses on achieving sustainable, long-term outcomes rather than quick financial returns.

Typical examples of patient capital are sovereign wealth funds and pension funds, although more recently, it has also become a key element of impact investing, where the emphasis shifts from short-term profits to supporting environmental, social and governance (ESG) goals and greener investments. An example would be an investment in an early-stage enterprise that provides low-income communities access to healthcare, housing, water, alternative energy and agricultural support. There would be no expectation of immediate returns; but it could lead to significant return on capital, along with positive environmental/social outcomes over time.

Patent capital often involves smaller investments in a wide variety of sectors such as healthcare, leisure, hospitality and education. These can present exciting opportunities for investors, while also creating local jobs in the community and fostering sustainability. Registered investment funds (RIFs, which are pooled investment vehicles regulated by financial authorities) and private real estate investment trusts (private REITs, which invest in income-producing real estate but are not publicly traded) are also commonly used vehicles for patient capital strategies, particularly for investors seeking access to long-term, illiquid assets such as property and infrastructure.

Another vehicle supporting patient capital is the long-term asset fund (LTAFs), which provides a platform for long-term investments in illiquid assets – see section 3.1.1. Due to its focus on sectors such as infrastructure, property and private equity, LTAFs offer institutional investors the opportunity to diversify their portfolios with assets that align with a longer-term horizon. The structure of LTAFs enables investors to accept the illiquidity associated with these assets, while providing a chance to support projects that have meaningful, long-term social and environmental impact.

The opposite of diversification is high conviction. This describes an investment style where, for example, a fund would invest in a small number of which are considered high-quality investments that are known to have a strong competitive position for the future and are selected as expected high-performance companies for the next several years.

High-conviction strategies can be advantageous in the following ways:

- Holding fewer assets can result in a superior insight into underlying companies.
- Longer holding periods can allow time for a company's anticipated profitability (and returns) to be reflected in the share price.
- Investment managers can build portfolios around their most researched and best-understood investment ideas.

5.2 Ethical, Sustainable and Responsible Investment

Learning Objective

1.5.5 Be able to assess the main aims and investment characteristics of the following cash, bond and equity portfolio management strategies and styles: ethical, responsible, sustainable investment

As participants in financial capital markets, individuals and organisations are free to select investments on any basis they wish (subject to fiduciary responsibility in some instances, eg, trustees to a trust's beneficiaries). While conventional market practice dictates that investors should operate solely to maximise their returns, ethical, sustainable and responsible investors believe that moral considerations should also apply, or that short-termism is supporting damaging corporate activities.

Broadly, ethical, sustainable and responsible investors select companies that do not contribute to, or actively help tackle, social and/or environmental issues while avoiding those that engage in unsustainable or significantly harmful behaviours. Such investors may also use the influence of financial markets to reward the former and reduce capital available to the latter.

This form of investing is not a new concept. Ethical investing originated from religious movements promoting avoidance of involvement in certain 'sinful' business activities. Investors of various faiths, including Islam, Judaism and Christianity, traditionally avoided investing in organisations associated with producing alcohol, tobacco and arms, as these businesses conflicted with their religious beliefs.

The political climate of the 1950s and 1960s saw developments in socially responsible investing (SRI) including equality for women, civil rights and labour rights. Concerns at that time also related to the Vietnam War, and public demand for ethical vehicles began to rise. In the 1970s, ethical funds started to gain traction (initially in the US, then internationally) as investors sought to align their investments with their values. This movement laid the groundwork for the development of similar funds worldwide.

Environmental awareness came to the forefront in the 1980s, following disasters such as Chernobyl and the Exxon Valdez oil spill. This resulted in investors becoming increasingly focused on a broader range of environmental issues.

The COVID-19 pandemic has heightened environmental and social awareness, driving increased demand for investments addressing these issues. For example, while the pandemic temporarily reduced carbon emissions due to fewer people travelling and decreased industrial activity, these positive effects were short-lived, with greenhouse gas concentrations reaching record highs by September 2020 as economies reopened. On the social front, many individuals (facing job insecurity during the pandemic) turned to zero-hours contracts and the gig economy, raising concerns over employment rights.

The ongoing cost-of-living crisis (driven by high inflation and rising interest rates) has further exacerbated financial pressures on individuals, making it harder for many to secure stable employment and fair working conditions. For businesses, rising operational costs and supply chain disruptions have created challenges, while also influencing their ability to offer competitive wages and maintain employee satisfaction.

Consequently, the concept of investing in line with ethical, sustainable and responsible principles has gained traction on a global scale. For example, in its latest biennial Investment Review (which provides a snapshot of investment in the responsible and sustainable investment markets), the Global Sustainable Investment Alliance (GSIA)[1] reported that assets reached $30.3 trillion worldwide in 2022, a 123% increase from the $13.6 trillion reported in 2012[2]. While this is below the $35 trillion reported in 2020, it is important to note that the US has recently adopted a revised methodology, which has likely contributed to the lower figure. Despite these fluctuations, ethical, sustainable and responsible investing remains a priority for many investors who seek to align their portfolios with their values and address pressing global challenges.

While many companies have used this growing demand as an opportunity to improve their environmental and social performance, others have been accused of attempting to capitalise on this demand by simply rebranding themselves. Investors therefore need to take care – for example, by conducting thorough due diligence and applying screening processes – to identify genuine sustainable practices versus mere 'washing'.

Notably, recent policy shifts in the UK and UK reflect a broader rollback on climate commitments, diversity, equity and inclusion (DEI), and environmental, social and governance (ESG) priorities, particularly following political changes such as Donald Trump's return to the White House. This is raising questions about the future trajectory of sustainability-focused investing.

5.2.1 Screening Processes

Having identified the types of concerns motivating ethical, responsible and sustainable investing, investors want their money to be put to good use. This means not merely maximising returns, but also benefiting society (or, at least, not doing significant harm) – a sentiment known as *'doing well while doing good'*.

To achieve these goals, investors broadly wish to allocate resources to areas they feel deserve investment and to support companies that benefit the community, or those with products, services

1 Global Sustainable Investment Alliance (GSIA), 2022. Global Sustainable Investment Review. Retrieved from http://www.gsi-alliance.org (Accessed: December 2024)

2 Global Sustainable Investment Alliance, 2012. Global Sustainable Investment Review. Retrieved from https://www.gsi-alliance.org/wp-content/uploads/2023/11/2012-Global-Sustainable-Investment-Review.pdf (Accessed: December 2024)

and/or business practices that contribute to sustainable development, while also trying to avoid those with poor profiles.

Depending on their values, various filters or screens may be applied. There are two common approaches to screening:

- **Negative screening** deliberately excludes companies producing 'undesirable' products. Examples include alcohol, tobacco, gambling, adult entertainment and weapons manufacture (known collectively as the 'sin stocks'), although the list has extended over the years to include deforestation, the fur trade, and the charging of excessive interest rates (typically associated with payday loans), among others.
  One challenge is determining whether a company should be excluded if part (but not all) of its operations is involved in a particular activity. To address this, de minimis levels (ie, the level of exposure to the excluded activity deemed acceptable) may be applied to the firm's turnover or revenue: the lower the level, the stronger the exclusion.

- **Positive screening** grew out of negative screening. It seeks to support firms providing positive solutions to challenges such as climate change and social justice. While this would exclude companies involved in activities deemed to be unacceptable, there is room for investment in what some investors may consider to be 'less-than-perfect' businesses (eg, a clothing company that sells fur), as long as they are making efforts to improve their practices (eg, preserving the environment).

Ethical, responsible and sustainable investing can involve one or both of these screening processes – eg, negative screening to exclude particular companies or sectors with low scores on specific criteria, and/or positive screening to select companies that have already established high scores.

5.2.2 Investment Approaches

The terms 'ethical investing', 'ESG', 'sustainable and responsible investing' and 'impact investing', to name a few, are sometimes used interchangeably by financial professionals and investors alike. In practice, each are strategies in their own right, and there are distinct differences between them. For example:

- **ESG** – this involves three key dimensions of responsible and sustainable investing: environmental (eg, concerns about greenhouse gas emissions and pollution), social justice (eg, human rights and working conditions) and corporate governance (eg, board structures and practices).
- **Socially responsible investing (SRI)** – while ESG and SRI both seek to manage a variety of environmental and societal risks, ESG aims to identify companies with higher investment potential while SRI investment is typically driven first by investors' individual values. Today, one of the most important issues for SRI (among other forms of responsible, sustainable and ethical investment) is shareholder engagement, whereby shareholders (as partial owners of a business) may enter into dialogue with management to encourage behavioural change and address serious social issues, as an alternative to the formal vote on a shareholder resolution.
- **Impact investing** – this moves beyond positive screening by emphasising the need for the companies to have active beneficial impact, with explicit measurable impact goals. For example, reducing their carbon footprint, and economic inclusion (ie, ensuring that everyone has equal opportunity to participate in the economic life of their community).

- **'Responsible and sustainable investing'** is an umbrella term representing ESG, SRI and impact investing.
- **Ethical investing** – this is the practice of selecting investments based on ethical or moral principles. It involves filtering out the sin stocks. At the same time, it may include supporting ethical companies, who make a positive contribution through their products and services.

5.2.3 Suitability of Ethical, Responsible and Sustainable Investing

Historically, responsible and sustainable investing emphasised 'progressive', smaller growth companies, and therefore funds/portfolios tended to focus on generating capital growth over anything else. Due to their more aggressive nature, such funds/portfolios were more suitable for investors who could tolerate more risk. They had a greater capacity for loss absorption in the event that the underlying investments did not perform as expected.

However, as investors have become increasingly aware of responsible and sustainable business practices over the years, company management has come under increasing pressure from shareholders and prospective investors to manage better risks associated with responsibility and sustainability factors. This, combined with the development of screening techniques, means that more companies (and across the market cap spectrum) satisfy responsibility and sustainability criteria.

The resultant widening of the investment universe enables fund/portfolio managers to construct more diversified funds/portfolios relative to history, but also allows for a broader range of objectives such as preserving/growing capital, generating an income, or a combination of the two. Consequently, this enables them to meet the needs of a broader range of investors with different objectives, risk profiles, and ethical/responsible/sustainable/moral principles.

That said, the difficulties of defining ethical, responsible and sustainable investing are both theoretical and practical. What stance should be adopted? Should the criteria encompass positive and/or negative screening processes? Regarding funds, investors can be confident that an ethical, responsible and sustainable fund is aligned with their personal values and moral principles by reading the prospectus and fact sheets.

The risks specific to ethical, responsible and sustainable investment funds are the same as conventional funds, including:

- **Default risk** – the company may be unable to pay its debt.
- **Liquidity risk** – the company may be unable to meet its short-term debt obligations.
- **Inflation risk** – the inflation rate will erode the investment's purchasing power by more than the increase in value of the investment.
- **Interest rate risk** – an increase in interest rates typically leads to businesses and consumers cutting back on spending, a fall in corporate earnings and therefore share prices.
- **Foreign currency risk** – the risk of the effects of **exchange rate** variances on investors' returns.
- **Concentration risk** – by removing unsustainable components, portfolios can be heavily concentrated in a particular asset class or sector. One approach to mitigating this risk is by increasing diversification across other sectors; however, this may come at the expense of the portfolio's overall integrity from an ethical, responsible and sustainable perspective, as it could lead to exposure to sectors or companies that are not fully aligned with the desired criteria. This trade-off requires careful consideration to ensure that the portfolio remains consistent with its ethical, responsible and sustainable objectives.

6. Central Banks and Macro-Economic Policy

Learning Objective

1.6.1 Assess the macroeconomic tools and mechanisms that central banks and supranational organisations use and how they have been applied during recent economic cycles: quantitative easing; control of the yield curve; evolution of the principle of lenders of last resort; rate controls; other mechanisms

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We will now consider how economic considerations and policy come together in practice, by looking at the role of central banks and the macro-economic tools available to them.

6.1 The Role of Central Banks

Central banks operate at the very centre of a nation's financial system. Most are public bodies, though increasingly central banks operate independently of government control or political interference.

The following are some of the core responsibilities of central banks, but it is undoubtedly their roles in the management of the economy and as lender of last resort to the banking system that have been most closely observed and discussed during the recent economic cycle.

- Acting as banker to the banking system by accepting deposits from and lending to commercial banks.
- Acting as banker to the government.
- Managing the **national debt**.
- Regulating the domestic banking system.
- Acting as lender of last resort to the banking system in financial crises to prevent its systematic collapse.
- Setting the official short-term rate of interest.
- Controlling the money supply.
- Issuing notes and coins.
- Holding the nation's gold and foreign currency reserves to defend and influence the value of a nation's currency through intervention in the currency markets.
- Providing a depositors' protection scheme for bank deposits.

Before looking at the range of macroeconomic tools available to central banks and how these have been applied in recent years, we will first consider their roles and responsibilities.

6.1.1 Bank of England (BoE or the Bank)

The UK's central bank was founded in 1694, nationalised in 1946, and gained operational independence in setting UK monetary policy in 1997.

Sometimes known as the Old Lady of Threadneedle Street, the bank's roles and functions have changed over time, but today it has two core purposes:

- **Monetary stability** means stable prices and confidence in the currency. Stable prices involve meeting the UK government's inflation target which is a two-year rolling target of 2% for the **consumer prices index (CPI)**. This it does by setting the base rate, the UK's administratively set short-term interest rate.
- **Financial stability** refers to detecting and reducing threats to the financial system as a whole. A sound and stable financial system is important in its own right, and vital to the efficient conduct of monetary policy.

To promote the safety and soundness of individual financial firms, the **Prudential Regulation Authority (PRA)** of the Bank regulates and supervises roughly 1,500 banks, building societies, credit unions, insurers and major investment firms.

The Monetary Policy Committee (MPC) of the BoE is responsible for setting interest rates to meet the government's inflation target. The MPC comprises nine members – the governor, the two deputy governors, the BoE's chief economist, the executive director for markets and four external members appointed directly by the Chancellor. Members do not represent individual groups or areas; they are independent. Each member has a vote to set interest rates at the level they believe is consistent with meeting the inflation target (one person, one vote).

6.1.2 The European Central Bank (ECB)

The ECB is based in Frankfurt, Germany. It assumed its central banking responsibilities upon creating the euro, in 1999. The euro has since been adopted by 20 of the European Union's (EU) 27 member states, collectively creating an economic region known as the eurozone.

The ECB is principally responsible for setting monetary policy for the entire eurozone, with the sole objective of maintaining internal price stability. Its objective of keeping inflation, as defined by the harmonised index of consumer prices (HICP), close to but below 2% in the medium term is achieved by referring to factors that may influence inflation, such as the external value of the euro and growth in the money supply.

The ECB sets its monetary policy through its president and council, the latter comprising the governors of each of the Eurozone's national central banks.

6.1.3 The Federal Reserve (The Fed)

Established in 1913, the Federal Reserve system comprises 12 regional banks that oversee and provide liquidity to local banks. The Fed is governed by a seven-member board appointed by the US president.

In addition, the Federal Open Market Committee (FOMC) – which is part of the Fed – includes the board and the presidents of six Federal Reserve banks. The FOMC chairman, also appointed by the US president, is responsible for the committee's decisions, which are aimed at promoting price stability and full employment. The FOMC meets every six weeks to examine the latest economic data and the many economic and financial indicators it monitors to gauge the economy's health and determine whether the economically sensitive Fed Funds rate should be altered in response to its findings. Very occasionally it meets in emergency sessions, as and when circumstances dictate.

As lender of last resort to the US banking system, the Fed has intervened in times of market stress, providing support to US financial institutions and markets to prevent collapse and contain systemic risk, often through careful adjustments to the Fed funds rate.

6.1.4 The Bank of Japan (BoJ)

Japan's central bank has a statutory duty to maintain price stability. It is also responsible for the country's monetary policy, issuing and managing the external value of the Japanese yen, and acting as lender of last resort to the Japanese banking system.

6.1.5 The People's Bank of China (PBOC, PBoC or PBC)

The People's Bank of China is the Chinese central bank. It is responsible for designing and implementing monetary policy, ensuring financial stability, and managing China's significant foreign reserves and gold reserves.

It has a monetary policy objective to maintain the stability of the currency's value and thereby promote economic growth. Policy is determined by a monetary policy committee.

6.2 Macroeconomic Tools at Central Banks' Disposal

Central banks have various macroeconomic tools at their disposal to manage economic stability and prevent severe downturns. These tools are used in times of financial distress to support the economy, stabilise financial systems and ensure liquidity. Measures typically include adjusting interest rates, expanding central bank balance sheets, and implementing fiscal stimulus. We will consider the specifics of various policies in the sections below.

6.2.1 Financial Sector Intervention

During times of financial instability, vulnerability within the financial system often arises from imbalances that develop during the 'expansion' phase that has immediately preceded it. These issues can include:

- expansion of statements of financial position (also known as balance sheets) outpacing growth in the real economy
- exposure to assets with uncertain value, credit quality and liquidity
- over-reliance on wholesale funding
- low capital levels relative to underlying risks.

Rising defaults on high-risk loans can trigger vulnerabilities within the financial system, causing losses to spread across global markets due to their interconnectedness. This, in turn, can amplify the impact of such defaults, affecting a wider range of sectors and reversing previous trends of rising asset prices. Investor confidence in risky assets may then decline, and strains in the interbank market place financial institutions under significant pressure. Some institutions may fail, leading central banks and national authorities to intervene with exceptional measures in an attempt to stabilise the banking system.

The measures taken to restore stability can include:

- guarantees of bank assets and liabilities aimed at averting potential bank runs
- direct lending from central banks to allow rollover and prevent default
- capital injections to ward off insolvency
- nationalisations to allow failed institutions to continue to serve their customers
- removal of low-quality loans from bank balance sheets
- supporting the prices of assets where liquid markets had disappeared
- public certification by banking supervisors of the capital adequacy of large banks.

Government intervention can help to stabilise the situation, allow time for money markets to normalise and for banks to recapitalise their balance sheets.

6.2.2 Lender of Last Resort (LOLR)

A lender of last resort (LOLR) exists within a financial system (usually the government/central bank) and steps in to aid a financial institution that cannot obtain sufficient funds to meet its obligations. From the start of the 20th century, most countries' central banks have assumed the role of LOLR, including ensuring there is enough liquidity in the financial system.

Having a lender of last resort is often criticised because, according to critics, it encourages banks to take unnecessary risks, putting customers' funds at risk. Others argue that the potential fallout from not having one is far greater, as it can lead to widespread instability in the financial system.

6.2.3 Controlling the Yield Curve

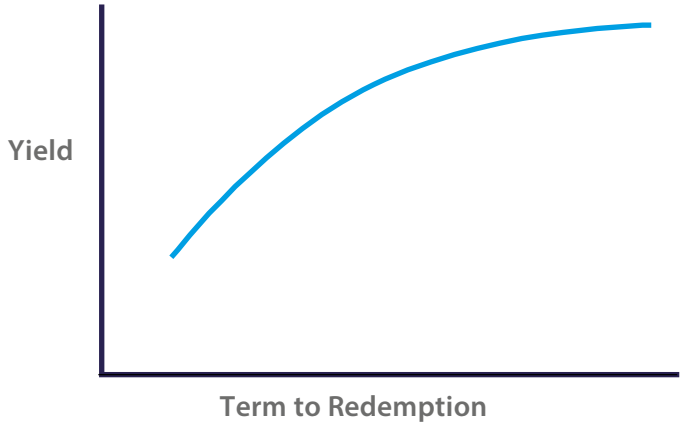
The yield curve is a line that plots yields (interest rates) of bonds with equal credit quality, but with different maturity dates – this is usually based on government bond yields.

The shape of this yield curve provides important information to bond market participants about interest rate expectations in the capital markets. Since this interpretation is beyond the scope of this book and syllabus, we shall not go into details of the financial theories developed to explain the yield curve or their rate term structures here. Hence, a simpler conceptual interpretation is provided at this stage of the learning process.

There are three common types of shapes of yield curves observed in practice: normal, flat and inverted.

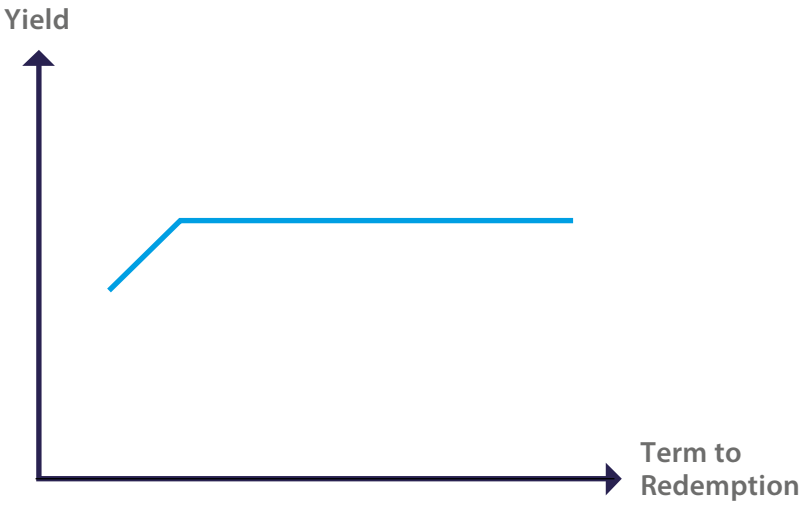
A normal yield curve has a positive (upward) slope, reflecting that securities with more time remaining to maturity have a slightly higher yield than shorter-dated securities. More broadly, an upward-sloping yield curve depicts the **time value** of money – investors will generally require a higher yield, or a premium over shorter-maturity bonds, for tying up their invested capital for longer. This observed term premium is due to greater uncertainty over longer future periods.

Normal Yield Curve (eg, the 1990s)



At other times, the yield curve may start to look much flatter, reflecting a relatively stable outlook for the economy. Alternatively, this flattening-off can reflect expectations of a gradual future decline in interest rates. A curve-flattening development is normally observed during an economic downturn phase in the cycle, also accompanied by moderating inflationary pressures. When short- and long-term bonds are offering the same yields, investors may choose the bond with the least amount of risk (however, an investor's wish to have the certainty of holding bonds until maturity to meet a long-term obligation may put a high priority on choosing bonds with maturities matching dates when the investor wishes to realise funds).

Flat Yield Curve (eg, the 2000s)



The yield curve may also sometimes be **inverted**, with yields on longer-dated securities being lower than on shorter-dated securities. An inverted yield curve may reflect:

- expectations that interest rates will fall in the future
- expectations that inflationary pressures in the economy will reduce dramatically in the future

- lower supply and higher demand for gilts in the market; for example, a decrease in the issuance of gilts by the DMO and/or increased demand from investors for long-dated gilts will cause the longer-dated gilt prices to rise and their yields to fall.

There is also a humped yield curve observed sometimes, which has a combination of these shapes.

Central banks can influence the yield curve and, in turn, interest rates – for example, by setting a specified level of long-term interest rates, and/or by buying or selling as many bonds as necessary to hit that target. Thus, the yield curve is not static but dynamic, and is continually changing shape over time as new information about future rates arrives and is priced into the market.

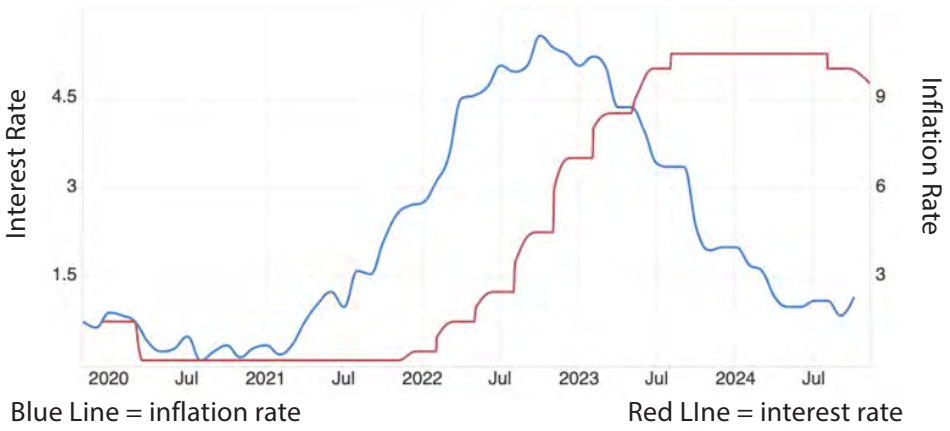
Central banks also use interest rates to control inflation. They set an interest rate at which they will lend to financial institutions, which influences the rates available to savers and borrowers. The result is that movements in base rate affect spending by companies and their customers and, over time, the rate of inflation – this is the change in price for a static market basket of goods and services from one period to the next.

Changes in base rate can take up to two years to fully impact, so the central bank has to look ahead when deciding on the appropriate monetary policy. If inflation is set to rise above target, the central bank raises rates in order to slow spending and reduce inflation. Similarly, if inflation is set to fall below its target level, it reduces bank rates to boost spending and inflation. In reality, because markets and economies are dynamic and can often pre-empt rate actions, then the central bank has to continually adapt to overshooting and undershooting targets.

The impact of using interest rates in this way can be seen by looking at how central banks responded during the cost-of-living crisis. Many central banks worldwide increased interest rates to multi-decade highs in an attempt to manage high and rising inflation, driven higher by rising energy and food prices as well as supply chain disruptions, and therefore bring prices under control.

Taking the UK as an example, inflation peaked in percentage terms to 11.1% in October 2022, prompting the BoE raising base rates multiple times – from an all-time low of 0.1% in November to 5.25% in August 2023. This was the fastest increase of base rate adjustments in the BoE's history. This increase was reflected in higher borrowing costs including mortgage rates, which increased the financial strain on households, particularly those with variable-rate mortgages. As a result, disposable income fell, dampening consumer spending and exacerbating the cost-of-living crisis.

UK Inflation Rate vs UK Interest Rate (December 2020 to December 2024)



Source: Trading Economics[3]

Regardless, inflation remained high, with food and energy costs (the necessities of living) continuing to place pressure on household budgets. However, the rate hikes also slowed economic activity and reduced the demand for credit, which led to a cooling in housing prices and borrowing.

The rapid adjustments to interest rates in response to the cost-of-living crisis may have unintended consequences for long-term growth, leading to challenges such as increased borrowing costs for households and businesses, along with potential market distortions.

6.2.4 Quantitative Easing (QE) and Quantitative Tightening (QT)

Quantitative easing (QE) is a rather unorthodox method of boosting the money supply which, in the early part of the 21st century, was first adopted by the Bank of Japan (BoJ), then more widely during the aftermath of the global financial crisis by the UK, the US and the eurozone. A central bank's aim is to get money flowing around the economy when the normal process of cutting interest rates is not working, particularly when interest rates are so low that it is impossible to cut them any further.

In such a situation, it may still be possible to increase the quantity of money – the way to do this is for the central bank to buy assets in exchange for money. In theory, any assets can be bought from anybody. In practice, the focus of QE is on buying securities (like government debt, mortgage-backed securities or even equities) from banks.

The obvious question, therefore, might be: where does the central bank get the money to buy all these securities? The answer, to put it rather bluntly, is that it just creates it. There is not even a requirement for it to turn on the printing presses and increase the monetary base of notes in circulation. The central bank can just increase the size of the commercial banks' accounts at the central bank. These accounts held by ordinary banks at the central bank go by the name of reserves. All banks must hold some reserves at the central bank but, when there is QE, they build up excess reserves.

3 Trading Economics, 2024. United Kingdom Inflation Rate. Retrieved from https://tradingeconomics.com/united-kingdom/inflation-cpi (Accessed: December 2024)

If banks swap their long-dated securities for reserves, which are effectively maturing instantly, then the size of their own statement of financial position (also called a balance sheet) shrinks just as the central bank's balance sheet expands. The supposition is that the commercial banks, with reduced pressure on their own statement of financial position, will be able to lend more to their customers, which in turn will increase the liquidity available in the economy, and thus promote higher aggregate demand.

Nevertheless, QE is not considered to be a conventional form of monetary policy. Practically, the central bank creates new money to buy financial assets such as government bonds or shares. This process aims to directly increase private sector spending in the economy and return inflation to target (eg, 2% in the UK). In reality, however, this resulted in an increase in both bond and stock prices, but did not result in the expected increase in spending.

Quantitative tightening (QT), or quantitative hardening, is the opposite of QE; in other words, the central bank is selling its statement of financial position assets, thus reducing the money supply floating around in the economy. QT is, therefore, a form of contractionary monetary policy, applied by central banks to decrease the amount of liquidity within an economy.

Tapering

Tapering refers to the gradual reduction of asset purchases under a QE programme. Rather than abruptly ending QE, central banks phase out purchases to minimise disruption to financial markets and the broader economy. Tapering is typically announced in advance to provide transparency and manage expectations, as unexpected changes can lead to market volatility.

The transition from QE to tapering often signals that economic conditions are improving and that continued monetary stimulus is no longer required. However, the process can be challenging, as markets and investors may have become reliant on the liquidity provided by QE. For example, reduced asset purchases can lead to higher bond yields, tighter financial conditions and falling asset prices, which can dampen investor confidence and economic activity.

Thus, tapering serves as a bridge between QE and QT, helping central banks gradually shift from expansionary to contractionary monetary policy while mitigating the risk of shocks to the financial system.

Following the global financial crisis of 2007–08, an example of tapering occurred in 2013 when the US Federal Reserve announced its intention to scale back its QE programme. Until then, the Fed had been purchasing large quantities of government bonds and mortgage-backed securities (MBSs) to inject liquidity into the economy and support recovery. When then-Chairman Ben Bernanke signalled a reduction in asset purchases, markets reacted sharply, leading to what became known as the 'taper tantrum'. With investors fearing tighter financial conditions, this resulted in a spike in bond yields, declines in emerging market currencies and broader market volatility.

In response to the onset of the COVID-19 pandemic, however, the US Federal Reserve implemented several measures, including a renewed QE programme focused on purchasing US Treasury bonds and MBSs. From June 2020 to November 2021, the Fed had bought about $80 billion in Treasury bonds and

around $40 billion in MBSs each month. By 2022, these measures had expanded the Fed's balance sheet to $8.9 trillion, up from $4.3 trillion pre-pandemic.

Modern monetary theory (MMT) suggests that governments that issue their own currency can finance deficits by creating money, with inflation being the primary constraint rather than debt levels. Supporters of MMT argue that large-scale monetary expansion (eg, QE) is sustainable, as long as inflation remains under control. However, critics warn that excessive reliance on money creation can lead to inflationary pressures, eventually necessitating policy tightening through tapering and QT.

6.2.5 Fiscal Stimulus

In conjunction with these macroeconomic policies, governments can also use fiscal stimulus to counter the effects of recession.

When an economy enters a recession, governments typically expect a fall in tax revenues, which requires careful balancing of spending plans against falling receipts. While monetary policy is usually the preferred tool to combat economic downturns, in severe cases, **fiscal policy** may be necessary. Globally, governments have spent trillions of dollars to bolster their economies during times of economic distress, and have run up significant public deficits in the process.

Fiscal stimulus packages need to be evaluated carefully and judged against factors such as the:

- extent to which room for budgetary manoeuvre exists within a country's finances
- timeliness and effectiveness of any discretionary action
- period it will operate for.

For example, infrastructure investment will boost both supply and demand, providing that the investments are well chosen, but typically takes a long time to be brought on-stream and is challenging to wind down in line with a recovery in activity. Alternatives, such as tax cuts or transfer payments aimed at credit-constrained poorer households, may prove more effective in boosting demand.

Stimulus packages involve governments borrowing money against future revenues. This means that once there are clear signs of a recovery taking hold, it is necessary to begin to unwind the macroeconomic stimulus promptly to prevent inflationary pressures from gaining a foothold. At the same time, it is equally important that a credible fiscal framework is in place, to ensure that government debt can be reduced back to manageable levels.

High levels of public debt in the UK and other Organisation for Economic Co-operation Development (OECD) countries, combined with the spending pressures associated with **population** ageing, make this return to long-run public finance sustainability especially challenging.

6.3 Post-Recession and Macroeconomic Tools

Large cuts in base rates and QE have historically provided significant economic support, helping economies to recover and avoid severe downturns similar to past depressions, such as that seen in the 1930s.

However, macroeconomic support has its limitations:

- **Prolonged government intervention** of financial institutions can delay vital post-crisis reforms needed to strengthen and stabilise these entities.
- **Excessive fiscal stimulus** often leads to high and rising government debt levels, which can become unsustainable over time.
- **Keeping interest rates too low for too long** and maintaining excessive liquidity can distort markets and pose risks to long-term financial and monetary stability.

The key challenge for policymakers as economies recover is determining when and how to withdraw stimulus measures. This decision is further complicated by the fragile state of the financial sector and uncertain macroeconomic conditions, making premature tightening risky while delays could exacerbate vulnerabilities.

6.3.1 Post-Recession Reforms

Global economic policy following a recession often focuses on three key areas to strengthen resilience and mitigate future risks:

- **Reducing individual bank failures** – implementing measures to address the size, composition and risk profile of bank balance sheets. This includes requiring banks to hold sufficient capital and liquidity to better reflect their risk exposures.
- **Preventing system-wide failures** – mitigating the risk that the failure of one major institution triggers a cascade of failures across the financial system. Policies may involve improved oversight, stress testing and systemic safeguards.
- **Addressing procyclicality** – this refers to the relationship between the financial system and the real economy. During periods of economic growth, lending expands as banks are well-capitalised, borrowers appear more creditworthy and collateral values rise. Conversely, in downturns, banks face losses, capital constraints and reduced lending capacity, while borrower creditworthiness and collateral values decline. Addressing procyclicality may involve requiring banks to build capital buffers during economic booms; these reserves can then be drawn upon in downturns, in order to help stabilise lending and reduce the severity of economic contractions.

6.3.2 Fiscal Consolidation

The combination of large-scale fiscal stimulus, financial rescue packages and falling tax revenues during economic downturns has historically resulted in significant government budget deficits and rising public debt levels across many countries.

In the aftermath of severe economic shocks, public deficits often expand sharply as governments intervene to stabilise economies. Although private sector debt may decline during such periods, public debt increases as governments take on more fiscal responsibility, leading to concerns about sustainability of public finances.

Addressing high public debt and fiscal deficits remains a significant challenge for many economies today. Key factors include:

- **Slow economic recovery** – during economic downturns, tax revenues decline sharply, while government expenditure on welfare benefits rises to support those impacted. A slow and protracted recovery can prolong these deficits, as the gap between spending and revenue can be difficult to close.
- **Lower output and reduced tax revenue** – tax revenues often reflect economic activity. If sectors that previously contributed disproportionately to growth and tax receipts (eg, construction and financial services) fail to rebound quickly, then corporate profits, personal incomes and overall tax revenus remain subdued. At the same time unemployment rates (and therefore unemployment benefits) may remain elevated.
- **Structural deficits are slow to resolve** – budget deficits resulting from economic downturns are not easily unwound. Recovery depends on restoring economic growth and reducing unemployment to more sustainable levels, and these processes often take years.
- **Ageing populations and long-term fiscal pressure** – many governments face rising costs associated with ageing populations, including pensions and healthcare. While measures such as raising retirement ages and reforming pension systems can alleviate these pressures, their effects take time to materialise.

7. Long-Run Costs, and Economies and Diseconomies of Scale

Learning Objective

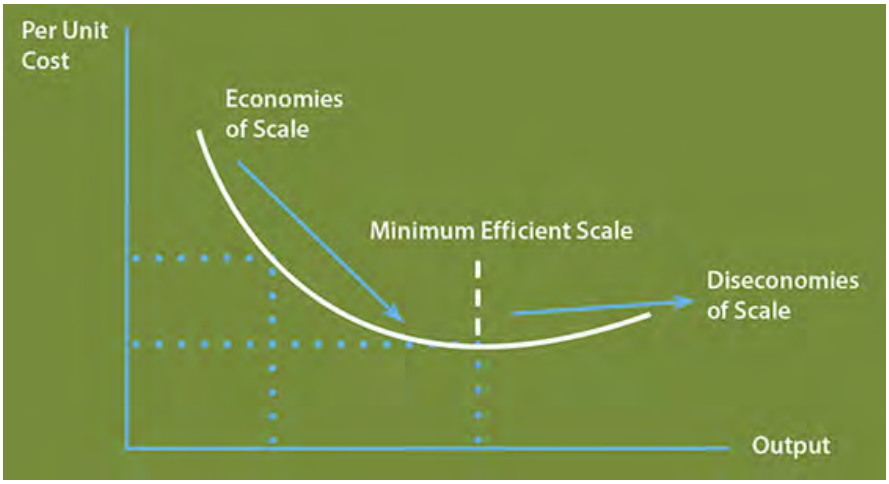
3.3.9 Know characteristics of: economies of scale; diseconomies of scale

Companies may be able to lower their costs and improve their margins, among other financial ratios (see chapter 3), by improving their economies of scale. In brief, economies of scale reduce a firm's unit costs as its productive capacity and output increase.

Firms maximise profit by producing at a level of output where their marginal costs (MC) are equal to their **marginal revenue (MR)**. That is, a firm will manufacture one additional unit of a product or service when the extra (or marginal) revenue generated by the sale of that unit equals the cost of producing it.

In economics, 'production costs' refers to the expenditures incurred by firms from manufacturing a product or providing a service. This includes labour, land, raw materials and consumable supplies, all needed in the production process. In the long run, all production costs must be covered when deciding to produce output; so long as revenue generated by sales covers all costs, then the firm will be making a normal profit. All factors of production, or inputs to the production process, are variable.

Over this longer time frame, the production process benefits from economies of scale as the firm's productive capacity increases. Production costs are minimised at a point known as the **minimum efficient scale (MES)**, as shown on the curve below; this curve shows the minimum average cost to produce different output, given the variability of the factors of production. Beyond the MES, diseconomies of scale set in as management bureaucracy negatively impacts the production process.



What differentiates the short run from the long run is the time necessary for adjustments to be made to every one of the factors of production used in the production process.

As you can see from the diagram, the long run is an amalgamation of a series of short runs, though without the capital constraints. From this, you should note:

- If **marginal cost** is lower than average cost, then the average cost must be falling since we are adding a lower number to total cost than the current average.
- When marginal cost becomes greater than average cost, the average cost must be rising.
- Each point on the LRATC curve will not necessarily correspond with the lowest point on each short run average total cost (SRATC) curve where the stock of capital equipment is fixed.

8. Economic Factors

Learning Objective

1.6.2 Be able to assess economic factors that influence market prices: economic statistics; leading and lagging indicators; inequality of information; market structure

8.1 Statistics

The ability to source and interpret all kinds of information, both qualitative and quantitative, in a timely fashion is key to the portfolio management process. However, since information and data can be sourced from a variety of media, presented in a wide range of formats and may not always be in a readily usable form, it is imperative for portfolio/fund managers to become familiar with reliable information sources and develop the skills to efficiently assimilate data. This enables informed investment decisions to be made and investment opportunities to be capitalised upon.

8.1.1 Research and Reports

- **Internet websites** – these range from those that provide up-to-the-minute general and finance news to those which provide access to comprehensive and more specialist economic, social, demographic and industry information.
- **Commercial quote vendors** that provide real time security pricing information, as well as historic security and economic data such as Bloomberg, Thomson Reuters, Financial Times and Wall Street Journal.
- **Company financial statements** – eg, annual reports, interim reports and investor presentations.
- **Share price charts** – independent company analysis provided by specialist research consultancies and credit rating agencies (see section 9.3).
- **Authoritative in-depth analysis** of financial, economic and social trends produced by international agencies (eg, the World Bank, the International Monetary Fund (IMF) and the Organisation for Economic Co-operation and Development (OECD)), business schools and other academic research organisations.
- **Government publications** – governments publish a wide range of information on economic indicators; hence, they are often the principal source of economic data on a country.
    - In the UK, two key data sources on the economy come from the Office for National Statistics (ONS) (eg, national income, productivity and inflation) and the BoE (eg, the Financial Stability Report, Inflation Report, and minutes of the MPC).
    - In the US, the monthly non-farm payrolls (NFPs) are closely analysed by markets worldwide, as it measures the number of workers (excluding farm workers and workers in a handful of other job classifications).
    - Investors and traders use the data to make forward forecasts about the prospects for GDP growth and inflation, and how this might affect the interest rate decisions by the relevant central bank.
- **Economic bulletins and financial reports** – eg, reports from government agencies, central banks and think tanks.
- **Newspapers and other journals**, provided they are reputable and credible sources. As well as Bloomberg, Thomson Reuters, Financial Times and Wall Street Journal, other examples include Nikkei Asia, The Economist and Forbes.
- **Broker research and distributor information** – brokers and major investment banks publish reports and specialised research on macroeconomic trends, as well as specific companies. Analysts provide insights to help investors assess the value, risk and volatility of securities. These reports may also specialise by industry or sector.
- **Desk research** – secondary source research and analysis by an investment fund management team.
- **Regulatory resources where relevant** – eg, communications from the FCA.
- **Social media** – social media has the power to influence financial markets. Worldwide, governments are increasingly using social media to communicate policy to the public; journalists and analysts to share their opinion of financial markets; and financial services firms to advertise products and services to consumers.
- **Professional interest forums**.

8.1.2 Fund Ratings

There is an array of investment funds available, themselves investing in a range of assets (eg, equities, bonds) and it is important to understand the types that are available.

Performance Ratings

There are several independent ratings agencies that provide performance ratings for investment funds. Most of these ratings are based on quantitative analysis – eg risk-adjusted absolute returns, comparing the performance of the fund with overall market performance, or assessing how the fund has performed against a given benchmark.

That said, some place considerable weight on qualitative factors. This is more subjective, and considers metrics such as the managers' skills and expertise, how the managers run their fund (eg, investment strategy and decision-making processes), and the relative position of the fund compared to the investor's view of the market's future direction.

Although none of these ratings agencies claims to have predictive power, they seek to provide a valuable tool to filter out those funds that consistently underperform their benchmarks over the long term. That said, underperforming funds should not always be seen with pessimism; it may be that the sector/country/region in which the fund invests – or perhaps the manager's investment style – has fallen out of favour, so further research may be needed.

These services allow an investor to review the performance of funds from many different perspectives (eg, fees, investment style, and risk-adjusted performance). It is possible to screen the databases (which are accessible on the websites of these companies) for a fund that matches any specified criteria. For example, if an investor wants to invest in a fund that has exposure to Asian equities excluding Japan, where the investment style adopted is growth from large-cap companies, and where the standard deviation of the returns over the last three years has been below a specified amount, this can be achieved by using platforms such as Morningstar.

ESG Ratings

It will also need to be assessed whether the ethical, responsible and sustainable investment strategy applied to the fund is appropriate, if applicable.

Environmental, social and governance (ESG) rating providers are an important reference for financial markets in terms of assessing that the underlying securities or projects are as sustainable and responsible as they claim to be. For example:

- **Moody's ESG** provides research and guidance to organisations and investors interested in a responsible, sustainable or ethical approach.
- **MSCI ESG Ratings** ranks companies worldwide (the highest being AAA and the lowest being CCC) based on the company's management of its financially relevant ESG risks and opportunities.
- **Morningstar's Sustainalytics** rates the sustainability of listed companies. Morningstar itself provides Sustainability Ratings on approximately 20,000 mutual funds and ETFs.

However, each ESG rating provider uses their own research methodologies to scrutinise businesses – this, along with subjective interpretation, can result in ESG ratings varying dramatically for the same product. Steps, therefore, need to be taken to improve the transparency of these methodologies.

Other tools for evaluating a company's performance towards sustainable development include:

- compliance (or lack thereof) with stewardship codes and regulation

- alignment with global or national targets on climate change mitigation and how their outcomes contribute to those targets, and
- inclusion in a responsible, sustainable or ethical index.

Additionally, a company's voting policies and track record can provide a useful insight into their environmental and social philosophy.

This is by no means an exhaustive list, but it gives an indication of the tools that are available.

With so many funds available, the performance and ESG rating agencies can provide a valuable way of filtering them down to a manageable number that can be reviewed to determine whether they are suitable for inclusion in a portfolio from a performance and/or ethical, responsible and sustainable perspective.

8.2 Inequality of Information

Making the 'right' financial and investment decisions can provide price of mind and financial security. However, investors can end up making poor decisions (ie, one that does not help them achieve their financial goals) based on too little or too much information, or reliance on the 'wrong' people. An excess of information can lead investors to make little effort or withdraw from the decision process altogether.

In order for investors to make rational and sound decisions, investment information needs to be sufficient but not so much as to overwhelm. Overload derives from excess quantity or too many options – especially where options provide similar information.

In addition to receiving the correct quantity of information, it needs to be at the required level in accordance with an investor's experience and knowledge. It is not uncommon for a person who has won or inherited a large amount of money, and has transitioned from being financially poor to wealthy, to make poor financial decisions and make losses initially.

Overload of information has a risk of investors not being able to 'see the wood from the trees' and who can become victims of mis-selling of unsuitable investments – sometimes taking the 'easy option' with the least effort. For example, a totally risk-averse investment with low returns is unlikely to be suitable in the long run.

Some investors simply will not or cannot understand financial information, let alone use it and those individuals would be best to employ a trusted financial adviser. Even those with an understanding of financial information may wish to appoint an adviser, since advisers must keep abreast of changing economic conditions, legislation and tax issues which may affect their clients' financial planning objectives, as well as the broad range of products and services on offer in a fast-moving industry.

8.3 Economic Statistics

Economic statistics provide essential insights into the overall performance of an economy. This data helps governments and policymakers to make informed decisions in relation to economic policy, and analysts and investors in relation to market trends and investment decisions. There is a broad range of

indicators available, covering areas such as production, employment, inflation and trade, each offering a different perspective on economic health. Some of the key economic statistics are covered below.

GDP and GNP

The key measures of the level of output of the economy are gross domestic product (GDP) and gross national product (GNP).

The GDP figure is perhaps the most important barometer of the overall prosperity and growth of an economy. It measures the total value of output produced in an economy, regardless of whom that belongs to

In contrast, GNP is the value of output of the participants in the economy and, therefore, includes net property income from abroad (ie, earnings arising from overseas investment and the ownership of foreign assets):

GNP = GDP + Net property income from abroad

It is also worth noting that the measure of gross national income (GNI) is recognised by the World Bank instead of GNP. GNI is the total income received by a country from its residents and businesses, regardless of whether they are located in the country or overseas:

GNI = GDP + Net foreign factor income

Note that the terms GDP, GNP and GNI are sometimes used interchangeably but, as we can see from the above, they have distinct meanings.

Retail Sales

Retail sales data provides an indicator of the amount of consumer retail expenditure activity, which is an important leading indicator of the level of activity in an economy. If consumer confidence is high, spending is likely to increase. Equally, if asset prices rise, then this will again (via the wealth effect) encourage greater confidence and more spending. Within these statistics, there are clear feedback loops that can be observed; for example, rising house prices can make consumers feel more confident about the future. If consumers are more confident, then they are more likely to take on major purchases, such as property – see Asset Prices, below.

Asset Prices

Statistics on asset prices are of great value to economic policymakers. The assets that are considered of most value are property (both commercial and residential) and the stock market.

Historically, house prices have been most important in the mind of the consumer. As house prices rise, consumers feel more confident and increase their spending. This is often referred to as the wealth effect.

Stock market values can deliver the same effect, albeit to a lesser extent.

These forces also work in the opposite direction. If asset values fall, the negative wealth effect can be equally powerful in a downward direction. Rapid asset price falls can trigger a significant contraction of demand. Therefore, the diminution in the wealth effect simply exacerbates the existing contraction of demand.

Consumer Confidence

There are regular surveys conducted of business and consumer confidence. They measure the responses of the sample group to a series of standard questions. As such, the results tend to be volatile over time.

Confidence then feeds into other indicators within the economy. If confidence is high, this will often encourage spending and other potentially inflationary forces. However, of itself, confidence is a reflection of other factors.

Most economists view consumer confidence as a lagging indicator that follows or confirms economic trends, while others consider it a leading indicator that provides an indication of future developments of households' consumption and spending.

Purchasing Managers' Index (PMI)

This is an index of the prevailing direction of economic trends in the manufacturing and service sectors. It is derived from monthly questionnaires from private sector companies that represent major and developing economies worldwide. Thus, the PMI is a leading indicator of the economic health for these sectors.

In these questionnaires, companies are asked to identify month-over-month changes in a range of areas including business output, new orders, backlogs of orders and employment. For each, they give a score of +1 (large improvement) to -1 (considerable deterioration). These objective questions are accompanied by a subjective 'sentiment' question, asking companies to forecast whether their output is likely to be higher, the same or lower in a year's time.

The scale for the PMI ranges from 0 to 100, with 50 indicating no change (ie, the sector is stable). A reading above 50 indicates improvement, with higher values reflecting stronger growth. A reading below 50 represents a decline, with lower values showing greater contraction.

Labour Markets

Another indicator that is very closely observed to analyse an economy is the utilisation of labour, such as the level of employment, the number of hours worked, and average earnings per hour (ie, the rate at which pay to workers, derived from payroll, is moving in the economy).

The most critical statistic is the level of unemployment (ie, the number of people that are seeking employment but are unable to find work, expressed as a percentage of the labour force) as it indicates the health of an economy. Typically, unemployment decreases in an expanding economy, and it increases drastically if an economy enters recession. The level of unemployment also influences investor sentiment or consumer confidence levels.

Historically, the relationship between unemployment and earnings has been inversely linked (ie, as one rises, the other falls). Globalisation and other so-called 'supply-side reforms' introduced into the labour market over the past few decades have made the market much more competitive, in turn putting downward pressure on wages (particularly for low-skilled workers).

Balance of Payments (BoP) and Balance of Trade (BoT)

The balance of payments (BoP) compares the inflows and outflows of exports and imports, thus providing a balance to understand the economic situation. A positive balance means more money is entering the economy, while a negative balance signifies more money is leaving.

The BoP is divided into three main accounts:

- **Current account** – records the imports and exports of goods and services. The current account is referred to as the balance of trade (BoT) and is divided into two parts: visible (trade in products) and invisible (service sector transactions).
- **Capital account** – records financial transactions that do not affect income, production or savings, such as the sale of copyrights.
- **Financial account** – tracks changes in international ownership of assets including foreign direct investment (FDI), portfolio investment and reserve account flows other investment and reserve account flows.

A deficit or surplus in the BoP typically stems from the current account – a deficit occurs when imports exceed exports. While not always a serious issue, persistent BoP deficits must eventually be corrected, as trading partners will not indefinitely finance them.

If the country faces a BoP deficit, its currency may devalue, in turn making imports more expensive and encouraging consumers to buy domestic goods, while making exports cheaper. However, if the deficit is financed by overseas debt, then it can raise concerns about economic stability, potentially prompting government actions such as raising interest rates to attract foreign investment, which can strengthen the currency.

Persistent surpluses or deficits can lead to challenges for central banks and governments as they affect exchange rates, interest rates and broader economic activity.

8.4 Lagging and Leading Indictors

8.4.1 Leading Indicator

A leading indicator can point to where the price might move to next. If a share price is falling and the indicator rises before the price actually does, it is considered a leading indicator (ie, the indicator predicts the rise). That said, leading indicators are not always correct so they should be viewed as guidance.

8.4.2 Lagging Indicator

All technical indicators are considered to be lagging indicators. They are based on historical data and do not predict a price direction. A lagging indicator is generally triggered by an event that has happened

and is relatively self-explanatory. To put it simply, lagging indicators measure something that has already occurred to help predict future success.

Below is a table of some of the most common types of indictors showing whether they are lagging or leading:

Indicator	Lagging	Leading
Total sales or revenue		X
Profit margin %		X
Total monthly sales	X	
Total monthly net profit	X	
Total annual cash flow	X	
Customer satisfaction	X	
How frequently customers trade		X
The average amount of commission earned each time a customer trades	X	
How much customers are charged		X
Customer cost	X	
Customer lifetime value		X
Daily trade volumes		X
Country Level		
Gross domestic product (GDP)	X	
Unemployment	X	
Average earnings/income	X	
Stock market level		X
Manufacturing activity		X
New business start ups		X
Consumer price index (CPI)	X	
Balance of trade	X	

8.5 The Economic Cycle and Asset Allocation

Economic indicators are key in helping investors to assess where the economy is positioned within its cyclical stages – whether it is in expansion, peak, contraction or recovery; and in turn, enables them to strategically adjust their portfolios to optimise returns and manage risk. Therefore, where an economy is in the economic cycle can directly influence asset allocation decisions.

This is illustrated by the investment clock, which shows how different sectors perform at various points in the economic cycle. The investment clock below describes the interrelationship between the economic cycle and various sectors.

Sectors which may be in favour with investors at each point in the economic cycle include the following:

1. **Cyclical and growth assets that should thrive in favourable economic conditions, and momentum sectors**: High duration bonds; interest rate-sensitive equities (eg, banks, technology and 'growth' stocks).
2. **Geographies, assets and sectors that are sensitive to economic cycles**: High-yield bonds; cyclical stocks (eg, industrials, materials); emerging market equities.
3. **Assets with the potential for continued earnings growth**: Broad exposure to equities, including both domestic and international markets.
4. **Defensive assets that should outperform as interest rates start to stabilise or decline**: Short duration bonds; defensive stocks (eg, utilities, consumer staples, healthcare).
5. **Focus on quality and liquidity**: Government bonds and investment grade corporate bonds; defensive stocks; cash.
6. **Safe haven assets during times of economic uncertainty**: Government bonds (eg, US Treasuries); defensive dividend stocks; gold and precious metals.

However, this assumes that the investors and traders know exactly where in the economic cycle the economy is positioned, and the extent to which a market sector is operationally geared to the cycle. Moreover, it does not provide any latitude for unanticipated events that may spark a sudden flight from, say, equities to government bonds through a change in the risk appetite of investors, or change the course that the economic cycle takes, among others. Each economic cycle is different, and investors' behaviour may not be the same as that demonstrated in previous cycles.

8.6 Market Structure

In economics, market structure is the number of firms producing identical products that are homogeneous (ie, they are perfect substitutes for each other, so buyers perceive no real or actual differences between products that different firms offer).

8.6.1 Perfect Competition

Perfect competition is an ideal type of market structure. It is a theoretical representation of how a perfectly free market would operate where no one buyer or seller can influence the price of a single homogeneous product. A perfectly competitive firm operates within an industry containing an infinite number of firms, each of which accepts the market price for a homogeneous product set by the interaction of consumer demand for the industry's total supply. In the long run, perfectly competitive firms only generate **normal profits**.

The characteristics of a perfectly competitive industry are as follows:

- Not one firm dominates the industry, which contains an infinite number of firms.
- Firms do not face any barriers to entry or exit from the industry.
- All firms in the industry produce a single homogeneous product.
- There is a single market price at which all output produced by any one firm can be sold.
- There is an infinite number of consumers who all face the same market price.
- Perfect information about the product, its price and each firm's output is freely available to all.

If one firm was earning 'supernormal profits' then other firms would enter the market, supply the goods, and thereby drive down the availability of profits until the supply matched the demand and supernormal profits were eroded.

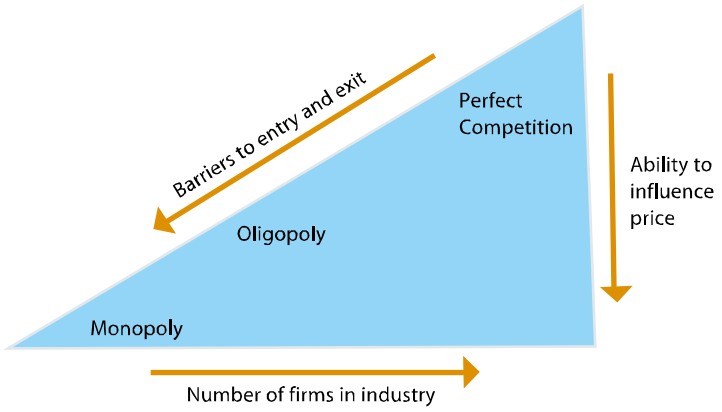
8.6.2 Monopoly and Oligopoly

Companies operating in a market or industry can gain market power, allowing them to prevent other mutually beneficial gains from trades occurring. This can lead to inefficiency due to imperfect competition. Companies may artificially fix prices higher and moderate output when compared to free-functioning competitive markets where there are many suppliers.

A pure monopoly is a market structure with only one producer or supplier, while an oligopoly exists where a limited number of highly interdependent firms dominate an industry.

The diagram below provides a simplified representation of these different market structures:

Industrial Structure



Although it does not necessarily follow that in all industries the greater the number of firms, the more competitive the industry, for the purposes of simplifying the analysis of firms' production decisions based on profit maximisation, it is a useful assumption to make.

9. Market Price Influences

Learning Objective

1.6.3 Know key factors that influence market prices: company announcements; research material; credit ratings; market liquidity; bid-offer spreads; the media

9.1 Announcements

Once companies have obtained a **listing**, they are subject to strict rules and regulations set by the relevant regulator, known as continuing obligations. Among other things, these obligsations require a company to promptly make public all price-sensitive information and issue the annual and interim report and accounts to shareholders within a set time frame.

Price-sensitive information is information that would be expected to move the company's share price in a material way once in the public domain. This includes details of any significant change to a company's current or forecast trading prospects, dividend announcements, directors' dealings and any notifiable interests in the company's shares. (Note that using price-sensitive information for personal gain before it is made public constitutes insider dealing, which is illegal and punishable by law.)

In the UK, for example, a notifiable interest is where a shareholder or any party connected to the shareholder has at least a 3% interest in the **nominal value** of the company's voting **share capital**. In such cases, they must inform the company of their interest within two business days.

9.2 Financial Communications

Financial communications and reports from numerous bodies, both in the private and public sector, are a vital part of the tools required for the research and analysis functions that are crucial to decision making about investment strategies and asset allocation. See section 8.1.1 of this chapter for more information.

9.3 Credit Ratings

A credit rating estimates the credit worthiness of an individual, corporation or even a country. For corporate and sovereign credits, a rating is an evaluation provided by credit ratings agencies of a borrower's overall credit history. It offers a classification system enabling a lender or investor to estimate the probability of the issuer of a credit, such as a bond, being able to make repayment in accordance with the terms of the borrowing, or more specifically the offering prospectus for a bond issuance.

A major factor in the credit rating given to a bond is its level of security and its ranking in the event of bankruptcy. When there are multiple forms of debt, the issuer will have to establish an order as to which debt will be serviced and the so-called seniority within the entity's capital structure in the event of financial difficulties leading to a re-structuring or liquidation. In broad terms, the seniority of debt falls into three main headings:

- **Senior Debt** – a class of corporate debt that has priority with respect to interest and principal over other classes of debt and all classes of equity by the same issuer. Senior debt is often secured by collateral on which the lender has put a first lien or charge in place. Usually this covers all the assets of a corporation, and is often used for revolving credit lines. Senior debt has priority for repayment in a debt restructuring or winding up of a company.
  However, in various jurisdictions and under exceptional circumstances, notwithstanding the nominal label given to senior debt, there can be special dispensations that may subordinate the claims of senior debt holders. Holders of particular tranches of debt which may have been designated and sold as senior debt may find that other claimants have super-senior claims.
- **Subordinated** – subordinated debt or bonds have accepted that their claim to the issuer's assets ranks below that of the senior debt in the event of a liquidation. As a result of accepting a greater risk than the senior debt, the subordinated borrowing will be entitled to a greater interest rate than that available on the senior debt.
- **Mezzanine and Payment in Kind (PIK)** – the mezzanine level of debt, if it exists at all, will be even riskier than the subordinated debt. It will rank below other forms of debt, but above the equity in a liquidation. As the riskiest debt, mezzanine debt will offer a greater interest rate than subordinated and senior debt levels.

9.3.1 The Main Credit Rating Agencies

The three most prominent global credit rating agencies that provide credit ratings – Standard & Poor's, Moody's and Fitch Ratings – operate worldwide. They all use similar methods to rate issuers and individual bond issues, essentially by assessing whether the cash flow likely to be generated by the borrower will comfortably service and ultimately repay its debts. However, the rating each gives often differs, although not usually significantly so – these variations can arise due to differences in each agency's criteria, methodologies and emphasis on certain factors. For example, one agency may place

greater weight on a borrower's market position, while another may focus more on financial ratios or economic conditions.

Rating agencies have received criticism in recent years, particularly during times of economic stress, for having methods of analysis that are seen as too inflexible. Critics argue that credit ratings often fail to provide an accurate picture of the credit risk posed by a bond, either because the agencies' systems are slow to react to real-world events or due to potential conflicts of interest, as they are remunerated by the issuers whose debt they rate. Since the global financial crisis, governments worldwide have introduced new laws on how rating agencies operate.

Governments have unique powers, such as raising taxes, setting laws, and controlling money supply, which generally makes them more creditworthy than other issuers. As a result, there is a greater proportion of sovereign ratings at the higher end of the scale than other sectors. That said, it is not unheard of for governments to default on their debts – Argentina, for example, has defaulted on its debt nine times in its history[4].

The rating agencies use a combination of several quantitative and qualitative variables (economic, social and political) in order to assign a credit rating to a debtor or to a debt instrument. When assessing the creditworthiness of sovereign issuers, the rating agencies will take into account several factors:

- **Political factors** play a key role in determining sovereign ratings, since the willingness of a government to pay is a crucial factor that distinguishes sovereign debts from corporate debts.
- **Economic factors** include per capita income, **gross domestic product (GDP)** growth, gross national product (GNP) growth, inflation rate, economic development, foreign debt to GDP, real exchange rate and default history.

9.3.2 Debt Instrument Rating Factors

The financial obligation to which a rating refers is usually a bond or similar debt instrument. The company wishing to raise money by issuing a bond relies on an independently verified credit rating to inform potential investors regarding the relative ability of the company to meet its financial commitments. The agencies themselves make it clear that they are not in the business of recommending the purchase or sale of any security but address only credit risk; the decision to buy or sell is for individual investors, based on their investment objectives, appetite for risk and other circumstances.

There are two types of issue credit ratings, dependent upon the length of time for which the financial obligation is issued. There are long-term and short-term issue credit ratings, each with their own set of standards. The latter relates to obligations originally established with a maturity of less than 365 days (and to short-term features of longer-term bonds). Ratings may be public or private. They provide opinions, not recommendations, and are derived from both audited and unaudited information.

It is important to appreciate that credit ratings are tailored to particular sectors. Ratings should be comparable across different sectors, but a rating may serve a very specific purpose in, say, the banking or insurance sectors; for example, the likelihood of a bank running into serious financial difficulty requiring support, and whether it will get external support in such an event.

4 Bloomberg, September 2019 (updated May 2020). One Country, Nine Defaults: Argentina Is Caught in a Vicious Cycle. Retrieved from https://www.bloomberg.com/news/photo-essays/2019-09-11/one-country-eight-defaults-the-argentine-debacles (Accessed: December 2024).

9.3.3 Investment and Sub-Investment Grades

Broadly speaking, the debt instruments with the lowest credit ratings will carry the highest levels of potential reward and risk.

Although the three rating agencies use similar methods to rate issuers and individual bond issues, the rating each gives often differs, though not usually significantly so. The scope of this analysis has recently been widened to take account of the size of an issuer's pension scheme deficit, and the nature and extent of its off-balance sheet liabilities.

Bond issues subject to credit ratings can be divided into two distinct categories:

- **Those accorded an investment grade rating**. The highest-grade corporate bonds are known as AAA or Aaa and these are bonds that the three agencies have deemed the least likely to fail. Bonds rated in the BBB/Baa category or higher are considered to be investment grade.
- **Those categorised as non-investment grade or speculative** (also known as high-yield or junk bonds). Securities with ratings in the BB category and below are considered high-yield or below investment grade.

	Moody's	S&P's	Fitch	Description
Investment Grade	Aaa	AAA	AAA	Gilt-edged quality, prime and maximum safety
	Aa	AA	AA	High grade with high credit quality
	A	A	A	Upper medium quality
	Baa	BBB	BBB	Lower medium grade
High yield/ Junk/ Speculative	Ba	BB	BB	Lower grade, speculative
	B	B	B	Highly speculative
	Caa	CCC	CCC	Substantial risk in danger of default
	Ca	CC	CC	Highly speculative, maybe in default
	C	C	C	Extremely speculative In default
		D	DDD	
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Very few organisations, except supranational agencies and some governments, are awarded a triple-A rating, although the bond issues of most large corporations boast an investment grade credit rating.

While experience has shown that a diversified portfolio of high-yield bonds will have only a modest risk of default (although this will vary, depending on how far down the credit rating scale they sit on

average), it is important to remember that the higher interest rates that they offer usually signals a higher level of risk.

9.3.4 Impact of Grading Changes

Ratings are regularly reviewed and are often revised in the light of changed economic conditions and/or changes in the outlook for an industry or the issuer's specific circumstances. Rating agencies will signal they are considering a rating change by placing the security on CreditWatch (S&P), Under Review (Moody's) or on Rating Watch (Fitch Ratings). Most revisions result in credit downgrades rather than upgrades. The price change resulting from a credit downgrade is usually much greater than for an upgrade, given that the price of a bond can fall all the way to zero, whereas there is a limit to how high a bond's price can rise.

A downgrade will also make future finance raising more expensive for the bond issuer, as investors will demand a higher return for the higher risk.

The ratings agencies have an unusual relationship with the principal participants in bond markets. On the one hand, their ratings are used by buyers of bonds, such as pension funds and other asset management companies, and regarded as independent and objectively determined. On the other hand, their instructions and appointment come from the seller of the bonds.

9.3.5 Assessing the Issuer

Determination of the characteristics of a particular issue and the quality of the issuer encompass the following:

- Current credit rating (which itself will reflect the issuer's specific prospects) and highlight default risk.
- The structure and seniority of the particular issue; for example, the bonds may be high or low priority in the event of default by the issuer, and may be structured in a way that gives the bonds particular priority in relation to particular assets (such as mortgage-backed securities).
- The credit rating and structure of the issue combined with prevailing yields available on other benchmark bonds (such as government issues in the same currency, with similar redemption dates), will determine the required **gross redemption yield (GRY)** – also called **yield to maturity (YTM)** – and therefore the appropriate price.
- Liquidity – the more liquid bonds tend to be more expensive, encompassing a liquidity premium and having lower bid/offer spreads.

9.4 Market Liquidity

The ease with which an issue can be sold in the market will affect the investor's perception of the risk of holding a bond. In specific markets, the volume of trading tends to concentrate on the benchmark stocks, or the on-the-run stocks, particularly in the government bond market, thereby rendering most other issues illiquid.

Other bonds become subject to seasoning as the initial liquidity dries up and the bonds are purchased by investors who wish to hold them to maturity. During market turmoil, difficulties can arise in the liquidity and trading conditions of bonds. In such conditions, investors prefer the most liquid instruments, which may force the price of these bonds to be out of normal alignment with similar bonds, which have a slightly different maturity date. This can result in a breakdown in complex strategies designed to exploit the spreads or price differences across the yield spectrum.

9.5 Research Costs

Learning Objective

1.6.4 Know how research costs are paid for

There are numerous other investment research firms which provide specialised information on specific sectors of the market as well as an overview of sector performance in general.

Securities research is a discipline within the financial services sector. Securities research professionals are known generally as analysts, research analysts, or securities analysts. Those analysts who are engaged by a brokerage firm are usually referred to as sell-side analysts. This differentiates them from buy-side analysts, who are engaged by asset management firms as part of their research efforts before they buy securities rather than sell them.

Traditionally, investors do not have to pay for research while using the broking houses services that provide research to retain clients and keep them happy. Investors expected this service and only had to ask their broker for research, and it was duly provided – seemingly without charge, although collective commissions and other fees would have covered the cost of the research.

In the UK and Europe, MiFID II banned the receipt of all monetary and non-monetary benefits by portfolio managers in relation to their services to clients, other than minor non-monetary benefits and with the exception of third-party research provided it is paid from either:

- a firm's own resources, or
- a separate research payment account (RPA) that is transparently funded by charges to clients and is subject to oversight requirements.

These requirements are a major shift from previous practices, where brokers provided research and asset managers accepted it as part of a bundle of services, with no specific charge. These rules aim to improve accountability over costs passed to customers and improve price transparency for both research and execution services. They also reduce conflicts of interest in asset managers by fully unbundling research-buying decisions from trade execution decisions.

10. Investment Theory

10.1 The Efficient Market Hypothesis (EMH)

Learning Objective

1.4.1 Be able to assess the main propositions and limitations of the efficient market hypothesis (EMH): strong form, semi-strong form, weak form, assumptions and shortcomings, impact of dark pools and big data on information efficiency

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The efficient market hypothesis (EMH) states that it is impossible to beat the market, as prices already incorporate and reflect all relevant information. It is also a highly controversial and often disputed theory.

Behind the EMH lie several key assumptions that underpin most finance theory models. Aside from investors being rational and risk-averse, they are also assumed to possess a limitless capacity to source and process freely available information accurately.

Market efficiency can be analysed at three levels, each of which has different implications for how markets work.

- **Weak form** – security prices fully reflect past share price and trading volume data. Consequently, successive future share prices should move independently of this past data in a random fashion, thereby nullifying any perceived informational advantage from adopting technical analysis to analyse trends.
- **Semi-strong form** – share prices reflect all publicly available information and react instantaneously to the release of new information. Consequently, no excess return can be earned by trading on that information, and neither fundamental nor technical analysis will be able to produce excess returns reliably.
- **Strong form** – share prices reflect all available information, and no-one can earn excess returns. Insider dealing laws should make strong form efficiency impossible, except where they are universally ignored.

Generally speaking, most established developed equity markets are relatively price efficient. Although testing for strong form efficiency is impossible, as inside information is required, the most conclusive evidence supporting the semi-strong efficient form of the EMH is that very few active portfolio managers produce excess returns consistently.

However, pricing anomalies and trends occasionally arise due to markets and individual securities under- and over-shooting their fundamental values. Consequently, active managers can outperform their respective benchmarks – often in quite a spectacular fashion when they succeed.

The assumptions and shortcomings of the theory can, therefore, include the following:

- Investors do not always invest rationally, thereby providing others with pricing anomalies to exploit.
- Investors frequently use past share price data, especially recent highs and lows and the price they may have paid for a share, as anchors against which to judge the attractiveness of a particular share price, which in turn influences their decision-making.
- The inability for all market participants to absorb and interpret information correctly, given varying abilities and how the information is presented.
- Stock market bubbles develop and eventually burst, which is a phenomenon that stands at odds with the EMH.
- Investors frequently deal in securities for reasons unrelated to investment considerations, such as raising cash or following a trend.

10.1.1 Big Data

Big data is a more recent 'buzz phrase', referring to large data sets that exceed the capability of more traditional systems for processing and analysing it. It is having a huge impact across a diverse range of industries.

Big data requires a set of techniques and technologies with new forms of integration to reveal insights from datasets that are diverse, complex and on a massive scale.

To date, the impact on investment management has been fairly limited, but this could present a window of opportunity for many industry participants. Big data technology increases the volume of data used in constructing investment models and the speed at which data can be processed, thus enhancing information efficiencies. See chapter 6, section 5 for more information on big data.

10.1.2 Dark Pools

MTF dark liquidity pools that provide anonymous trading. These execution venues do not display order details publicly, thereby preserving the anonymity of trading parties and minimising the degree to which their trading activity can impact the market.

These dark pool MTFs typically support large ticket-size trades at lower trading volume – and in many cases, they will not employ a CCP structure, with the broker standing as counterparty to the trade and a global settlement agent employed to provide trade settlement. Examples of dark pool MTFs include Morgan Stanley's MS Pool, Goldman Sachs' Sigma X, **Euronext** Block and Liquidnet.

10.2 Modern Portfolio Theory (MPT)

Learning Objective

1.4.2 Be able to assess the main principles of modern portfolio theory (MPT), the capital asset pricing model (CAPM), its application and limitations: risk-free rate of return; risk premium; cost of capital and return on capital; excess returns; correlation measures; risk and diversification; efficient frontier, portfolio optimisation and leverage; assumptions and shortcomings

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Modern portfolio theory (MPT) was developed by Harry Markowitz in 1952. The principles that he proposed now seem to be unremarkable, but at the time, the emphasis on diversification (and the mathematical model that enabled an investor to assemble positions which provide the best level of expected return for a given risk tolerance) helped to usher in a period of great innovation in investment theory.

Prior to the MPT, the received wisdom on combining securities in a portfolio was to screen securities that offered the most attractive opportunities for gain with the least risk and then add these together in a portfolio. Bringing individual securities together in such a fashion would often expose the portfolio to too many securities from the same sector, where the correlations between the returns among the securities selected were imprudently high. In other words, the portfolio lacked the benefits of diversification.

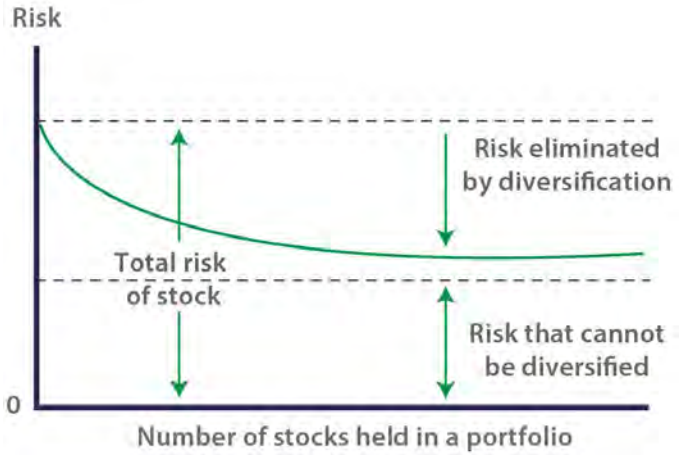
Markowitz's major contribution was to outline a framework for deriving the benefits of diversification for investors. They focused on how the overall volatility of a portfolio (considered to be the suitable proxy for its degree of risk) is calculated from the **covariance** matrix of the returns of its constituents.

MPT provided investors with a systematic procedure for evaluating different **combinations** of securities and selecting those combinations which provided the optimal reward for a given level of risk. The optimal allocations will be a trade-off between the risks that the investor is willing to tolerate and the anticipated returns. MPT states that by combining securities into a diversified portfolio, the overall risk is less than the risk inherent in holding any individual stock, reducing the combined variability of their future returns.

MPT states the risk for individual stocks consists of:

- **Systematic risk** – market risks that cannot be diversified away, hence it is also called undiversifiable risk and market risk.
- **Unsystematic risk** – the risk associated with a specific stock and can be diversified away by increasing the number of stocks in a portfolio, hence it is also called diversifiable risk and company-specific risk.

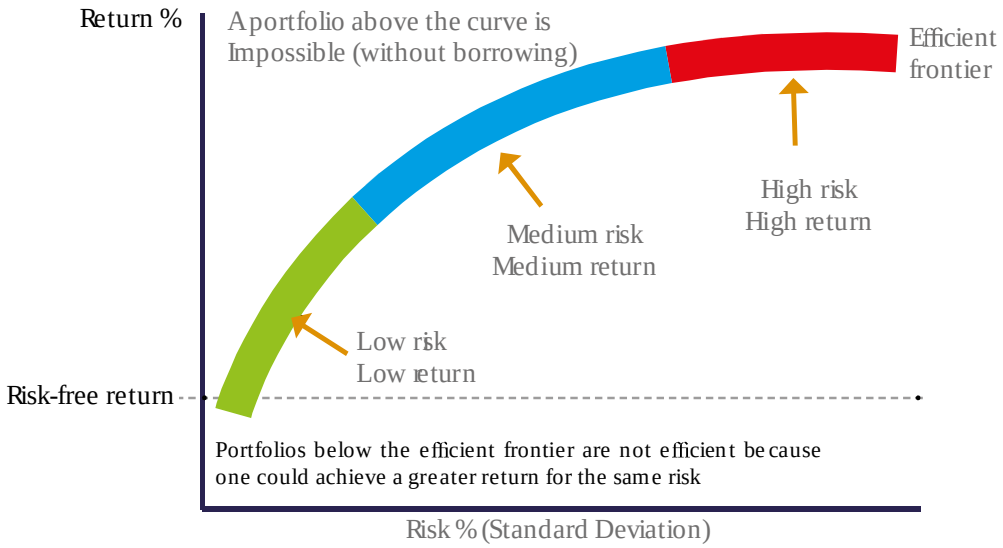
Thus, a well-diversified portfolio will reduce the risk that its actual returns will be lower than expected.



The process advocated by Markowitz enabled an investor to calculate the correlated portfolio volatility and the expected returns for numerous combination scenarios. From the range of possible portfolio combinations, there are a series of combinations that will optimally balance the risk and reward.

10.2.1 The Efficient Frontier and the Risk-Free Asset

The optimal combinations that maximise the reward for the different possible levels of risk lie on what Markowitz termed the **efficient frontier**.



The efficient frontier shows that different portfolios can have different levels of risk and return. Each investor decides how much risk they can tolerate and diversifies their portfolio accordingly. The optimal risk portfolio is usually determined to be somewhere in the middle of the curve because as an investor goes up the curve, they take on proportionately higher risk for lower incremental returns. Equally, positioning a portfolio at the low end of the curve is pointless, as an investor can achieve a similar return by investing in risk-free assets.

A risk-free asset is defined as one with certainty in terms of its future expected return. The actual instrument will depend on who the investor is and, in particular, their time horizon – after all, the best safe haven asset for a short-term investor is likely to be quite different from that of a long-term investor. A Treasury bill (ie, securities issued at a discount to par and pay off the principal of par at maturity) issued by a UK or even any of the EU governments, which is often used as a proxy for the risk-free rate in finance, may be free of risk to one investor. However, this may be risky to another, due to the potential for inflation expectations to influence the price of securities trading on secondary markets, and considering that the amount to be received in the future is in nominal terms; thus, if inflation were to rise unexpectedly over the holding period, the return in real terms would be much less. This inflation risk can be acute for the money market and fixed-income securities during high inflationary periods. Consequently, market participants have only found approximate proxies for a risk-free asset.

Investors can increase their levels of risk and return above that offered by the market portfolio, by borrowing funds (and as much as they wish) at the risk-free rate. In doing so, they can invest more than 100% of their investable funds in a risky market portfolio, therefore generating a higher return. However, while investors like return, they are generally risk averse, so this may not necessarily be a suitable solution.

Thus, a fundamental part of MPT is that constructing a portfolio with multiple securities, and guided by correlations between those securities, will lead to greater diversification, which will in turn reduce the risk of holding that portfolio.

10.2.2 Assumptions and Limitations

MPT is based on several key assumptions and limitations, as follows:

- **Investors are rational** – hence they aim to either maximise expected returns for a given level of risk, or minimise risk for a given level of return. This does not hold in reality, with emotions and cognitive biases often influencing investment decisions (see chapter 4.5 of this chapter on behavioural finance).
- **Financial markets are efficient** – ie, all information is already reflected in asset prices, and investors cannot consistently achieve returns above the market average through stock selection or timing. However, real-world market inefficiencies exist.
- **No transaction costs, taxes or other market frictions** – so investors can buy and sell assets freely without additional costs. These factors impact investment returns; and MPT's lack of consideration for these elements can lead to over-optimistic portfolio recommendations.
- **Investors hold a diversified portfolio** – which reduces unsystematic risk. However, achieving perfect diversification can be challenging, as correlations between assets can change during times of market stress, which reduces diversification benefits.
- **Asset returns follow a normal distribution** – (ie, most returns are clustered around the mean). In practice, asset returns often exhibit 'fat tails' (ie, extreme returns occur more frequently than the normal distribution predicts).
- **Past performance is a good prediction of future outcomes** – MPT relies heavily on historical data to estimate future returns, variances and correlations. However, this approach can be unreliable, especially during changing market conditions.
- **All investors have the same expectations for risk and return** – investors actually often have different risk appetites, financial goals and time horizons, which makes this assumption unrealistic.

- **Investors are only concerned with risk and return** – however, investors may also consider other factors such as ethical, responsible or sustainable concerns, which are increasingly important to many investors today.

Since its origins in the early 1950s, MPT has been developed into more sophisticated models, such as the capital asset pricing model (CAPM) in the mid-1960s and arbitrage pricing theory (APT) in the late 1970s; however, MPT remains the backbone of finance theory and practice today.

10.3 Capital Asset Pricing Model (CAPM)

The CAPM says that the expected return on a security or portfolio equals the rate on a risk-free security plus a risk premium; and that, if the expected return does not meet or beat this required return, then the investment should not be undertaken.

CAPM has some built-in assumptions:

- All market participants borrow and lend at the same risk-free rate.
- All market participants are well-diversified investors and specific risk has been diversified away.
- There are no tax or transaction costs to consider.
- All investors want to achieve a maximum return for minimum risk.
- Market participants have the same expectations about all assets' returns and **standard deviations**.

Using those assumptions, CAPM is used to predict the expected or required returns to a security by using its systematic risk (ie, its beta). We can use a security's beta in conjunction with the rate of return on a risk-free asset and the expected return from the market to calculate the security's expected return:

$$E(R) = R_F + \beta (R_M - R_F)$$

where:

E(R) = the expected return on the security

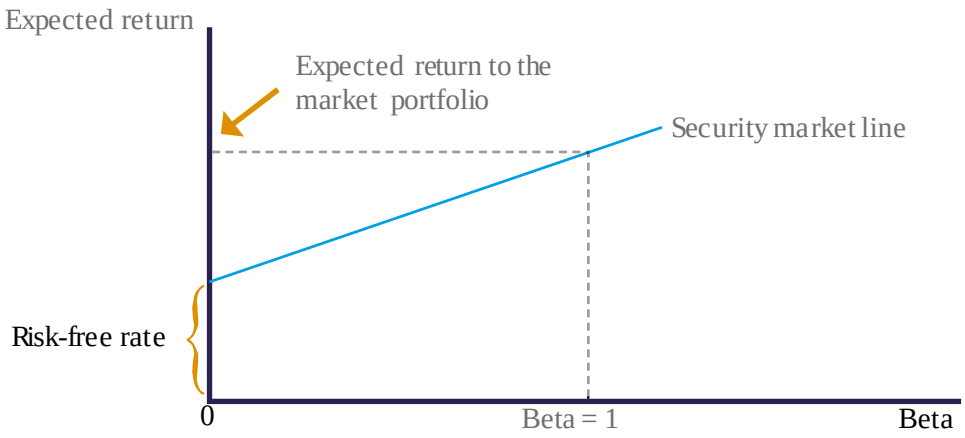
R_F = the risk-free rate

R_M = the expected market return

β = the security's beta

$(R_M - R_F)$ = the market risk premium

Using the CAPM equation enables what is termed the security market line (SML) to be presented graphically. If a graph is plotted depicting the expected return from a security against its beta, then the relationship is revealed as a straight line.



The SML shows that the higher the risk of an asset, the higher the expected return. The market risk premium is the return an investor will expect over and above the risk-free rate, as a reward for taking on the additional market risk.

We can use the CAPM formula to calculate the return we should expect from a stock. For example, if the current risk-free rate is 5% and the expected market return is 10%, what return should we expect from a security that has a beta of 1.5?

The beta of the individual stock tells us that it carries more risk than the market as a whole, and the CAPM formula tells us that we should expect a return of:

$$\text{Expected return} = 5\,\% + [(10\,\% - 5\,\%) \times 1{,}5] = 12{,}5\,\%$$

Therefore, by providing a precise prediction of the relationship between a security's risk and return, CAPM provides a benchmark rate of return for evaluating investments against their forecasted return.

10.4 Multi-Factor Models

Learning Objective

6.5.4 Understand the types and uses of multi-factor models, their assumptions and limitations

CAPM expresses a simple relationship between risk and return. It predicts the expected return on a security as the return on a risk-free asset, plus a risk premium. Because of this, the model is often referred to as a single-factor model – it focuses on only one factor: the security's sensitivity to the market, as measured by its beta.

However, the relationship between risk and return can be much more complex than what is captured by a single market index, as other factors may also influence a security's return. Different securities have different sensitivities to different types of market-wide shocks: inflation, business cycles, interest rates, and so on. Multi-factor models allow for different sensitivities, thus enabling a better understanding of each factor's contribution to a security's return.

10.4.1 Types of Multi-Factor Models

Multifactor models are broadly categorised according to the type of factors used:

Macroeconomic factor models	These models use macroeconomic variables that significantly explain asset class returns. These variables affect either the expected future cash flows of companies or the interest rate used to discount these cash flows back to the present. The factors in these models are generally assumed to be uncorrelated. Arbitrage pricing theory (APT) (see section 10.4.2) can be considered a macroeconomic factor model because it often incorporates macroeconomic variables (eg, interest rates, inflation and industrial production) to explain asset returns. Notably, though, APT is more flexible, as it can include any number of factors that affect asset returns, not limited to just macroeconomic variables.
Fundamental factor models	These models use company-specific attributes to explain cross-sectional differences in stock prices. Common factors include the book-value-to-price ratio, market capitalisation, price-to-earnings ratio and financial leverage. The Fama-French model (see section 10.4.3) is a fundamental factor model, as it uses company-specific attributes (eg, size, value, and market risk) to explain asset returns. The size and value factors, which the Fama-French model adds to CAPM, are both fundamental characteristics of stocks.
Statistical factor models	These models apply statistical methods to historical returns data to identify portfolios that explain past return patterns. In factor analysis models, the factors are the portfolios that best explain historical return covariances. In principal-components models, the factors are portfolios that best explain the historical return variances. The Carhart Four-Factor model (see section 10.4.3) is a statistical factor model that builds on the Fama-French three-factor model by adding a fourth factor: price momentum. This model is rooted in empirical data analysis, and uses past stock returns to identify the momentum factor.

Multi-factor models are attractive because they explain security performance more accurately than CAPM by multiple factors (or betas), require fewer assumptions, and enable portfolios to be constructed with exposures to specific risk factors. However, their shortcomings include a reliance on the identified factors being uncorrelated with each other, and stable relationships existing between security returns and these factors.

When constructing a multi-factor model, it is difficult to decide how many and which factors to include. Research suggests that the following four factors significantly influence security returns:

- Unanticipated inflation.
- Changes in the expected level of industrial production.
- Changes in the default risk premium on bonds.
- Unanticipated changes in the return of long-term government bonds over treasury bills (shifts in the yield curve).

Despite these challenges, though, multi-factor models provide a more detailed prediction of risk and return, thus improving our understanding of the factors that influence security prices.

Although there are differences between the various multi-factor models, they all share two basic ideas:

- Investors require extra return for taking on more risk.
- The models focus on risks that cannot be eliminated through diversification.

10.4.2 Arbitrage Pricing Theory (APT)

Learning Objective

1.4.3 Be able to assess the main principles behind arbitrage pricing theory (APT), its application and limitations: factor structure and analysis; macroeconomic and market factors; arbitrage theory and mechanics; relationship with CAPM; assumptions and shortcomings

Arbitrage pricing theory (APT) was developed in the late 1970s in response to CAPM's main limitation that a single market beta is assumed to capture all factors that determine a security's risk and expected return.

Rather than relying on a single beta, APT adopts a more complex multi-factor approach by:

- seeking to capture exactly what factors determine security price movements by conducting **regression analysis**
- applying a separate risk premium to each identified factor, and
- applying a separate beta to each risk premium depends on a security's sensitivity to each of these factors.

APT requires very little rational investor behaviour and implies that when a security drifts away from its rational price, perceptive investors will start to buy (or sell) it, thus driving prices back to their rational level. So wise investors may ensure that prices return to rationality, but at the same time prices would never deviate in the first place if it were not for the actions of less wise investors. In this sense, APT anticipates a significant dispersion in investor skill. Of course, arbitrageurs cannot act to profit from irrational behaviours unless price differentials are sufficiently large compared with transaction costs.

Anomalies in this theory are defined as empirical results and market behaviours to events that, unless adequately explained by conventional finance theory, will be construed to run counter to market efficiency.

Examples of factors employed by advocates of the APT approach include both industry-related and more general macroeconomic variables, such as anticipated changes in inflation, industrial production and the yield spread between investment grade and non-investment grade bonds.

The underlying assumptions of APT include the following:

- Securities markets are price efficient.
- Investors seek to maximise their wealth, though they do not necessarily select portfolios on the basis of **mean variance analysis**.
- Investors can sell securities short.
- Identified factors are uncorrelated with each other.

APT is attractive in that it:

- explains security performance more accurately than CAPM, by using more than one beta factor
- uses fewer assumptions than CAPM, and
- enables portfolios to be constructed that either eliminate or gear their exposure to a particular factor.

However, APT's shortcomings include a reliance on:

- identified factors being uncorrelated with each other, and
- stable relationships being established between security returns and these identified factors.

10.4.3 Fama-French Model and Cahart Four-Factor Model

The Fama-French model expands on CAPM by adding two additional factors: company size and value, in addition to the market risk factor in CAPM. Fama and French identified two types of securities that tended to outperform the market: small cap stocks (relative to large-cap stocks), and value stocks (relative to growth stocks). Securities favoured by the Fama-French model tend to be more volatile than the stock market as a whole, and the higher returns should be seen as compensation for taking on additional risk.

The Carhart Four-Factor Model, developed in 1997, further extends the Fama-French three-factor model by adding a fourth risk factor – price momentum. This additional risk factor captures a tendency for firms with positive (or negative) past returns to continue generating positive, (negative) returns for a few periods forward. This price momentum factor is estimated by comparing the average return of stocks with the best performance over the previous year with the average return of stocks with the worst performance in the same period. This factor is labelled 'MOM'.

11. Behavioural Finance

Learning Objective

1.4.4 Know the principles of behavioural finance

Behavioural finance aims to understand better and explain (through the use of psychology and other social sciences) how emotions and cognitive errors influence investors and the decision-making process – in other words, it describes how investors actually behave, rather than how they should behave. It recognises that investors sometimes act in their own best economic interests, and sometimes they do not. Assuming that MPT correctly describes how markets operate, behavioural finance describes how investors might best profit from that knowledge.

Behavioural finance can be thought of as including two different types of bias: cognitive biases (associated with how individuals process information) and emotional biases (where consumers may base investment decisions on feelings rather than fact).

In some cases, cognitive biases may be seen as the result of heuristics. Heuristics are best seen as mental 'rules of thumb', which investors and others use to make decisions. In many situations, particularly where individuals have to make decisions under time pressure, or are unfamiliar with the subject matter they are making, they will rely on such rules of thumb to allow them to make a quick decision. Hence, they are effectively mental shortcuts an individual unconsciously takes to reach a decision, rather than being prevented from acting due to indecision. In this sense, heuristics are helpful and, in many cases, will result in the right choices being made. However, like all shortcuts, heuristics run the risk of failing to take proper account of all the available information and, as a result, may lead to decisions which are biased in particular ways.

There are too many different types of biases to cover in this workbook – there are hundreds overall. We have included below some of the key biases.

11.1 Availability

One commonly identified heuristic is availability, which is the tendency for individuals to give more weight to easily available information. Thus, for example, if an individual can easily recall particular information regarding a topic, perhaps because it was recently featured in a newspaper or other publication, this information will significantly affect any relevant decision that the individual is required to make.

11.1.1 Confirmation Bias

Individuals are more likely to seek information that confirms their existing position than contradicts it, or perhaps interpret ambiguous information as supporting this viewpoint. As a result, they ignore potentially useful information that refutes their preconceptions.

11.1.2 Overreaction Bias

In some circumstances, they may overreact to new information, leading to investments being overbought or oversold and, in turn, anomalies in short-term price movements.

11.1.3 Herd Behaviour

The tendency for individuals to mimic the actions of others (often larger groups), whether those actions are rational or not. This often results in individuals being spurred into making decisions they would otherwise not have made on their own. Herd behaviour is also called herd mentality, crowd psychology or the bandwagon effect.

11.1.4 Anchoring

The tendency for individuals to fix on an initial value, or position, as an unconscious reference point, when making a decision and it tends to persist even when the individual is aware that the initial value is entirely random.

11.1.5 Overconfidence

The tendency to have exaggerated views of one's own abilities and judgements. Two examples of where overconfidence is perhaps most obvious are driving skill and sense of humour. Overconfidence can also be linked to the anchoring effect described in section 11.1.5 above, particularly when individuals are asked to estimate a range of possible values.

11.1.6 Gambler's Fallacy

This reflects a failure to appreciate the implications of randomness and probability. It is best demonstrated by considering a random process, such as tossing a coin.

Assuming a fair coin, the odds of tossing a head or a tail are equal – neither is more likely than the other. However, when individuals are asked which is most likely to follow a series of six heads, many instinctively answer a tail, even though a head or a tail is equally likely since it is a random event. In doing so, they are applying the concept of mean reversion that, since there has been a series of heads, a tail should follow in order to 'even things up'.

11.1.7 Representativeness

Where an individual applies categories to their decision-making. A scenario may be seen as representative of a broader category, and a decision made on that basis. Individuals are essentially applying an existing stereotype to a new situation.

11.1.8 Hindsight Bias

This is where investors find an event to have been entirely predictable after the fact; yet, before it, there was little to no evidence to suggest that it was going to. Hindsight tends to be prominent after periods of financial strain or crises, such as the global financial crisis; in reality, if the signs of a crisis were obvious prior to the event then that crisis could likely have been avoided. However, individuals often find comfort in the perceived understanding that hindsight brings, rather than admitting that they did not know what was happening.

Hindsight also links with the overconfidence bias, as hindsight can result in investors being overconfident in their future decisions, as they believe that they can foresee future events.

11.1.9 Naïve Diversification

A further example of cognitive bias, this concept reflects the fact that individuals often find it difficult to evaluate and choose between different options. For example, they may divide their money equally between all their investment options (regardless of what those options are), assuming that this reduces overall portfolio risk.

11.1.10 Mental Accounting

This term refers to investors' tendency to assign different parts of their overall wealth to different categories or mental accounts and to treat the accounts quite differently. In economic terms, this is referred to as a lack of 'fungibility'; in other words, money is treated as taking different forms and not transferable between different accounts. This represents a failure to recognise that all money is equivalent and therefore fungible, regardless of its source, or how it is categorised.

11.1.11 Loss Aversion

The concept of loss aversion is important for behavioural finance and is one of the principal ways in which behavioural finance differs from traditional finance. This concept says that investors do not experience gains and losses with equal intensity; rather, they experience a greater degree of emotional discomfort from a loss than the positive emotions they experience from a gain. Typically, investors feel the negative emotions associated with loss twice as strongly as the positive emotions derived from a gain.

11.1.12 Regret Aversion

This arises from the desire to avoid feeling the pain of regret resulting from a poor investment decision. Regret aversion can encourage investors to hold poorly performing shares, since avoiding their sale also avoids having to acknowledge the fact that a poor investment decision has been made. The wish to avoid regret can also bias new investment decisions, as people will often be less willing to invest new sums in investments or markets that have performed poorly in the recent past.

11.1.13 Sunk Cost Fallacy

Sunk cost fallacy is related to regret aversion, although they are distinct biases. While regret aversion is the tendency to avoid making decisions that could lead to feelings of regret, sunk cost fallacy occurs when investors continue investing purely because they have already committed resources to it, rather than evaluating it based on future costs and benefits. This is on the basis that people feel reluctant to 'waste' what they have already spent, even if cutting losses would be the more rational choice.

11.1.13 Framing

Framing refers to the tendency of individuals to be influenced by the form (or 'frame') in which decisions – or future prospects – are presented to them. In other words, rather than assessing all the available information on a neutral basis, individuals are influenced by the way the choice is structured.

End of Chapter Questions

Think of an answer for each question and refer to the appropriate workbook section for confirmation.

1. **What is fundamental analysis?**
   Answer reference: Section 2.3

2. **What type of assets can investors use to implement a long/short equity strategy?**
   Answer reference: Section 2.3.3

3. **What are the advantages and disadvantages of employing active strategies?**
   Answer reference: Section 2.3.5

4. **What is the core investment concept at the heart of hedge funds?**
   Answer reference: Section 4.3

5. **What is environmental, social and governance (ESG) investing, and why do investors need to take care with regard to terminology in this area?**
   Answer reference: Section 5.2.2

6. **What are the three types of account into which the balance of payments (BoP) is divided?**
   Answer reference: Section 8.3

7. **What is the difference between perfect competition, monopoly and oligopoly?**
   Answer reference: Sections 8.6.1 and 8.6.2

8. **What are the two distinct categories into which bond issues, that are subject to credit ratings, can be divided?**
   Answer reference: Section 9.3.3

9. **Describe the three forms of an efficient market.**
   Answer reference: Section 10.1

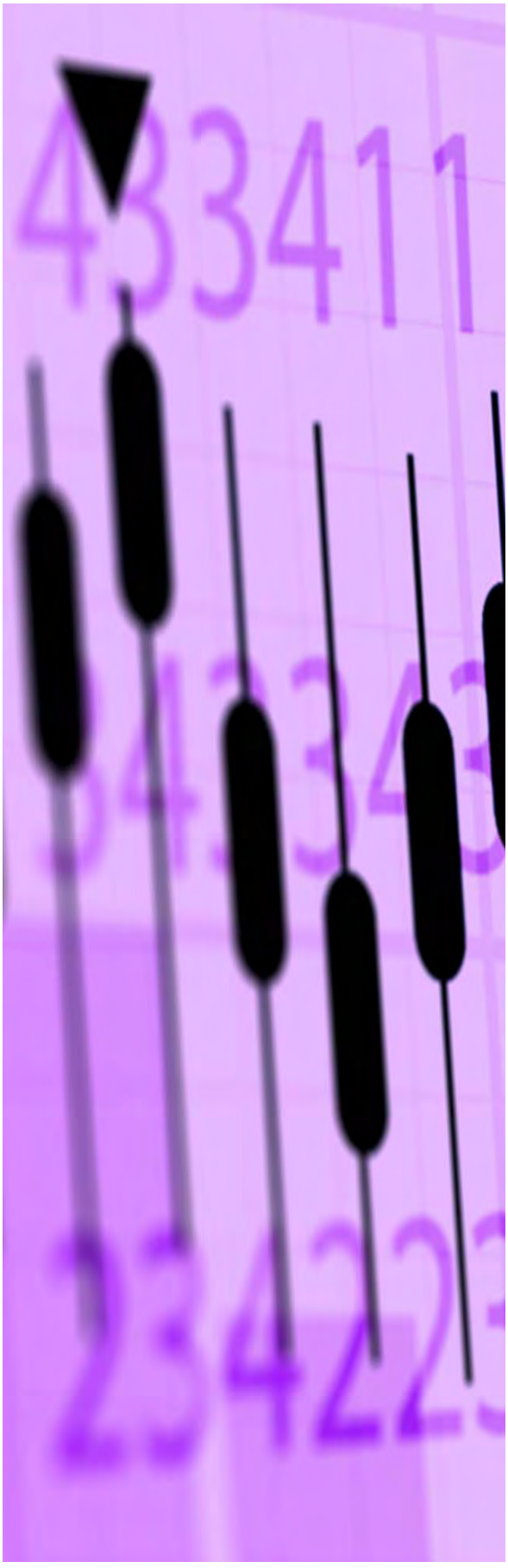
10. **What is the difference between the arbitrage pricing theory (APT) and the capital asset pricing model (CAPM)?**
    Answer reference: Sections 10.3 and 10.4.

Chapter Two

Managing Client Portfolios

1. **Fiduciary Issues** 81
2. **Investment Strategy and Client Suitability** 85
3. **Portfolio Management** 96
4. **Portfolio Risk** 101
5. **Rebalancing** 110

This syllabus area will provide approximately 10 of the 80 examination questions



1. Fiduciary Issues

1.1 Fiduciary Issues

Learning Objective

2.1.1 Understand stewardship responsibilities; issues associated with conflicts of interest and the duty to clients; transparency obligations

1.1.1 UK Stewardship Code

The UK Stewardship Code (referred to simply as 'the Code') was published in 2010 and has subsequently been updated over the years (the last of which was in 2024). Developed by the Financial Reporting Council (FRC) and the FCA, it is a set of principles directed at institutional investors who hold voting rights in UK companies. Its objective is to make institutional investors, who look after other people's money, more active and engage in corporate governance in the interests of their shareholders.

The point of dialogue is to hold corporate directors to account. It involves approaching issues with firmness, and being consistent and persistent. Dialogue:

- helps both sides to develop a mutual understanding of objectives
- alerts the company to investor opinion regarding the right balance between risk and reward for the attainment of long-term shareholder value
- alerts the company to investor opinion regarding expected return on investment
- helps fund managers question, seek clarification, and stay informed, and
- can be used to seek influence and change when and where appropriate.

What if dialogue is not enough? For example, the company may have a management team which is

not organising corporate resources in a way that maximises long-term value commensurate with risk taken. The company may, for example, be overly slow to adapt to new opportunities and risks, or have inadequate succession planning for key directors, among other reasons. Portfolio/fund managers may then seek to identify and agree with corporate directors areas of corporate underperformance, set targets, agree action, track progress and follow up on promises made. If a corporate board does not respond constructively, then portfolio/fund managers may wish to escalate their action; for example, by collaborating with other shareholders, or making a public statement in advance of the annual general meeting (AGM).

The Code is a voluntary code addressed to firms who manage assets on behalf of institutional shareholders, such as pension funds, insurance companies, investment trusts and other collective investment vehicles. Investment firms are expected to disclose on their websites how they have applied the Code; otherwise, they must provide reasons for not applying it ('comply or explain'). Pension fund trustees and other owners are also actively encouraged to participate, through the mandates given to fund managers.

The Code states that institutional investors should:

- Publicly disclose their policy on how they will discharge their stewardship responsibilities.
- Have a robust policy on managing conflicts of interest, in relation to stewardship and this policy should be publicly disclosed.
- Monitor their investee companies.
- Establish clear guidelines on when and how they will escalate their activities to protect and enhance shareholder value.
- Be willing to act collectively with other investors where appropriate.
- Have a clear policy on voting and disclosure of voting activity.
- Report periodically on their stewardship and voting activities.

Outside the UK, other countries/regions have their own stewardship codes; for example, in 2018, the European Fund and Asset Management Association (EFAMA) adopted a Stewardship Code with principle for asset managers' engagement with investee companies. While such codes are not compulsory, they are increasingly viewed as a condition if companies wish to retain business; in Japan, for example, GPIF (the country's largest pension fund) requires its external asset managers to be signatories of the Stewardship Code, which was introduced in 2014 and since revised.

1.2 Conflicts of Interests and Front Running

In the UK, the rules on conflicts of interest are contained in the Senior Management Arrangements, Systems and Controls Sourcebook (SYSC) in the FCA Handbook. They require that firms take all reasonable steps to identify conflicts of interest between:

- The firm, including its managers, employees, appointed representatives/tied agents and parties connected by way of control and a client of the firm.
- One client of the firm and another.

Firms under these obligations should:

- Prepare, maintain and implement an effective conflicts policy.
- Provide retail clients and potential retail clients with a description of that policy.
- Maintain and apply effective organisational and administrative arrangements designed to prevent conflicts of interest from adversely affecting the interests of their clients.
- If investment research is produced for external use, have appropriate information controls and barriers to stop information from these research activities from flowing to the rest of the firm's business.
- If a specific conflict cannot be managed away, ensure that its general or specific nature is disclosed.
- Keep records of those of its activities where a conflict has arisen.

Conflicts of interest rules apply if a firm owes a fiduciary duty to its clients and a conflict arises between its own interests and those of the client. From an investment management perspective, conflicts can arise in how a trade is executed, hence the best execution rules, and over how it is aggregated and allocated, hence the rules on those.

Conflicts can also arise as a result of front running. The practice of front running or pre-positioning (ie, dealing ahead of customer orders) has long been considered wrong since it takes advantage of knowledge of the order and its likely impact on the trading price. Thus, it may amount to insider dealing, and is prohibited under FCA's Market Abuse Regulation (MAR).

Other areas where conflicts of interest can arise include:

- **Investment research** – eg, a firm produces independent investment research that is likely to be disseminated to the firm's clients or the public; however, the analysts producing that research may have responsibilities to the companies they are researching, which could conflict with the interests of the individuals who receive the research.
- **Dealing ahead of investment research** – eg, if a firm allows employees to deal ahead of its independent investment research publication.
- **Inducements and commissions** – where a firm receives inducements and commissions (other than the standard commission or fee for that service) from a third party, or by the firm's own remuneration and other incentive structures, this may impair compliance with the firm's duty to act in accordance with the best interests of its clients.
- **Churning** – see section 2.3.5 of this chapter.

1.2.1 Order of Priority Given to Customer Trades

In the UK, the FCA has strict regulations regarding the fair treatment of clients, and all policies and procedures must be followed by law. Portfolio managers, and other involved parties, have a legal duty to disclose any material interest or conflict of interest when dealing on behalf of a client. They are also required to act honestly, fairly, and in the best interests of their clients.

Companies that are subject to MiFID are required to establish and maintain a written policy for the handling of conflicts of interest. The policy must identify both actual and potential conflicts of interest for all clients.

1.3 Transparency

Transparency in the securities markets may be defined as the degree to which information regarding quotations for securities, the prices of transactions, and the volume of those transactions is made publicly available.

Transparency can be divided into two discrete components: pre-trade transparency and post-trade transparency.

1.3.1 Pre-Trade Transparency

At its broadest level, this includes information accurately indicating the size and price of prospective trading interest, such as firm quotations in representative size, and resting limit orders, both at the best firm bid and ask quotations and away from such quotations.

Some markets, particularly those that have developed completely automated trading markets that display the entire contents of the limit order book for a particular security, permit total transparency.

Other markets permit lower levels of transparency, such as limiting the display of quotations to only the inside prices (ie, highest bid and lowest offer).

1.3.2 Post-Trade Transparency

This refers to the dissemination of trade price and volume of completed transactions from all markets trading that security.

The level or degree of transparency is an essential determinant of an effective market. Regulators and exchanges work to ensure the greatest degree of transparency to permit the investor to make an informed investment decision.

It is critical to note that pre-trade transparency alone is not sufficient for adequate levels of investor protection. Even if firm quotes exist, a substantial number of price-sensitive transactions may occur between or outside the spread. Although quotes may help investors decide where and when to trade, transaction reports help investors determine whether the quotes are reliable, and to assess the quality of the markets and transaction executions.

Also, all market participants attempt to anticipate market trends. There are few warnings of impending marked trends without trade and volume information. Market participants cannot respond quickly to selling or buying surges because they do not see them happening.

Maximum transparency requires the dissemination of transaction reports and quotations on a prompt, real-time basis.

2. Investment Strategy and Client Suitability

Learning Objective

2.2.1 Understand the factors to consider when establishing investment management relationships: mandate; client categorisation; objectives; risk appetite and existing risk exposure; suitability; impact of fees, charges, commission and tax; mandatory or voluntary investment restrictions; discretionary and non-discretionary portfolio management; limits of authority

2.2.2 Know the factors that dictate effective portfolio management: asset allocation; time horizons; liquidity requirements; diversification

2.1 Client Profiling

In investment management, everything is client-driven. The process begins by establishing the client relationship, defining their wealth goals, and assessing their risk tolerance through a risk assessment questionnaire. A key step in this regard is the creation of an investment policy statement (IPS), which outlines the client's return objectives, risk tolerance, investment time horizon, liquidity needs, tax considerations and regulatory constraints. For trusts and charities, it may also address the ability to distribute capital instead of income, liabilities and beneficiaries' tax status. Combined with capital market expectations, the IPS is then executed to meet the client's objectives.

Combined with capital market expectations, the IPS is then executed to meet the client's objectives.

To develop an IPS that is aligned with the client's requirements and to construct a portfolio that meets their objectives, the manager needs to gather detailed information about the client's financial situation and preferences, as this has a bearing on the asset allocation and overall investment strategy. We will consider the key factors, along with their influence on asset allocation, in the following sections.

2.1.2 Attitude to Risk (ATR) and Capacity for Loss (CFL)

Understanding the client's attitude to risk (ATR) is a vital part of the investment decision-making process. Various methods, such as questionnaires and bespoke software tools, can help to assess a client's comfort level with risk.

These assessments typically categorise clients into risk profiles, such as:

- **Cautious/conservative** (ie, lower ATR), suggesting that the client is prioritising stability and lower risk over the potential for higher returns. This is likely to result in a higher allocation to bonds or cash, and a smaller proportion invested in risk assets, such as equities.
- **Moderate/balanced** (ie, moderate ATR), indicating that the client is comfortable with a moderate level of risk and seeks a balanced approach to growth and stability. In this case, the portfolio might include a mix of equities, bonds and alternative assets, aiming for a reasonable level of growth with a moderate risk profile.

- **Adventurous/aggressive** (ie, higher ATR), indicating that the client is willing to take on substantial risk in pursuit of higher returns. This might result in a portfolio with a higher allocation to equities, potentially including more volatile or high-growth sectors; and fewer conservative assets such as bonds and cash.

It is important to note that a client's ATR may differ from their capacity for loss (CFL). While ATR is subjective, CFL is an objective measure of whether the client has enough income and assets to maintain a comfortable standard of living if their investment performs poorly. Clients who allocate a lower proportion of their overall wealth to risky assets are likely to have a higher CFL.

ATR and CFL are not static and can change over time, so they must be reviewed regularly with the client. A common example is that as clients get older and approach retirement, they may become more risk-averse, leading to a shift towards lower-risk investments (a process known as lifestyling); the speed at which this shift occurs (known as the glide path) will depend on the client's circumstances, and be influenced by market conditions, income needs and overall risk tolerance. Similarly, significant life changes – such as a job loss or health issues – can impact a client's financial situation and their willingness or ability to take on risk.

In some cases, a client may have a high ATR but a low CFL. In other words, the client is willing to take on risk, but may have limited assets or income outside their investment portfolio, thus making them vulnerable to financial strain if their investments perform poorly. If such a mismatch occurs, it is the adviser's responsibility to discuss the potential risks of the desired investment strategy with the client, and possibly recommend adjustments to reduce exposure to risk.

Ultimately, therefore, it is the CFL that drives the overall risk profile.

2.1.3 Investment Preferences

An adviser will also need to establish whether the client has any specific investment preferences that need to be considered within the investment strategy. These may take the form of restrictions or a requirement to follow a particular investment theme.

Some investors may wish to impose restrictions on what should be bought and sold within their portfolio. For example, they may impose a restriction that a holding cannot be disposed of or they may prefer to exclude certain investment sectors from their portfolios, such as armaments.

Alternatively, a client may want to concentrate solely on a particular investment theme, such as ESG or they may require the portfolio to be constructed in accordance with Islamic principles.

2.1.4 Liquidity Requirements

Liquidity requirements are an essential consideration when constructing a portfolio, as they ensure that a client can access funds when needed without incurring unnecessary losses. Clients may have known future liabilities or emergent cash needs, so an emergency cash reserve needs to be set aside. This reserve should be easily accessible without disturbing longer-term investments, and should ideally cover expected cash needs for at least three to five years.

To meet liquidity needs, the investment strategy may include a mix of assets that are readily realisable, such as bonds with varying maturities – as each bond matures, the funds can either be withdrawn or reinvested to maintain liquidity.

The client's required liquidity and investment timescale determine the choice of assets: those with high liquidity and short timescales may necessitate lower-risk assets such as cash and short-term bonds, but which offer lower returns. On the other hand, clients with lower liquidity needs and longer investment time horizons may be able to allocate a larger proportion of their portfolio to higher-risk, higher-return assets such as equities. Ultimately, ensuring sufficient liquidity is key to meeting both known commitments and unexpected contingencies.

2.1.5 Time Horizon

The client's time horizon is another critical factor. If the client only requires income, then the time horizon may be open-ended; but if capital growth is needed, then the client may intend to access some or all of their capital at a future date. In such cases, the liquidity and volatility of the underlying assets must be considered.

For example, if the client needs access to some capital in the next six months, then assets with daily liquidity and low volatility (eg, cash deposits) may be appropriate to preserve the value of the capital and ensure its availability.

For a slightly longer time horizon, bonds may be considered. Equities generally become suitable only if access to the capital is not needed for five years or more, as there is a risk of diminished value in the short term. Property, being relatively illiquid, should typically only be used in long-term strategies (ten years or more).

2.1.6 Tax Status

The tax status of a client also contributes to the shape of the investment strategy and portfolio construction, as the taxes on investment income or gains can significantly impact returns. The adviser must assess various factors, including the client's residency and domicile, income tax position (current and future), the impact of taxes on income and capital gains, available tax allowances, eligibility for tax-free accounts, and opportunities for deferring tax liabilities.

The client's tax status has a direct impact on asset allocation – eg, high yield bonds might be less suitable for a higher/additional rate taxpayer if held outside a tax wrapper, as the interest income would be subject to a higher rate of income tax than other investment income sources, thereby potentially eroding the after-tax return.

Understanding the client's marital status is also important, as it can further improve the tax efficiency of the portfolio. Interspousal transfers are generally free from capital gains tax (CGT) and inheritance tax (IHT), and if one spouse or civil partner has unused tax allowances for income tax, CGT or IHT then these can be utilised to reduce the client's overall tax burden. That said, such an asset transfer would require the client to be willing to relinquish control of those assets, which may not always be a comfortable or desirable option for everyone.

All in all, the adviser's understanding of the client's tax situation allows them to structure the client's investments in a way that minimises tax exposure, while ensuring compliance with tax rules and optimising after-tax returns.

2.2 Investment Mandate

Firms providing portfolio management services act under a mandate agreed with the client which authorises the firm to carry out discretionary investment services – the mandate sets out the scope of the arrangement, which will be limited rather than open-ended. Firms are required to undertake a suitability assessment before making a personal recommendation or providing investment advice, which will require the client to alter that mandate.

Further, firms with ongoing relationship with clients, such as those providing portfolio management services, are required to maintain up-to-date information about the client. Under MiFID, the suitability requirements also extend to capture all decisions on whether to trade, including any personal recommendations made to a client on buying, holding or selling an investment. In line with the **Consumer Duty**, firms must ensure that all recommendations and services are suitable for the client, providing appropriate outcomes and acting in the best interests of the client throughout the course of the relationship.

The suitability rules exist to ensure that authorised firms take reasonable steps to ensure that personal recommendations (or decisions to trade) are suitable for their clients' needs. When a firm makes a personal recommendation, provides investment advice or is managing a client's investments, in order to ensure its recommendations or decisions are suitable for the client, it should obtain the necessary information regarding the client's:

- knowledge and experience in the investment field relevant to the specific type of designated investment business being offered to the client
- financial situation, including the client's ability to bear losses, and
- investment objectives and the present risk profile of the clients.

When assessing suitability, firms are required to have policies and procedures in place to ensure that they understand the nature, features (including costs and risks) of instruments selected for clients and that enable the firm to assess whether or not any equivalent financial instruments could meet the client's demands and needs.

Note that suitability applies only to discretionary and advisory business; it does not apply to execution-only business.

2.3 Application of the Rules on Suitability

The COBS rules on the suitability requirements apply when firms:

- make personal recommendations (investment advice) relating to designated investments, including recommendations or advice on whether a client should buy, hold or sell a particular financial instrument, or

- manage investments of a retail client, and manage the assets of an occupational, stakeholder or personal pension scheme, other than in relation to the firm's MiFID, equivalent third-country or optional exemption business.

There are specific rules relating to the provision of basic advice (personal recommendations on stakeholder products); firms may, if they choose, apply these stakeholder rules instead of the more general rules on suitability when advising on stakeholder products.

For non-MiFID business, the rules only apply to:

- retail clients, or
- where the firm is managing the assets of an occupational, stakeholder or personal pension scheme, other than in relation to any MiFID, equivalent third country or optional exemption business carried out by a firm.

2.3.1 Assessing Suitability – Professional Clients

Under MiFID, a firm is entitled to assume that a professional client (both per se and elective professional clients) has the necessary experience and knowledge in that area:

- A per se professional client is an entity that is required to be authorised to operate in the financial markets (eg, an investment firm or a credit institution).
- An elective professional client is one that has stated in writing that they wish to be treated as a professional client for the purposes of making investments.

A firm is entitled to assume that a per se professional client is able to financially bear any related investment risks consistent with their investment objectives; however, they are not permitted to make this same assumption for elective professional clients.

2.3.2 The Suitability Report

As its name suggests, a suitability report is a report that explains to a client why the firm has concluded that a recommendation is suitable for them. Firms providing portfolio management services are required to undertake a suitability assessment should they make a personal recommendation or provide advice to a client that requires the client to alter that mandate.

The suitability report must, at least, specify the client's demands and needs, explain any possible disadvantages in relation to the transaction for the client, and explain why the firm has concluded that the recommended transaction is suitable for the client, having due regard to the information provided by the client.

Under MiFID II, firms that provide any investment advice (including a personal recommendation) to retail clients must provide them with a suitability report. This applies to any investment advice to acquire or sell any investment including equities, derivatives, structured products and unregulated collective investment schemes (UCISs).

The requirement also still applies to those products that were covered under the pre-MiFID II regime if the recommendation is to acquire a holding in, or sell all or part of a holding in:

- a regulated CIS
- an investment trust, where the shares have been or are to be acquired through an investment trust savings scheme
- an investment trust where the shares are to be held in an individual savings account (ISA) which has been promoted as the means for investing in one or more specific investment trusts
- buy, sell, surrender, convert or cancel rights under, or suspend contributions to, a personal pension scheme or a stakeholder pension scheme
- elect to make income withdrawals, purchase a short-term annuity, or enter into a pension transfer or opt-out.

A firm must also provide a suitability report if it makes a personal recommendation with a life assurance policy. There are some exceptions to the requirement to provide a suitability report:

- If a firm, acting as portfolio manager for a retail client, makes a personal recommendation in connection with a regulated CIS.
- If the client is habitually resident outside the UK or is not present in the UK at the time of acknowledging consent to the proposal form to which the personal recommendation relates.
- If the personal recommendation is made by a friendly society in connection with a small life policy sold by it, with a premium not exceeding £50 a year or, if payable weekly, £1 a week.
- If the personal recommendation is to increase a regular premium to an existing contract, or if it is to invest additional single premiums or single contributions to an existing packaged product, to which a single premium or single contribution has previously been paid.

In terms of timing, a suitability report must be provided:

- in connection with a life policy, before the contract is concluded – unless the necessary information is provided orally, or cover is required immediately (in which case the report must be provided in a durable medium immediately after the contract is concluded), or
- in connection with a personal pension scheme or a stakeholder pension, if the cancellation rules apply, within 14 days of concluding the contract, or
- in any other case, before the transaction is concluded unless the agreement is concluded using a distant marketing communication and if the client consents as soon as possible after the transaction is affected or executed.

If the transaction is the sale of a life policy by telephone and the only contact between the firm and client before the contract is concluded is by telephone, the suitability report must:

- Comply with the distance marketing rules, which are designed to protect consumers when contracts are concluded without face-to-face interactions. These rules vary between countries, with each jurisdiction having its own specific requirements.
- Be provided immediately after conclusion of the contract.
- Be in a durable medium (ie, the information provided must be stored in a way that allows the client to retain and access it for future reference). Examples include a letter or email that can be saved or printed.

2.3.3 Information Required to Assess Suitability

In order to carry out a suitability assessment, a firm should gather enough information from its client to understand the essential facts about them. It must have a reasonable basis to believe that (bearing in mind its nature) the service or transaction:

- meets their investment objectives,
- carries a level of investment risk which the client can bear financially, and
- carries risks that the client has the experience and knowledge to understand.

The basic information about a client's circumstances that need to be captured can be broken down into the following:

- personal and financial details
- liquidity and time horizons
- tax status, and
- investment preferences.

In relation to MiFID investment business, if a firm provides investment advice or portfolio management services, MiFID II also requires the firm to obtain information:

- in respect of the client's knowledge and experience in the investment field that is relevant to the specific type of financial instrument
- about the client's financial standing, including the client's ability to bear losses, and
- about the client's investment objectives, and risk tolerance/appetite.

In terms of assessing the client's knowledge and experience, the firm should gather information on:

- the types of service, transaction and investment with which they are familiar
- the nature, volume, frequency and period of their involvement in such transactions and/or investments, and
- their level of education, profession or relevant former profession.

Firms must not discourage clients from providing this information because the risk of laying out a particular transaction may result in the risk of the firm not providing the client with the most appropriate advice and the resultant risk of a loss of business to the firm. However, the firm is entitled to rely on the client's information, unless it is clearly out of date, inaccurate or incomplete.

If a firm does not obtain the information it needs to assess suitability in this way, it must not make a personal recommendation to the client or take a decision to trade for them.

Investment Objectives

When establishing an investment management relationship, the client's investment objectives are one of the central factors to assess. Collecting information about the client helps to start to build a picture of the client's needs, which can be classified along the lines of the following:

- Maximising future growth.
- Protecting the real value of capital.

- Generating an essential level of income.
- Protecting against (provision for) future events (eg, saving for children's education and protection policies to inheritance tax (IHT) planning).

This can be converted into an understandable investment objective, with classifications such as:

- income
- income and growth
- growth, and
- outright growth.

The purpose of this is to establish a common understanding of what the client is trying to achieve. There is a need to have common terms of reference so that any investment decisions are suitable for what the client is aiming to achieve, regardless of which named portfolio manager is responsible for the portfolio.

It is imperative to ensure that the client understands the terminology being used and agrees that the correct investment objective has been selected. A typical definition of each investment objective is as follows:

- **Income** – the client is seeking a higher level of current income at the expense of potential future growth of capital.
- **Income and growth** – the client needs a certain amount of current income but also wants to invest to achieve potential future growth in income and capital.
- **Growth** – the client is not seeking any particular level of income and their primary objective is capital appreciation.
- **Outright growth** – the client is seeking maximum return through a broad range of investment strategies which generally involve a high level of risk.

Once the client's investment objectives have been agreed, an investment strategy that can achieve these objectives needs to be developed. In developing an investment strategy, the following must be determined:

- Risk profile.
- Liquidity requirements.
- Time horizon.
- Tax status.
- Investment constraints and preferences.

We will look at each of these below.

Risk Profile

Volatility in the prices of investments or the overall value of an investment portfolio is inevitable. At a personal level, this translates into the risk that prices may be depressed at the time when the client needs funds and will mean that they will not achieve their investment goals.

A client needs to have a very clear understanding of their attitude to risk, as it is essential to choosing the right investment objectives. Risk attitude is a very subjective subject and is very dependent upon the

emotional make-up of a person. It is also objective as well, in that age will affect how much risk a client can assume because, as they get older, there is less time to recover from poor investment decisions or market falls and so appetite to take risks may change. Experience of investing and having wealth/assets already can also influence, in a greater way, the client's risk levels (otherwise known as the client's utility to risk).

Risk is an emotive subject, but establishing a client's risk tolerance need not be subjective. Rather, it should be based on the risk required to meet their investment goals – if the risk is too high, then the objectives must be adjusted.

Firms categorise clients by risk tolerance to guide investment selection. To ensure suitability, they must:

- explain risk in clear, understandable terms
- outline investment risks (especially for inexperienced clients), and
- justify recommendations based on the client's risk profile.

In assessing risk, the portfolio manager must not only consider the investments held within the managed portfolio but also any existing exposure that the client may have. For example, if a client already has significant holdings in a particular sector (eg, technology stocks), then further concentration in that sector could lead to overexposure and higher portfolio risk.

Client Liquidity Requirements

Liquidity refers to the amount of funds a client may need both in the short and long term. It is also essential to understand a client's liquidity requirements and the time horizons over which they can invest, as these will also impact the selection and construction of any investments.

If known liabilities may arise in future years, consideration should also be given as to how funds will be realised at that time – eg, a property purchase, paying school or university fees, medical expenses, or paying off debt. Consideration needs to be given as to whether it is sensible to plan on realising profits from equities, as market conditions may be such as to require losses to be established unnecessarily. Instead, conservative standards suggest investing an appropriate amount in bonds that are due to mature near the time needed to ensure the availability of funds.

In most cases, the funds required to meet these liabilities will be in the same currency as the client's current income or wealth (their **base currency**). In some cases, liabilities will be denominated in different currencies – if this is the case, special care will need to be taken to address any undesired currency risk. A common way of achieving this for high-net-worth clients is by using currency swaps or forward agreements to fix a particular foreign interest rate to protect from any adverse fluctuations in currency prices.

When a client has significant liabilities in relation to their wealth or earning power, that are due on a specific timescale, it will be necessary to develop clear strategies to meet them. It is quite possible that such liabilities could become a major focus in the wealth management process. In this case, it may make sense to work backwards from the future due date to the present to determine what level of investment and returns will be required at each step of the way.

When constructing an investment portfolio, an emergency cash reserve must be put to one side that the client can access without having to disturb longer-term investments. Keeping funds liquid brings the benefit of accessibility, but there is a trade-off in terms of returns: the most liquid investments (eg, cash or instant access accounts) will have relatively lower returns than other assets.

The lower the client's liquidity requirements and the longer their timescale, the greater will be the choice of assets available to meet the client's investment objective. The need for high liquidity allied to a short timescale demands that the client should invest in lower-risk assets such as cash and short-dated bonds, which offer a potentially lower return than equities; if the opposite is true, the portfolio can be more proportionately weighted towards equities.

Whatever their requirements, it is important that the client maintains sufficient liquidity to meet both known commitments and possible contingencies.

Time Horizon

Time horizon refers to the period over which a client can consider investing their funds. Definitions of time horizons vary, but:

- short term is usually considered to be from one to four years
- medium term refers to a period from five to ten years, and
- long term is considered to be for a period of ten years or more.

Time horizon is very relevant when selecting the types of investment that may be suitable for a client.

In considering the risk to an investor from purchasing and holding certain assets, it is vital also to consider the time frame of the holding period and whether the investor has resources sufficient to follow through on a long-term investment strategy.

It is generally stated that an investor should only invest in equities if they can do so for a minimum period of five years, if not longer. This is because equities are volatile, so can – and have – delivered negative returns over the short to medium term. Growth from equities comes about from long-term investment and the need to have the time perspective that can allow an investor to ride out periods of market volatility.

An investor whose goal is to meet some liabilities in, say, two years' time, may find that the appropriate investment vehicle is a two-year low-coupon investment grade government bond. This will be the case especially if the client is a higher or additional rate taxpayer as they will be able to benefit from a tax-free capital gain on these bonds at redemption (provided they were bought below par). For other taxpayers, a high-rate savings account is likely to be more attractive.

For an investor with liabilities to meet over the longer term (eg, in 20 years' time), equities may be appropriate as there is scope to protect the investor against the effects of inflation.

Time horizon will also influence the level of risk that can be taken in order to achieve the objectives. An investor with a long-term time horizon may be able to tolerate a higher risk, as any poor returns in one year will be cancelled by high returns in subsequent years before the portfolio is required to deliver its required outcome.

Tax Status

Establishing the client's tax position is essential so that their investments can be organised in such a way that the returns attract the least tax possible. This requires the portfolio manager to be aware of what taxes may affect the investor, such as taxes on any income arising or on any capital gains, how these are calculated and what allowances may be available. An adviser will also need to establish the client's residence and domicile status, as these will impact how any investments are structured.

Investment Constraints and Preferences

Some investors prefer to either exclude certain areas of the investment spectrum from their portfolios or concentrate solely on a particular investment theme, such as ethical, sustainable or responsible investment; or require the portfolio to be constructed in accordance with certain religious principles. Any constraints should be followed in construction of the portfolio and management of the investments, as should any restrictions regarding the inclusion of particular stocks or the sale of any holdings (eg, an inherited stock to be retained for sentimental purposes).

2.3.4 Impact on Performance of Fees, Charges, Commission and Tax

Investment performance can be reported before or after fees, charges, commissions and any taxes have been paid (ie, gross). Notably once all of these elements have been considered (ie, net), then the return provided to the client will be reduced. The more they have to pay, the lower their investment returns.

The fees paid for investment management services will vary widely depending on the kinds of arrangements and vehicles which an investor selects. These could range from investment management fees to performance fees and certain other costs, such as auditors' fees, custody fees, and marketing costs.

There are also charges that are external to an investment fund which the investor may incur. These can be briefly summarised as follows:

- Dealing charges, including commission and stamp duty, are payable to the broker carrying out the transaction.
- The spread is the difference between buying and selling prices, as set by market makers.
- Product wrapper charges, usually administration charges, may be charged by the manager of a wrapper used to hold the investment in the collective fund.
- Charges for advice may be incurred in addition if the investor takes financial advice.
- An up-front initial commission may be paid to an adviser, and there may also be a periodic trail commission payable to the adviser.
- Some advisers may agree to rebate part, or all of the commission received against fees for advice.

2.3.5 Churning and Switching

Churning is the activity of over-dealing and/or trading more frequently for a client in order to generate additional fees and/or commissions for the firm. It is relevant where a firm manages a client's portfolio on a discretionary basis, for example.

In contrast, 'switching' is the activity of selling one investment and replacing it with another.

In the UK, the FCA's guidance on churning and switching is contained in the COBS rules on suitability. It states that, in assessing suitability, a series of transactions that look suitable in isolation may not be so if the recommendations and/or the trading decisions to make them are so frequent as to be detrimental to the client.

Firms should consider the client's investment strategy when determining how frequently the firm should deal with them, including whether or not it is suitable to switch between packaged products.

2.4 Investment Policy Statement (IPS)

As we have seen, the financial advice process requires the establishment of the objectives, needs and risk profile of the client, along with the constraints that the investment firm will need to operate under. Best practice is to document these requirements in an investment policy statement (IPS) and execute an investment management agreement.

An IPS can be considered a summary of a client's investment objectives that captures their required returns, risk profile and any constraints under which the portfolio manager will operate. It sets these out along with the investment strategy that will be used to achieve the client's goals.

3. Portfolio Management

In effective portfolio management, time horizon and liquidity requirements are important factors that help shape investment strategies and ensure that they align with an investor's goals and risk tolerance. Recall from section 2.3.3 of this chapter that time horizon refers to the period over which an investor plans to hold their assets before needing to access funds, while liquidity requirements reflect the need for ready access to cash or assets that can be quickly converted to cash without significant loss of value.

Additionally, asset allocation (covered in chapter 1, section 5.1.2) plays a key role in managing risk and optimising returns, by diversifying investments across different asset classes.

Following this, we will now explore the importance of diversification in more detail, as it further enhances portfolio resilience and reduces risk exposure.

3.1 Diversification

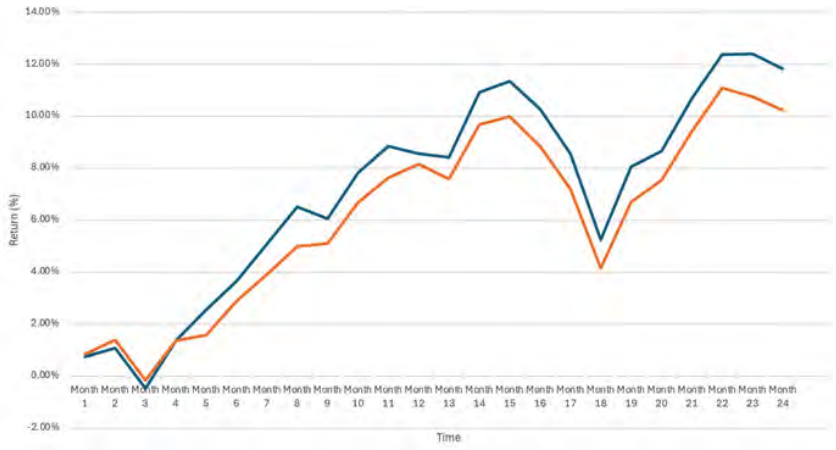
The very simplest idea is that, if an investor is seeking diversification in their portfolio holdings they would like to have, say, two assets where there is a low degree of association between the movements in price and returns of each. The degree of association can also be expressed in terms of the extent to which directional changes in their returns, or their co-movement, are related – in other words, their correlation.

Correlation measures the degree to which two assets move in relation to each other. It is a standardised value ranging from -1 to +1:

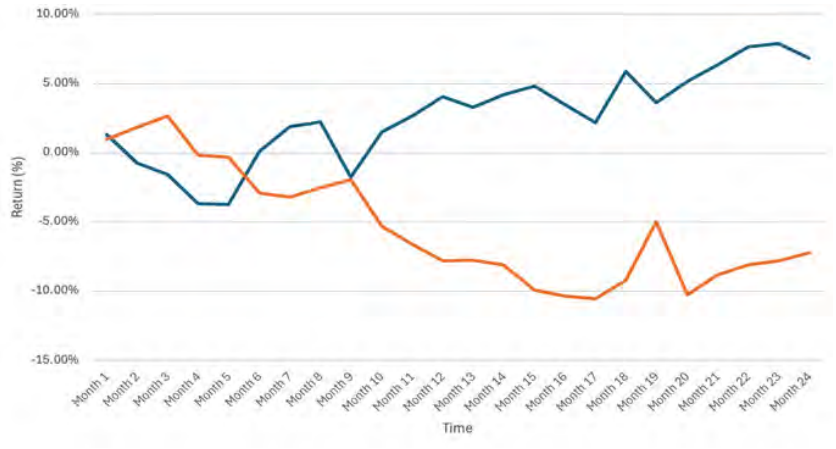
- A correlation of +1 means that the assets move up or down together in perfect unison.

In the case of a high positive correlation (typically considered to be +0.8 or more), it can be stated that the performance of the two assets track each other very closely. A portfolio with equal amounts of two assets A and B will tend to perform similarly to a portfolio made entirely of one of these assets, since both experience similar movements.

The chart below provides an example of two positively correlated assets – in this case by 0.97x. This is evident in the fact that as the value of one asset (represented by the blue line) rises or falls, the other asset (the orange line) tends to move in the same direction. While the correlation is strong, it is not perfect as there is a noticeable gap between the two lines; ie, their returns are not completely aligned, but still demonstrate a high degree of similarity in their movements.



- A correlation of -1 means that they move in exactly opposite directions.
  Consider a portfolio which holds equal amounts of assets A and B, but where the returns are highly negatively correlated (typically considered to be between -0.8 and -1). In this case, the inverse nature of the asset returns will tend to cancel each other out. As the value of asset A increases, this gain will be offset by a corresponding loss in asset B, thus reducing the overall portfolio's volatility and risk.



- A correlation of 0 means there is no predictable relationship between their movements.

From these examples, we can infer that when correlations are low or close to zero (ie, asset returns do not move in tandem), then gains in one asset are less likely to be offset by losses in the other. This can help to reduce the overall risk of a portfolio without sacrificing the return. This reduction in risk for a given level of expected return is the essence of **diversification**.

The benefits of diversification are realised when a portfolio contains a diverse range of assets, some of which may rise in respect to economic developments, while others may remain stable or decline. Therefore, the weaker the correlation between two assets, the greater the potential for diversification, which in turn reduces the overall risk of the portfolio.

While one asset (eg, an emerging market stock) may be considered higher risk in isolation, holding it alongside another asset that performs differently (eg, a developed market bond) can actually reduce the overall risk of the combined portfolio. This occurs because the two assets are less likely to experience similar fluctuations in value at the same time, thereby leading to a more stable overall return.

To quantify the diversification potential of combining securities when constructing a portfolio, two concepts are used: correlation, and covariance (ie, a measure of how two assets move together).

We will consider correlation and covariance in more detail in chapter 6, section 3.

3.2 Portfolio Monitoring and Reporting

Learning Objective

2.2.3 Understand key elements involved in managing a client portfolio: systematic and compliant approach to client portfolio monitoring, review, reporting and management; selection of appropriate benchmarks to include market and specialist indices, total return and maximum drawdown; arrangements for client communication

3.2.1 Portfolio Reporting and Client Communication

A key requirement for a portfolio management team is the provision of current, reliable and useful reporting on the current state of a client's portfolio. Clients will need to receive periodic documents, in a durable medium, outlining portfolio performance as well as other material relating to compliance and taxation-related matters. The client's professional advisers may often be the recipients of this information so that other financial management matters can be coordinated with investment management.

Given the complex nature of the investment possibilities available in the capital markets, along with the potential for clients to have exposure to different currencies, derivatives, hedge instruments and diverse asset classes then the task of presenting this information to a client becomes a major challenge for skilled investment managers.

The portfolio manager should be using state-of-the-art information technology and reporting software to generate timely information to a client. This may often have to be available in real time and accessible via the internet or distributed electronically. The issuance of hard copy statements is often a formality,

as the client will require more immediate information than something which is out of date as soon as it is printed.

IT systems are part of the systematic nature of portfolio reporting. In addition, the portfolio manager will need to ensure that other relevant contextual information is provided to assist the client in making the best use of the information being provided. Client reports may include to standard portfolio metrics, may be included in the reports issued to clients including key ratios such as the Sharpe and Treynor ratios which will inform the client as to the risk/reward ratio of the portfolio (see chapter 6, section 9). The investment skills and judgment of portfolio managers are largely determined by how their performance are calibrated by such ratios. However, these metrics may be confusing for some clients (especially those without a strong background in finance), so portfolio managers should provide clear explanations to aid clients' understanding. Alternatively, depending on the client's understanding and needs, portfolio managers may choose to omit these ratios, or replace them with more easily understood metrics.

3.2.2 Compliance and Monitoring in Portfolio Management

Portfolio management should address issues of compliance. The actual execution of the portfolio management strategy should be monitored regularly to ensure satisfactory progress against stated objectives, costs/charges and performance criteria. Part of the investment management function is to regularly review the appropriateness and effectiveness of measures to manage risks.

Relevant documentation, registrations and other matters of compliance with legislation, reporting and taxation should be considered vital to the portfolio monitoring process. In addition, the portfolio manager and their team need to keep abreast of all relevant changes in legislation and rules from financial regulators in order to ensure that they are complying with the most current methods of reporting and following industry best practice.

The most appropriate method for client communication is for information to be made available to clients on a current, probably real-time, basis via the internet. Many portfolio managers will provide clients with a monitoring facility enabling them to inspect their portfolio performance, at least in summary form, via web-based portals.

Meetings with clients should also be held periodically and at the client's specific request.

3.2.3 Assessing Portfolio Performance

The performance of a portfolio in isolation does not tell the whole story. Therefore, once portfolio performance has been calculated, the next step is to find a way of deciding how good a return that actually is. In other words, a benchmark should be referenced to which comparisons of the returns achieved can be referenced.

Selection of an Appropriate Benchmark

Investment performance is usually monitored by comparing it to an appropriate benchmark. There are three main ways in which portfolio performance is assessed:

- **Comparison with a relevant bond or stock market index.**
  - An index comparison provides a clear indication of whether the portfolio's returns exceed that of the bond or stock market index that is being used as the benchmark return.
  - As well as the main stock market indices that are generally seen, many sub-indices and specialist indices have been created over the years which allow a precise comparison to be made.
- **Comparison to similar funds or a relevant universe comparison.**
  - Investment returns can also be measured against the performance of other fund managers or portfolios which have similar investment objectives and constraints.
  - A group of similar portfolios is referred to as an investment universe.
- **Comparison to a custom benchmark.**
  - Customised benchmarks are often developed for funds with unique investment objectives or constraints.
  - Where a portfolio spans several asset classes, a composite index may need to be constructed by selecting several relevant indices and multiplying each asset class weighting to arrive at a composite return.

Holding Period Return and Maximum Drawdown

Holding period return (HPR) also called total return, is a measure of investment performance that includes the asset's price change plus any other income (including dividends, interest and capital gains distributions).

It is assumed that all income is reinvested over the period. The calculation of total return is expressed as a percentage of the initial asset value:

$$\text{Total Return (\%)} = \frac{V_1 + D - V_0}{V_0}$$

where:

V_0 = the initial asset value (ie, the purchase price)

V_1 = the final asset value (ie, the price received at maturity)

D = income received

Maximum drawdown (Max DD or MDD) is the largest peak-to-trough decline in the value of a portfolio. It is measured as the difference between the portfolio's highest value (often referred to as the 'high-water mark') to the subsequent lowest point. Maximum drawdown is a key variable used by portfolio managers, as it reflects the potential for loss in a portfolio. It is not fully captured by other traditional risk/return measures or portfolio theory, thus making it an important (although sometimes overlooked) consideration in performance analysis.

4. Portfolio Risk

Learning Objective

2.3.1 Be able to assess the following types of risk and their implications for investors: systemic risk; market risk – asset price volatility; currency, interest rates; commodity price volatility; investment horizon; liquidity; credit risk and default; counterparty risk; inflation; sustainability risk

4.1 Investors' Risks

There are a number of types of risk that investors face. These risks can be classified into two categories: unsystematic and systematic risks. We will now consider each of these in turn.

4.1.1 Unsystematic Risk

Some risks (known as unsystematic risk) are those which relate to a particular business, investment or share so they can usually be reduced through diversification. Hence, these types of risk are also known as specific, diversifiable, unique or non-systematic risk. Examples of unsystematic risk include the following.

Business Risk
Business risk is associated with the nature of a company's profits and dividends. They include factors such as product design, labour relations, the costs of raw materials, and the strength of the company's balance sheet.

Industry Risk
These risks can impact a particular industry and, in turn, companies within that industry. Examples include tariffs and barriers to trade, industry-wide strikes, changes in consumer taste and seasonal factors.

Management Risk
Such risks relate to the calibre of management of a company. For example, are the managers good enough to plan and manage the company effectively, or are they out of their depth and unable to cope with challenges?

Financial Risk
Financial risk is any risk associated with the nature of the financing options selected by a firm. For example, a company's assets may be financed through a mixture of debt and equity. A firm which is fully equity-financed has no financial risk, while incorporation of debt financing in the capital structure brings with it financial obligations to repay the coupons and principal on the debt at various stages. The more borrowing that a company has in its capital structure, the more risk that its shareholders are exposed to (known as gearing risk).

Liquidity Risk
This refers to how easily an investment can be converted into cash. Specific types of investment or market are illiquid (ie, they are hard to sell quickly for a fair price). During stressful periods this liquidity can diminish, and it can become much harder to sell a security readily. In extreme cases, the price quoted by the market-makers or investment bank may be for a relatively small amount of shares.

Counterparty Risk
Counterparty risk is the risk that the party to a transaction will fail to meet their obligations.

For exchange-traded instruments, there are clearing and settlement processes for each trade which ensure that the risk that the other party has to a trade is transferred to a clearing house entity which stands behind the trade.

The use of a central counterparty (CCP), such as the **London Clearing House (LCH)**, reduces the uncertainty and risk associated with counterparty risk. The risk that the other side of the transaction will default is reduced because they are replaced by one of the central counterparties, both of which are well capitalised and have insurance policies in place lessening the risk of default.

Counterparty risk is especially an issue in the OTC market as with the assets created and traded in the OTC market, there is always a risk that one of the parties will not be able to rely on the creditworthiness of the counterparty.

There are global initiatives to move the trading, clearing and settlement of OTC transactions to on exchange in order to reduce the risk of systemic collapse of the financial system.

Credit Risk and Default Risk
Credit risk refers to the general risk that counterparties may not honour their obligations. A subset of credit risk is default risk, which occurs when a debtor has not met its legal obligations – either when it has not made a scheduled payment or violated a loan covenant. Government bonds are sometimes described as having no default risk, as government guarantees mean there is little or no risk that the government will fail to pay the interest or repay the capital on the bonds (although, as we saw in section 9.5.1 of chapter 1, governments can default on their debts).

Although government guarantees reduce the risk of holding government bonds, it is important to remember that it is not eliminated altogether. Credit risk for other types of bonds needs to be carefully monitored, hence the reason why bonds will have security, insurance and covenants and be carefully monitored by the ratings agencies. The European sovereign debt crisis (which started in 2009 and ended in the mid-2010s) highlights this.

4.1.2 Systematic Risk

In contrast to unsystematic risk, other risks are difficult to avoid. These risks (known as systematic risk) are ones which affect the financial system as a whole. They are likely to affect pretty much all investments, as they are inherent in the aggregate market, so cannot be mitigated and removed by diversification. Hence, systematic risk is also called market risk, undiversifiable risk or aggregate risk. The main categories of systematic risk can be identified in overview under the following headings.

Default Risk

Capital may be lost if the deposit taker becomes insolvent and defaults (ie, cannot repay its debts) – eg, due to a harsh operating environment, high levels of borrowing, poor management or other financial miscalculations. Fixed-income investors have some access to alerts of possible credit defaults through credit ratings agencies such as Moody's.

Inflation Risk

Inflation risk refers to the impact that inflation has on the real value of money. Rising prices can reduce the purchasing power of an amount of capital or income. By investing money in assets that may not keep up with inflation, an investor may risk losing purchasing power of their investment; if an investor is locked in for a considerable period, then the final return may be unsatisfactory in real terms if inflation has risen unexpectedly. Even small amounts of inflation can significantly erode purchasing power over time.

Long-term investors in cash deposits face the real possibility that the final sum paid out including interest may buy less than the original sum invested would have purchased.

In 2022-23, during the cost-of-living crisis, inflation reached levels not seen in decades, outpacing the returns on many savings accounts and deposits. As a result, even those with short-term savings or reinvested interest faced substantial erosion of the real value of their deposits, as rising prices outstripped the growth of their investments.

The level of inflation in an economy can be an indication of its overall health, and of the steps that are being taken by the government to tackle issues (eg, unemployment). High levels of inflation are often associated with high interest rates, and vice versa.

Interest Rate Risk

This is the risk that interest rates move against the investor. For example:

- Investors invest in an asset with a fixed interest rate of 4% over three years; meanwhile, interest rates move up to, say 8%, but they are still locked into their lower rate.
- Higher interest rates mean it is more expensive for businesses to borrow, to fund any expansion of their activities.
- For consumers, their credit card or mortgage bills are likely to be higher so they spend less, reducing the profits that companies can make from their consumer activities.

Exchange Rate (or Currency) Risk

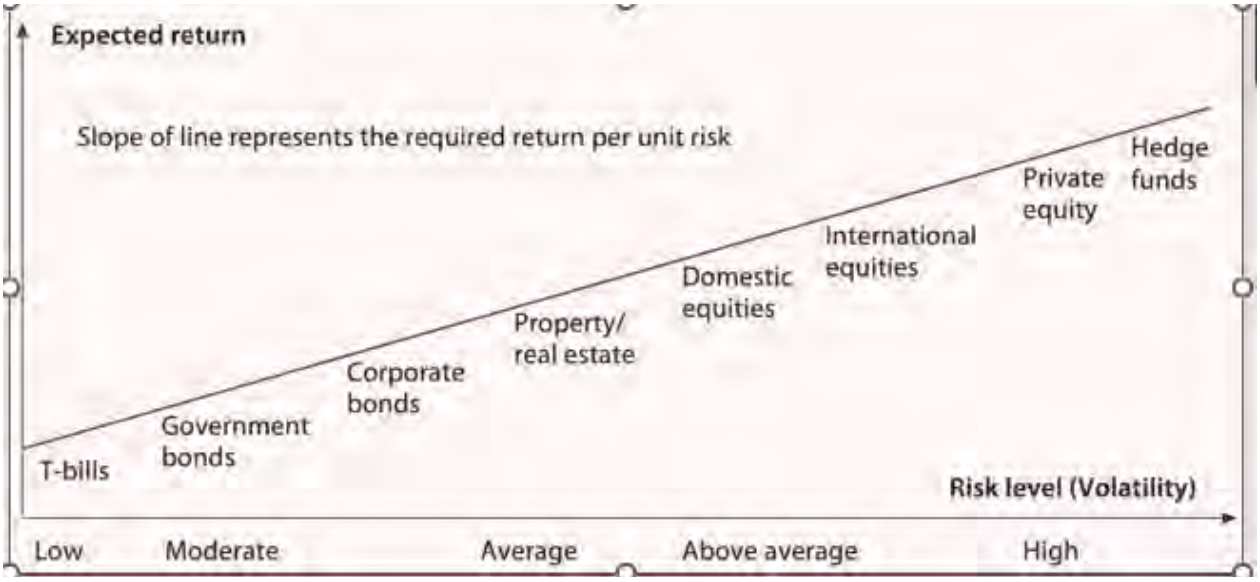
This arises from fluctuations in the value of currencies against one another. Any investor who purchases securities denominated in a foreign currency may suffer (or benefit) from changes in the exchange rates between the home currency and the other currency. In addition, an investor has to consider the risk that their base or home currency may fall against other currencies, thereby diminishing their purchasing power for global assets.

Asset Price Volatility

Volatility is the speed of change (ie, fluctuations) in price, either up or down. Strictly defined, it is a measure of dispersion around the mean (ie, average) return of an asset. Thus, asset price volatility is the uncertainty (ie, risk) about the expected future returns from an asset.

Price volatility is usually caused by economic or policy factors including inflation and interest rates, the central bank's current monetary policy and changes in other markets. While volatility is unavoidable and can present significant investment risk, it is not necessarily undesirable. As volatility increases, the potential for an investor to make money also increases. The trade-off is that the higher the volatility, the higher the risk.

On average, over the long term, equities have demonstrated higher price volatility than bonds – this is because bonds provide steady interest payments and the return of principal, as well as offering certain protections and guarantees, which equities do not.



Note that price risk can be either systematic or unsystematic. In a global economic crisis, price risk is systematic because multiple asset classes are affected; otherwise, the most common and effective tool to mitigate price risk is diversification.

Commodity Price Volatility

Similarly to asset price volatility, commodity price volatility is the volatility in market prices due to price fluctuations of a commodity. In contrast, though, commodity price volatility is primarily determined by politics, seasonal changes, technology and current market conditions, all of which can impact on the supply and demand for a commodity.

To give an example, an oversupply of crude oil results in the oil price falling over a six-month period. A company that is heavily investing in oil drilling will experience a fall in its profit margins, since it is

still operating at the same cost but its profits will decrease with the oil price. Thus, the company faces commodity price risk.

Sustainability Risk

Sustainability risks are increasingly in the limelight and gaining more attention from investors and regulators as clients want to switch into sustainable investments. The risk for the investor is that an environmental, social or governance (ESG) event occurs creating negative impact on the value of a company's shares. Other risks are investment performance from investors switching to more sustainable alternatives but not achieving the desired return.

4.2 Systemic Risk

Systemic risk is the risk of collapse of the entire financial system or entire market, as opposed to risk associated with any one individual entity, group or component of the financial system. (Systemic risk should not be confused with systematic risk, which is covered in section 4.1.2).

To say that the entire financial system might collapse may have appeared as an exaggeration until the global financial crisis. In this scenario, one bank experiences financial difficulties, which then has a cascading effect on other banks in the system that the first bank owes money to. This issue can raise concerns about defaults and liquidity in the banking sector, such that many fearful investors withdraw money in a 'flight to safety'.

One of the characteristics and vulnerabilities of the financial system which was exposed as a result of the crisis were the interdependencies in the credit markets and banking system. This meant that the failure of a single entity or cluster of entities could potentially cause a cascading failure, which could potentially have bankrupted or brought down the entire system. In turn, this causes widespread panic and chaos in the capital markets.

Insurance is often difficult to obtain against systemic risks because of the inability of any counterparty to accept the risk or militate against it because, by definition, there is likely to be no (or very few) solvent counterparties in the event of a systemic crisis.

The essence of systemic risk is that it is highly dependent on the correlation of losses. Under normal market conditions, many asset classes and individual securities will show a significant degree of independence of co-movement. In other words, their price action will be weakly correlated. When, however, markets become subject to financial contagion and panic, there is a tendency for most assets and securities to become much more highly correlated. In fact, the correlation can approach unity as their price behaviour will tend towards a uniform direction (ie, downwards) and because of the interdependencies between market participants, an event triggering systemic risk is much more difficult to evaluate than specific risk.

One of the functions of a central bank is to act as the lender of last resort in times of financial panic (see chapter 1, section 6.1) and to ensure that the money markets can still function when there is a systemic risk to the market.

4.3 Investment Horizon

In considering the risk to an investor from purchasing and holding certain assets, it is vital also to consider the time frame of the holding period and whether the investor has resources sufficient to follow through on a long-term investment strategy. Time horizon is considered in more detail in section 2.1.5 of this chapter.

4.4 Reducing Portfolio Risk

Learning Objective

2.3.2 Be able to assess how to reduce portfolio risk through diversification and hedging: significance of alpha and beta; correlation and relative risk; principles of asset allocation; hedging and immunisation; active and passive strategies

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One way to construct a low-risk portfolio is to buy low-risk assets, which usually leads to low returns. A more attractive approach is to buy risky assets which on average will give higher returns, and then reduce the risk in one of two ways, by:

- **hedging** out risk, or
- diversifying portfolio holdings.

4.4.1 Diversification and the Principles of Asset Allocation

As we saw in section 3.1, diversification involves spreading investment across a variety of assets whose returns move in different directions at different times. The degree to which two assets' returns are related is measured by correlation, which ranges from +1 (perfectly positive) to -1 (perfectly negative).

The key to reducing portfolio risk lies in holding assets with low or negative correlation. When correlations are weak or near zero, the assets' returns are less likely to move in tandem, thus helping to smooth out fluctuations in portfolio value. By carefully selecting assets with differing performance characteristics, an investor can reduce overall portfolio volatility without sacrificing return. This process of combining assets with low or negative correlation is the essence of diversification.

Asset allocation (covered in chapter 1, section 5.1.2) is a core principle of diversification. It involves strategically dividing investments among different asset classes (eg, equities, bonds, cash, property and commodities) to achieve a desired balance of risk and return. Different asset classes respond to economic conditions in distinct ways – for example, equities tend to offer higher returns during periods of economic growth, while bonds generally provide stability during recessions. As a result, asset allocation helps smooth out portfolio volatility, reducing the impact of market fluctuations and minimising the risk of significant losses from any single asset class. Ultimately, the optimal allocation is unique to each investor, shaped by their individual objectives, risk tolerance and constraints, and should be regularly reviewed to account for changing market conditions and evolving financial goals.

4.4.2 Hedging and Immunisation

The inevitable risks when investing in shares, bonds and money market instruments can be mitigated, but not entirely, removed by entering into hedging and immunisation.

Hedging

Hedging is a risk management strategy used to offset potential losses in an investment portfolio by taking an opposite position in a related asset or derivative (eg, options, futures and forwards). The goal is to reduce the impact of unfavourable market movements, although it does not eliminate risks entirely because it may not perfectly align with the underlying exposure, and derivatives come with a cost that inevitably impacts investment performance.

Hedging can be difficult to implement as it involves balancing many factors such as cost, market conditions, risk management goals, and instrument selection. It also becomes mathematically intensive especially where the investment portfolio contains complex instruments.

- Buying put options on investments can help the investor to remove the risk of a fall in value, but the investor will have to pay a premium to buy the options.
- Futures, such as stock index futures, can be used to hedge against equity prices falling – but the future will remove both the upside and downside potential.
- Forwards, such as currency forwards, could be used to eliminate exchange-rate risk – but, like futures, the upside potential will be lost in exchange for downside protection.

Immunisation

Immunisation is a passive management technique employed by those bond portfolio managers with a known future liability to meet, and is covered in more detail in chapter 1, section 2.2.2. By matching the duration of a portfolio with an investor's investment time horizon, this helps to protect against interest rate changes.

4.4.3 Active and Passive Management

Active Management

As we saw in section 2.3 of chapter 1, active managers are those that use discretion as to the timing of investments and asset allocation decisions and may change the composition of a portfolio on a regular basis. The underlying assumption is that the manager's expertise will enhance the fund's overall return.

Active managers can reduce portfolio risk in several ways; for example, by hedging against specific investment risks (eg, rising interest rates and inflation, changes in government policy, or declining liquidity), or liquidating assets in anticipation of bouts of market weakness or volatility. Thus, it is important for active managers to be nimble, in order to be able to take advantage of developing market events and trends as and when they occur.

A skilful manager can identify such opportunities, while a less skilful manager may suffer from not recognising them or be poor at timing their investment decisions.

Index-Based (Passive) Management

Passive management (covered in section 2.2 of chapter 1) aims to deliver returns that are aligned with the overall market performance, by holding the constituents of a market index or a representative sample thereof. This approach can reduce risk by offering diversification across various asset classes and industries, thereby reducing exposure to the volatility of any single security or sector. In addition, specialised tracker funds (eg, those targeting emerging markets or specific industry sectors) allow for exposure to niche markets while still benefitting from broad diversification.

The growing popularity of exchange-traded funds (ETFs) has further enhanced passive investment strategies by providing easy access to diversified portfolios that track specific indices and are traded on major exchanges. These funds help to reduce the costs and risks associated with active management, thus appealing to cost-conscious investors. However, like other passive strategies, ETFs still have their drawbacks, as they will mirror the market's performance (including downturns in bear markets) since they are designed to track an index regardless of market conditions.

4.4.4 Significance of Alpha and Beta

The terms alpha and beta in portfolios are measurements used by investors to assess and contrast performance and risk characteristics of investments/portfolios relative to their peers.

Alpha

Alpha (α) refers to the active or excess return that an investment/portfolio yields which is greater than an index or benchmark representing broader market trends.

Broadly, true active managers deliberately deviate from the benchmark portfolio compositions to deliver enhanced returns ('generate alpha'). Strategies employed to beat the index may focus on particular risks (eg, tilts in the sector, coupon, maturity, credit quality or weightings changes to preferred issuers), while ensuring that the aggregated characteristics to the benchmark index are still preserved.

While the alpha measurement is often described as a single number in reality, it is illustrating the percentage of performance with relation to how a portfolio performed compared to a benchmark index. For example, an alpha of 2.5 shows the investment or portfolio exceeded its benchmark index by 2.5%.

Beta

Beta (β) measures the volatility (or systematic risk) of a portfolio compared to the broader market; therefore, it helps investors to understand the level of risk that they will be willing to take in order to achieve a particular return:

- The beta coefficient is an important piece of the CAPM. The beta value helps investors understand the level of risk they will be willing to take to achieve the return for taking said risk:
  - If β=1, the portfolio/investment has a similar volatility to (and moves in line with) the market as a whole.
  - If β>1, it is more volatile than the market as a whole. For example, if a security has a β of 1.5, then it has 50% greater volatility than the market portfolio.

- If $0<\beta<1$, it is less volatile than the market as a whole. For example, a security with a beta of 0.7 has 30% less volatility.
- If $\beta<0$, then the security moves in the opposite direction to the stock market. The number gives the strength of this relationship.
- If $\beta=0$, so there is no clear relationship between the two.

A caveat to the alpha and beta measurements is that they are both backward-looking risk ratios; therefore, portfolio/fund managers must understand that any inferences drawn from these values is simply a reflection of past performance and no assurance of future events.

As a diagnostic tool, the total risk of a portfolio is decomposed into systematic factors or beta risks from each one of the underlying asset classes in the portfolio. For example, in a blended portfolio of bonds and equities, the equity beta risk is measured along with the bond beta risk.

Example

By decomposing the total risk of the portfolio into beta risks for each asset class, we can better understand how much market risk is coming from each component.

Further decomposing the risk into alpha and beta components allows for a deeper analysis of their pairwise interactions (ie, correlations) – between asset classes (beta to beta), managers (alpha to alpha), and between asset classes and managers (beta to alpha). Low correlation of returns across these components is desirable for diversification purposes, as it reduces risk. This analysis helps to identify the sources of return from both beta and alpha components; and by applying advanced optimisation techniques, it is possible to minimise a portfolio's overall risk while achieving the desired return.

The betas of the equity (1.2) and bond (0.5) components of the portfolio indicate how much each asset class is expected to move in relation to the broader market. However, from the information provided, we do not know the correlation between them – this figure determines how their returns move in relation to each other.

If the correlation is highly positive (ie, both equities and bonds tend to move in the same direction), then this limits the diversification benefit as their movements will amplify portfolio risk, even though they react to market fluctuations with different magnitudes.

Conversely, if the correlation is low or negative, they will move more independently – ie, when equities experience volatility, bonds may not be as affected or could even move in the opposite direction. This provides a diversification benefit, helping to smooth out overall portfolio risk.

Therefore, while the positive betas indicate both assets will generally follow the market's direction, a low or negative correlation between them allows for better risk reduction through diversification.

The main objective of the optimisation is to identify the best allocations by adjusting the asset classes (beta risk factors) or managers (alpha risk factors), or by replacing some of the assets and managers with alternatives available in the market. The optimisation procedure can introduce sets of constraints: maximum and minimum allocations to each asset class or manager within a target range, for example.

5. Rebalancing

Learning Objective

2.6.1 Be able to assess how changes can affect the management of a client portfolio: client circumstances; financial environment; new products and services available; administrative changes or difficulties; investment-related changes (eg, credit rating, corporate actions); portfolio rebalancing; benchmark review; client churn; time out of the market; portfolio turnover cost

5.1 Changes that can Affect a Client Portfolio

5.1.1 Client Circumstances

Individual investors and institutional investors have varying objectives and expectations.

Before advising any client, an adviser or portfolio manager must be aware of these various needs, preferences, expectations and the client's financial situation. The client's financial circumstances are subject to change over time – sometimes these changes can be anticipated and sometimes they will be almost entirely unexpected.

For example, if a client loses a regular source of income, even temporarily, there may be a need to liquidate a part of the client's holdings in order to raise cash. If the current portfolio has an adequate allocation of cash and short-term money market instruments available, this may not present any immediate issues. Alternatively, if part of a portfolio has to be liquidated, then this will alter the balance of the remaining assets and will require a re-balancing exercise to be performed at some future point in time, to restore the asset allocation in line with the proposed investment strategy.

The redemption of certain instruments may attract penalties and charges. The need to liquidate equities at a time when the overall market is performing poorly could lead to capital losses and loss of future dividend income. If there are derivatives in a portfolio, the timing of the exit from these contracts can be very sensitive and could trigger premature losses, which would not have arisen if the instruments were held to maturity.

5.1.2 The Financial Environment

The changes that can take place in the overall financial environment, and which will affect the current asset allocation strategy, can be drastic. For example, during the global financial crisis and the COVID-19 pandemic and subsequent cost-of-living crisis.

The impact of large-scale macro-economic factors (eg, an abrupt drop in GDP and employment, or the austerity measures that typically follow) will affect many clients' individual circumstances:

- Some clients may be faced with the loss of employment income, but the largest capacity for damage is to overall investor sentiment and the general appetite for risk.

- During periods when investors are more risk averse, then markets often experience increased volatility. Comparisons are often made to times of heightened uncertainty in past economic crises, in an attempt to gauge the potential for further market disruption and assess the likelihood of recovery:
  - This has meant that many investors have altered their attitude toward holding assets that they perceive to be too risky.
  - On the other hand, many think more opportunistically, and see the drop in asset prices as an excellent buying opportunity.

In reality, though, each market cycle has different dynamics; hence historical data is not always a reliable indicator of future outcomes. To give an example, the recent technology boom – driven by companies such as the 'Magnificent Seven' (Apple, Microsoft, Amazon, Nvidia, Meta, Tesla and Alphabet) – is quite different from the tech boom and subsequent dotcom bubble of the late 1990s/early 2000s. Today's tech giants are broadly profitable and well-established; whereas previously, many internet and tech companies were unprofitable, and the sector itself was still in its developmental stages.

5.1.3 Portfolio Rebalancing

If a portfolio has to be rebalanced (eg, due to changes in client circumstances or the financial environment), the proper approach for an adviser or portfolio manager is to re-assess the entire asset allocation strategy. Rather than making piecemeal changes and attempting to re–implement a revised version of the previous strategy, it is preferable to develop a new strategic asset allocation that reflects the new circumstances. This may lead to a reclassification of the investor's profile and risk tolerance characteristics.

However, it may not always be possible to rebalance immediately, for example if the client's assets are not held within a tax wrapper, and rebalancing their portfolio in line with the new allocation could trigger an unwanted tax liability.

There are other circumstances of a more routine nature where a portfolio manager will rebalance a portfolio. To some extent, the reasons why a portfolio manager may wish to rebalance are closely related to market timing and active management strategies.

5.1.4 Availability of New Products and Services

Financial innovation since the 1970s has been extraordinary. This has been especially the case in terms of the products which are now available to investors, such as contracts for difference (CFDs), exchange-traded funds (ETFs), new kinds of collective investment vehicles, and the proliferation of derivatives, including credit default swaps (CDSs) and other asset-backed securities (ABSs).

Among the different kinds of services available to investors are many types of hedge funds and alternative asset management companies, which provide non-traditional ways of investing. The availability of such a diversified offering of products and services is transforming the whole nature of the securities industry.

These changes question some of the underlying theories of investment and asset allocation, and certainly require professionals working in financial services to constantly re-educate themselves on the conditions and products of their business.

The need for prudence and skill in investment decision-making is perhaps at a premium more than ever. This is also leading to new attitudes towards allocation, the need for greater flexibility and pragmatism, and the possibility of fundamental changes in the regulation of the domestic and global financial environment.

5.1.5 Administrative Changes or Difficulties

The innovations just discussed, among others, will continue to impose a severe burden on the compliance and fund administration functions within investment management.

At the same time, there are pressures on active portfolio/fund managers to cut their fees and charges in order to remain competitive with their passive peers. The expectation is that there will need to be quite radical 'back office' changes at many investment firms.

5.1.6 Investment-Related Changes

Credit ratings for government and corporate borrowers are regularly reviewed and are often revised in light of several economic, financial and operational factors.

As we saw in section 9.3.1 of chapter 1, rating agencies will signal they are considering a rating change.

Most revisions result in credit downgrades rather than upgrades. The price change resulting from a credit downgrade is usually much greater than for an upgrade, given that the price of a bond can fall all the way to zero, whereas there is a limit to how high a bond's price can rise.

Corporate actions (see section 10 of chapter 4) will impact securities pricing. Under certain circumstances, the decision by a company to engage in a secondary offering or proposal to alter its capital structure might trigger a major response from the markets. These decisions may change a portfolio holding in the wake of the proposed corporate action.

5.1.7 Benchmark Review

As we saw in section 3.2.3, investment performance is usually monitored by comparing it to an appropriate benchmark. The choice of the benchmark will depend on the precise asset split adopted and should be compatible with the portfolio's risk and expected return profile.

However, a benchmark review may be required if it is no longer representative of the portfolio objective or risk, or if the benchmark contains assets to which the portfolio no longer has exposure.

It is essential that the portfolio manager and client agree on the frequency of portfolio reviews. This ensures not only the monitoring performance, but also that the benchmark:

- still aligns with the client's objectives
- is appropriately positioned given prevailing market conditions, and
- remains relevant.

5.1.8 Portfolio Turnover Costs

Turnover refers to the rate at which the investments within a portfolio are bought and sold. Whether an investor holds securities directly or indirectly through a fund, the frequency of transactions within the portfolio may impact the eventual rate of return experienced by the investor due to the costs involved in doing so, particularly if the level of trading is significant.

5.1.9 Time Out of the Market

Time out of the market can become a high-risk and costly situation during market volatility or a strong bull or bear market.

For example, an investor moving their portfolio from one manager to another may only be able to do so by selling all of their investments before the transfer of the proceeds then takes place. Alternatively, if their investments are retained for an 'in specie' transfer, then the manager from which the portfolio is being transferred may not be able to trade in those investments while the transfer is taking place. Either way, the investor could lose money if markets move against them in the interim.

Another example is where an investor is switching from one investment to another, as they may have to wait for the proceeds from the sale to settle before they can arrange the corresponding purchase.

5.1.10 Client Churn

It is vital that investment firms track statistics on client retention and loss. If a churn rate increases, the firm should investigate why its clients are leaving. The acquisition and marketing costs needed for new customers far outweighs the costs of keeping customers.

Firms who are unable to reduce their client churn rate often want to improve client retention, but they fail to make churn management a top priority.

End of Chapter Questions

Think of an answer for each question and refer to the appropriate workbook section for confirmation.

1. **What does the term 'front running' mean in regard to the activities of brokers and other financial intermediaries?**
   Answer reference: Section 1.2

2. **Describe the difference between attitude to risk (ATR) and capacity for loss (CFL).**
   Answer reference: 2.1.2

3. **For which products must a firm provide a suitability report to a client?**
   Answer reference: Section 2.3.2

4. **The correlation coefficient between two securities is –1. Explain what this means.**
   Answer reference: Section 3.1

5. **What is holding period return?**
   Answer reference: Section 3.2.3

6. **Explain maximum drawdown.**
   Answer reference: Section 3.2.3

7. **What type of investment management technique is immunisation?**
   Answer reference: Section 4.4.2

8. **What does beta measure?**
   Answer reference: Section 4.4.4

9. **Give an example of how time out of the market can become a high-risk situation.**
   Answer reference: Section 5.1.9

10. **An investor wishes to invest €15,000 in the shares of XYZ Corp, at €3.50 per share and an exchange rate of EUR/USD of 1.20. After one year, the shares rise in price to €4.00 – the investor sells the holding, and converts the sale proceeds back into EUR at a rate of USD/EUR of 1.25. Based solely on this information, calculate the holding period return in EUR terms.**
    Answer reference: Section 12.2

Chapter Three

Valuation

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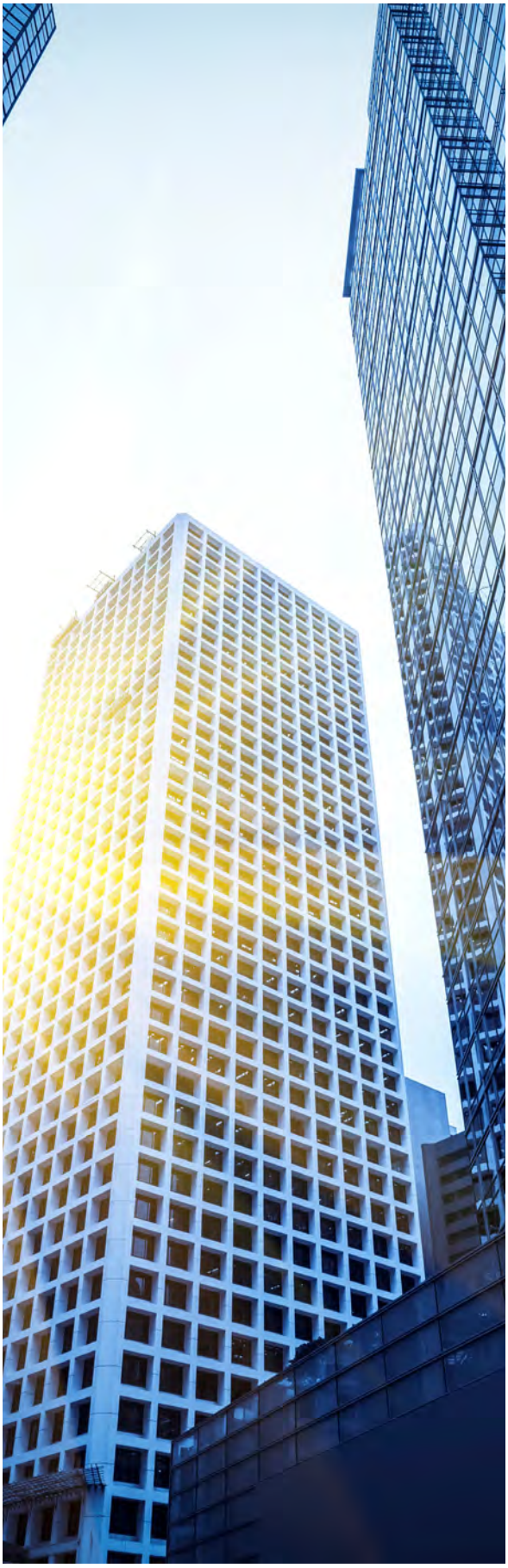
2. **Environmental, Social and Governance (ESG) Factors** 134
3. **Fundamental Analysis** 137
4. **Using Financial Ratios to Assess Investment Potential** 159

This syllabus area will provide approximately 13 of the 80 examination questions



1. Company Accounts

Learning Objective

3.1.1 Know the legal requirements to prepare accounts and the differences between private and public company requirements

1.1 Annual Reports and Accounts

Globally, companies are generally required to prepare financial statements and disclosure key information about the company within an annual report and accounts.

In most countries, company directors have a legal obligation to produce financial statements that reflect the financial health and performance of the company over a specified accounting period. These reports typically include a statement of financial position (or balance sheet; see section 1.2), statement of comprehensive income (or income statement; see section 1.3), and statement of cash flows (or cash flow statement; see section 1.4).

These set out the results of the company's activities during its most recent accounting period and its financial position as at the end of the period. Typically, an accounting period typically spans 12 months although in certain circumstances, the period may be less or longer than this – eg, the company is new or has been wound up.

The size of the company (especially those that are publicly traded) determines the extent of financial reporting requirements, with smaller companies enjoying more exemptions. The size of company is based on specific criteria such as turnover (total income or sales), total assets (the value of everything the company owns) and average number of employees; however, these criteria can vary between countries.

- **Micro companies** – (a sub-classification of small companies) are typically allowed to prepare simplified financial statements with fewer details than other company sizes. They may also be exempt from certain reporting requirements (eg, audits), but they must file their accounts with their members/shareholders and the relevant authorities (eg, Companies House in the UK).
- **Small companies** – are generally exempt from audits of their accounting statements, and do not need to publish an auditor's report. Under certain conditions, they may also be exempt from producing certain additional reports, such as a director's report.
- **Medium-sized companies** – must, in addition to the other information detailed above, also publish a statement of cash flows in their annual report and accounts. They must also provide explanatory notes to the statement of cash flows, and if subject to an audit, they may need to publish an abridged auditors' report (termed a special auditors' report).
- **Large companies** – (ie, those exceeding the criteria for micro, small or medium-sized company classifications) must prepare full financial accounts with detailed disclosures.

If a company qualifies as either a micro, small- or medium-sized company over two successive accounting periods, then it will automatically qualify as such in the following accounting period.

In addition to the above requirements, public limited companies (plcs) with a stock market listing must also incorporate the following within their annual report and accounts:

- A **statement of changes in equity** – this shows:
  - All profits made and losses incurred by the equity holders over the accounting period, whether realised or not.
  - Any dividends paid to the shareholders during the period. Since dividends paid are an appropriation of profit rather than an expense against profit, they are not reflected in the income statement, but are reported here. Accounting standards allow the details to be presented as a 'statement of recognised income and expenses' instead of a full statement of changes in equity.
- An **operating and financial review (OFR)** – this provides a narrative on the company's performance and prospects, consistent with the company's accounts.
- **Additional disclosures** – plcs are often required to disclose whether they have adhered to relevant corporate governance standards and regulations, including any governance codes of practices in their jurisdiction. In the UK, for example, under the FCA's listing rules, companies must disclose whether they have complied with the **UK Corporate Governance Code** in discharging their corporate governance responsibilities.

Many listed companies voluntarily provide additional information about their strategy, business performance and financial management. This is often presented encapsulated in a chairman's statement, a chief executive's review and a finance director's report. In some countries, climate-related financial disclosures are now mandatory for certain types of companies; for others, they remain voluntary or are subject to less stringent reporting requirements.

Listed companies must also publish a half-yearly, or interim, set of reports and accounts. Apart from not being subject to a full independent audit, they do not contain as much information about the company's activities as the annual report and accounts.

1.1.1 Regulatory Framework for Financial Reporting

Financial reports and statements must adhere to established rules, regulations and guidelines regarding their format and content, in order to provide clear, consistent and comparable information to stakeholders including investors, regulators, creditors and other parties interested in the company's financial health. The specific requirements for financial reporting vary by country, but most jurisdictions follow internationally recognised standards or frameworks, such as the International Financial Reporting Standards (IFRS).

In this context, IAS 1 'Presentation of Financial Statements' sets out the overall framework for presenting financial statements, ensuring that they provide transparent and comparable information. Issued by the International Accounting Standards Board (IASB) – which is an independent, privately funded accounting standard-setter based in London – IAS 1 is part of a broader effort to develop high-quality, understandable and enforceable global accounting standards.

In the UK, for example, the legal framework for financial reporting is governed by the Companies Acts, under which directors are legally required to prepare financial statements. The format of these financial statements is defined by standards set by the Financial Reporting Council (FRC), which ensures that the reports reflect the company's activities during its most recent accounting period and its financial position at the end of that period.

Note that in 2024, the IASB introduced a new standard, IFRS 18, which will be effective for annual reporting periods beginning on or after 1 January 2027 (although earlier application is permitted). The new standard seeks to respond to demands from investors for more relevant information and transparency in the presentation of financial statements, as well as greater comparability between statements and more consistency in how particular financial measures are communicated. While IFRS 18 is applicable to all companies across different industries, some companies will notice a significant change, while for others, the impact will be minimal – the extent of the impact will depend on their current presentation practice under IFRS Accounting Standards. The examples of financial statements in the sections below are based on the existing requirements under IFRS, and do not reflect the changes introduced by IFRS 18.

1.1.2 Generally Accepted Accounting Principles (GAAP)

A set of guidelines and rules are used to ensure uniformity and comparability between financial statements prepared by different companies within a country. Commonly referred to as Generally Accepted Accounting Principles (GAAP), this set of guidelines provides the basis for preparing financial statements.

However, over time, different countries developed their own accounting principles. Each country had their own version of GAAP, with slightl nuances on how they treated various accounting matters, thus making international comparisons of companies difficult. It followed that companies wishing to sell shares in multiple countries were required to publish multiple sets of financial statements complying with each set of standards.

Following a push towards standardising accounting rules, most countries around the globe have either adopted IFRS in place of GAAP, or converged their GAAP standards with the IFRS. IFRS differs from GAAP

in that GAAP is a rules-based methodology (and therefore attempts to establish rules and criteria for any contingency), whereas IFRS is principles-based (so it focuses on good reporting and provides guidance on how specific objectives relate to given situations).

The most notable exception is the US, where IFRS has not been adopted yet there are notable differences between IFRS and US GAAP. The US Financial Accounting Standards Board (FASB) has committed to converging with IFRS over time; progress has not been rapid to date, but since 2014 the US Securities and Exchange Commission (SEC) has allowed foreign issuers to prepare financial statements in accordance with IFRS only. IFRS is covered in more detail below.

The UK also had its own GAAP regime, which UK companies with shares traded on a regulated market were required to adopt when preparing their consolidated financial statements. Notably, in 2015, the FRC replaced UK GAAP with five Financial Reporting Standards (FRS), to bring UK accounting standards more in line with the IFRS.

1.2 The Statement of Financial Position (Balance Sheet)

Learning Objective

3.1.2 Understand the purpose and main contents of the statement of financial position: fixed assets; current assets; current liabilities; long-term borrowing; issued share capital; capital reserves; revenue reserves; the concept and implications of off-balance sheet finance

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The statement of financial position provides a snapshot of a company's financial position, as at its accounting year end, by summarising the assets it owns and how these are financed. It is often described as a photograph of the company's financial position in that it does not tell the user anything about the company either immediately before or immediately after its date; rather, it reflects the company's position only at this one point in time.

The purpose of the financial statements is to provide users with relevant and reliable information that helps them to assess the company's financial health, performance and cash flows. These statements offer insights into the company's profitability, liquidity, solvency and overall financial position, thus enabling stakeholders to make informed decisions. The statement of financial position, in particular, helps users understand how a company's assets are financed (whether through debt, equity or a combination of both), and whether it has the resources to meet its obligations.

For a plc, the statement of financial position must be prepared in a prescribed format as set out by relevant regulations – for example, under the Companies Acts in the UK. Although not shown in the example, these requirements include the presentation of comparative figures for the previous year alongside the current year's numbers, as well as the inclusion of a numerical references in the notes column, to support explanatory notes to the various balance sheet items.

An example of the statement of financial position is shown below. Note that '20X1' and '20X2' follow standard accounting conventions, where '20X1' refers to the first year of the period and '20X2' to the subsequent year. This example is a very simple statement for illustrative purposes – in practice, they can be much more detailed (depending on the company's size and financial complexity).

ABC plc Consolidated Balance Sheet			
		As of 31 December	
	Notes	20X2 (£m)	20X1 (£m)
ASSETS			
Current Assets			
Inventories		3,600	
Accounts receivable		2,600	
Investments held for trading		120	
Cash		860	
Total Current Assets		**7,180**	
Non-Current Assets			
Property, plant and equipment		9,200	
Intangible assets		2,100	
Total Non-Current Assets		**11,300**	
Total Assets		**14,550**	
LIABILITIES			
Current Liabilities			
Accounts payable		420	
Commercial paper		980	
Other current liabilities		150	
Total Current Liabilities		**1,550**	
Non-Current Liabilities			
Long-term debt		1,950	
Other non-current liabilities		430	
Total Non-Current Liabilities		**2,380**	
Total Liabilities		**3,930**	
SHAREHOLDERS' EQUITY			
Share capital		2,910	
Retained earnings		11,640	
Total shareholders' equity		**14,550**	

As you can see from the example statement, the construction of the statement of financial position is underpinned by the accounting equation:

Assets = Liabilities + Equity

In this case, 14,550 = 3,930 + 14,550, which demonstrates that the statement of financial position 'balances' (hence, why it is also called a balance sheet).

Other versions of this equation are:

Net assets (ie, total assets less liabilities) = Shareholders' funds

Assets – Liabilities = Share capital + Reserves

Assets = Liabilities + Share capital + Reserves

1.2.1 Assets

An asset is anything that is owned and controlled by the company and confers the right to future economic benefits. Assets are categorised as either current assets or non-current assets.

Current Assets

Current assets are those assets purchased with the intention of resale or conversion into cash in the ordinary course of business, usually within a 12-month period.

They are categorised into the following:

- **Inventory** – goods held available for sale.
- **Accounts receivable** – amounts owed to the company, perhaps as a result of selling goods on credit (often referred to as trade receivables).
- **Investments** – shares held in the short term with the intention of reselling (eg, short-term speculative investments).
- **Cash** – either held physically or by a financial institution, such as a bank; this includes pre-payments.

They are, therefore, known as revenue items and include stocks of goods, the debtor balances that arise from the company providing its customers with credit and any short-term investments held.

Current assets are listed in the statement of financial position in descending order of liquidity and typically appear at the lower of cost or net realisable value (NRV). NRV is defined as the estimated selling price of each stock item, less any further costs required to bring the stock, work in progress or raw materials into a saleable condition. These costs can include costs of production, handling, and any associated selling and marketing expenses. If the NRV of the stock has fallen below cost (due to factors such as obsolescence or market conditions), then the item must be written down to this NRV for statement reporting purposes.

Determining the cost of stock should be relatively straightforward unless the company purchases large quantities of stock in different batches throughout its accounting period. In such cases, identifying individual items or lines of stock becomes particularly challenging when matching sales against purchases. In these situations, the cost can be determined by assuming a certain flow of inventory through the business. Companies can account for their stock in one of three ways:

- **First in first out (FIFO)** – FIFO assumes that the first stock purchased by the business is the first to be sold. Therefore, the value of the closing stock at the end of the accounting period is based on the cost of the most recent purchases. This method produces a closing stock figure in the statement of financial position that is closer to the stock's current market value. Additionally, during periods of rising prices, FIFO also results in the highest reported profit figure of the three methods.
- **Last in first out (LIFO)** – LIFO assumes that the most recent stock purchased by the company is the first to be sold. However, IAS 2 does not permit the use of LIFO as it can distort the financial picture (especially in times of rising prices) by valuing closing stock at the cost of the oldest inventory, which no longer reflects current market prices. LIFO also resulted in the lowest reported profit figure among the three methods.
- **Weighted average cost (AVCO)** – AVCO values closing stock based on the weighted average cost of all stock purchased during the accounting period. This method produces a closing stock figure and a reported profit that fall between those reported under FIFO and LIFO.

Non-Current Assets

Non-current assets represent resources that are held for long-term use within a business. There are two types of non-current assets:

- **Fixed assets** – which are held for sale, and
- **Long-lived assets** – which are used by the business to generate revenue on a continuing business (rather than being purchased for immediate resale).

Fixed assets can be further categorised as either tangible or intangible assets, or investments.

- **Tangible assets** – are non-current assets that have physical substance, such as land and buildings (freehold and leasehold), plant and machinery, motor vehicles, and fixtures and fittings. These assets are commonly referred to as 'property, plant and equipment' (PPE).

  Property, plant and equipment are physical assets that are used within the business over a number of years with a view to deriving some benefit from their use (eg, through their use in the manufacture of goods for resale).

  In accordance with IAS 16, PPE and the historic cost convention, tangible fixed assets are initially recorded in the statement of financial position at their actual cost. This cost includes delivery costs, installation expenses, and other costs related to financing the acquisition of the asset. Since these costs are capitalised (rather than expenses in the statement of comprehensive income), they are added to the statement of financial position as part of the asset's value.

  IAS 16 allows a choice of accounting:

  - Under the cost model, the asset continues to be carried at its original cost.
  - Under the revaluation model, the asset may be revalued periodically to reflect its current fair value, with revaluation adjustments made at regular intervals.

- **Intangible assets** – are non-current assets that, although without physical substance, can be separately identified and are capable of being realised. These assets often represent the company's intellectual property rights, which enable it to operate and generate profits in a way that competitors cannot easily replicate.

  The types of intangible assets that commonly appear on the statement of financial position include development expenditure, patents, licences, trademarks, publishing rights and titles, goodwill, and brands.

  Ownership of an intangible fixed asset confers certain rights, which provide the company with a competitive advantage. These rights include exclusive ownership of brand names, patents, trademarks and purchased goodwill, thus allowing the company to differentiate itself from its peers and retain economic benefits over time.

- **Investments** – fixed asset investments are typically long-term investments held in other companies. They are initially recorded in the statement of financial position at cost, and are subsequently revalued to their fair value at the end of each accounting period. Any gains or losses are reflected directly in the equity section of the statement of financial position and disclosed in the statement of changes in equity. However, if these investments suffer an impairment in value, then the loss is charged to the statement of comprehensive income.

  If the shareholding represents at least 20% of the issued share capital of the company in which the investment is held, or if the investing company exercises significant influence over the management policies of the other, then additional reporting requirements apply to the investing company.

1.2.2 Liabilities

There are three broad categories of liabilities:

- **Creditors or payables** – these are known amounts the company owes (eg, invoices received and bank overdrafts).
- **Accruals** – these are liabilities for which the timing of payment is generally known, but the amount to be paid is uncertain. Accruals normally arise from routine transactions of the business, either of an operating or financing nature.
- **Provisions** – a provision represents either an amount to account for the reduction in the value of an asset (eg, **depreciation**) or an estimate of a known but not exactly quantified liability arising from something outside of the normal trading activities of a company.

Liabilities are categorised based on when they are due:

- current liabilities are due within one year, and
- non-current liabilities are due after more than one year.

Current Liabilities

This balance includes the amount that the company owes to its suppliers (trade creditors) for goods and services purchased on credit (known as trade payables), any bank overdrafts, and any dividends or taxes payable within 12 months of the date of the statement of financial position.

Non-Current Liabilities (or Long-Term Liabilities)

This comprises the company's borrowing that is not due for not repayment within the next 12 months. It typically includes long-term bank loans, **debentures** and **loan stock** issued by the company, and trade payables that are not due for settlement within the year.

A proposed dividend is not recognised as a liability in the statement of financial statement at the year-end, although it will be disclosed within the report and accounts. IAS 10 requires that proposed dividends are treated as non-adjusting events arising after the statement date; they are not considered to be liabilities until declared by a resolution approved by shareholders at a general meeting.

1.2.3 Shareholders' Equity

The bottom half of the statement of financial position typically reflects the company's equity or shareholders' funds, which represent the ownership interest in the company. This section shows the residual value of assets after all liabilities have been deducted, and includes various items that contribute to the company's net worth.

The items shown under equity or shareholders' funds can include share capital, capital reserve, and retained earnings, among other items.

Authorised and Issued Share Capital

When a company is created, the memorandum of association must specify the amount of share capital with which the company is to be registered, along with the division of that capital into shares of a fixed amount. This amount is known as the authorised share capital, which acts as a ceiling on the number of shares that can be issued. The issued share capital refers to the actual number of shares that have been issued to shareholders. However, the authorised share capital can be increased through the passing of an ordinary resolution at a company meeting.

Globally, some countries require a company to specify an authorised share capital, while others allow more flexibility in the issuance of shares. For example, in the UK under the Companies Act 2006, companies are not required to have an authorised share capital; instead directors can be authorised by the company's articles or by a resolution to allot shares up to a maximum amount and for a limited period.

Capital Reserves

Capital reserves include the revaluation reserve, share premium reserve and capital redemption reserve.

- The revaluation reserve arises from the upward revaluation of tangible and intangible fixed assets.
- The share premium reserve arises from issuing shares at a price above their nominal value.
- The capital redemption reserve is created when a company redeems or buys back its shares and transfers an equal to the nominal value of the shares redeemed from its revenue reserves to its capital reserves.

Capital reserves are not distributable to the company's shareholders as they represent unrealised profits and form part of the company's capital base. However, they can be converted into a **bonus issue** of ordinary shares.

Companies can issue shares at greater than their nominal value (ie, at a premium). For example, a company might raise £100 million by issuing new £1 ordinary shares at a price of £2.50 each. The premium is the difference between the nominal value of the ordinary shares and the price they are issued at, which in this case is £1.50.

Under the Companies Act, the company must record the issue of these shares by increasing the **ordinary share capital** by only the nominal value of the shares issued (£100 million in this case). The premium of £150 million must be added to the share premium account.

Revenue Reserves and Retained Earnings

A revenue reserve refers to profits that a company has retained from its operations and that are available for distribution to shareholders as dividends or for reinvestment in the business. Unlike capital reserves (which arise from non-operational sources such as revaluation or share premiums), revenue reserves come from the company's normal trading activities.

Retained earnings are the most common example of a revenue reserve. They represent a company's distributable profits that have accumulated over time, but have not been distributed to the company's shareholders as dividends, or transferred to capital reserves; instead, they have been retained in the business.

You should not confuse this balance with the amount of cash that the company holds or with the profit shown in the statement of comprehensive income for a single accounting period, which reflects the undistributed profit for that period.

1.2.4 Off-Balance Sheet Finance

Off-balance sheet finance is a type of accounting practice that allows firms to keep their debt-to-equity and leverage ratios low, thereby potentially reducing the cost of borrowing.

Like other companies, financial institutions issue bonds to raise capital and finance borrowing. However, they can also arrange borrowing for themselves or others by creating **special purpose vehicles (SPVs)**, which allow money to be raised without appearing on the statement of financial position of the issuing entity. This type of finance is referred to as 'off-balance sheet finance' because the associated liabilities or assets does not appear in the statement of financial position.

1.3 The Statement of Comprehensive Income (Income Statement)

Learning Objective

3.1.3 Understand the purpose and main contents of the statement of comprehensive income: revenue; cost of sales; depreciation charge; interest income/expenditure; investment income; taxation; profit; extraordinary items and exceptional items; other comprehensive income

The statement of comprehensive income (also called the income statement) summarises the company's revenue transactions over the accounting period to produce a profit or loss. As a result, this statement is often referred to as the profit and loss account. However, being constructed on an accruals (rather than a cash) basis, profit must not be confused with the company's cash position.

The two specific functions of the statement of comprehensive income statement are to:

- detail how the company's reported profit was arrived at, and
- state how much profit has been earned and how it has been distributed. The amount of profit earned over the accounting period will impact the company's ability to pay dividends and finance the business's growth from internal resources.

Like the statement of financial position, the income statement format is governed by regulatory frameworks (eg, the Companies Acts in the UK) and its construction underpinned by accounting standards.

An example statement of comprehensive income for ABC plc is shown below. As with the statement of financial position (see section 1.2), comparative numbers and explanatory notes must be provided.

ABC plc			
Income Statement			
		As of 31 December	
	Notes	**20X2 (£'000)**	**20X1 (£'000)**
Continuing Operations			
Revenue		9,500	
Cost of sales		(7,000)	
Gross Profit		2,500	
Distribution costs		(110)	
Administrative expenses		(30)	
Other income		–	
Operating Profit		2,360	
Exceptional loss		(260)	
		2,100	
Income from fixed asset investments		30	
Interest receivable		90	
Interest payable		(230)	
Profit before Taxation		1,990	
Taxation		(555)	
Net Income		1,435	
Earnings per share (pence)		14.3p	

The net income is then taken to the statement of changes in equity for the year and shown as retained earnings on the statement of financial position.

Earnings per share (EPS) is the amount of a company's profits allocated to each outstanding ordinary share. It is calculated by dividing the net income (ie, profit after tax and the deduction of preferred dividends) by the total number of ordinary shares in issue:

$$\text{EPS} = \text{Profit attributable to ordinary shareholders} / \text{Number of ordinary shares in issue}$$

In this example, there are 1 million shares in issue, hence EPS = £1,435,000 / 1 million = £1.435or 143.5p. EPS is covered in more detail in section 3.5.1 of this chapter.

Some of the main contents of the statement of comprehensive income and their purposes are as follows:

- **Revenue** – the income generated in the reporting period by selling goods or providing services during the normal course of operations. Companies need to generate revenues (also called gross sales) to earn a profit and stay viable in the long run. Revenue features at the top of the statement of comprehensive income, so it is often referred to as the 'top line'.
- **Cost of sales** – the costs directly incurred to produce the goods or services sold, such as raw materials, labour and storage costs. Also known as cost of goods sold (COGS) or cost of revenue, this measures the company's ability to produce goods and provide services at a reasonable cost.
- **Depreciation charge** – an amount by which tangible non-current assets decline in value, over the asset's useful economic life (ie, the expected period of time during which an asset is useful to the average business). Without a depreciation charge, a company would incur the entire cost of an asset in the year of purchase, which could negatively impact profitability. The depreciation charge does not apply to freehold land and non-current asset investments, since their economic life is not limited.
- **Amortisation charge** – similar to a depreciation charge, but it is applied to intangible non-current assets with a finite useful life.
- **Interest income/expenditure** – interest income is the amount earned by a company for lending funds (eg, by depositing them in a bank account), while interest expenditure is the company's cost on borrowings. The higher the interest expenditure, the more the company is paying to its debtors, which can impact profitability.
- **Investment income** – income earned from holding investments (eg, stocks and shares, and real estate), including interest payments and dividends, as well as capital gains on the sale of those investments.
- **Taxation** – the total tax that the company has paid on its profits during the period.
- **Profit** – the amount of money that the company has earned, after deducting all allowance business expenses. It is at the bottom of the statement of comprehensive income, hence is often referred to as the 'bottom line'. To survive in the long run, businesses must be profitable, so measuring current and past (as well as future) profitability – is very important.
- **Extraordinary and exceptional items** – gains, losses and other items that are unusual and infrequent. An item is deemed to be extraordinary or exceptional if they do not form part of the company's day-to-day operations but they have a material impact on the company. These items are disclosed separately so that the impact on profit or loss can be perceived.
- **Other comprehensive income** – revenues, expenses, gains and losses that have yet to be realised; for example, a portfolio of bonds that are yet to mature.

1.4 The Statement of Cash Flows (Cash Flow Statement)

Learning Objective

3.1.4 Know the purpose and main contents of the statement of cash flows: operating activities; investing activities; financing activities

The statement of cash flows (also called the cash flow statement) seeks to identify how a company's cash has been generated over the accounting period and how it has been expended.

Not all items on the statement of comprehensive income result in an immediate cash flow or any cash flow. For example:

- **Depreciation** – a cash flow occurs when the asset is purchased and when it is sold, but not when it is depreciated.
- **Accrued expenses/purchases on credit** – cash flows related to these items occur when payment is made, which is after they have been recognised as expenses in the statement of comprehensive income.
- **Sales on credit/prepaid expenses** – cash flows occur when these debts are settled which, again may differ from when the revenue or expense is recognised in the statement of comprehensive income .

Since cash is critical to a company's ability to continue its operations we must have a statement showing how the company's financial resources have been generated and used. This helps to highlight the company's liquidity position and cash flow trends.

The statement of cash flows is constructed by:

- **Removing accruals** – (eg, amounts payable and receivable) from the statement of comprehensive income, so that these items can be accounted for on a cash basis (ie, when cash is actually paid or received).
- **Adjusting for items on the statement of financial statement** – eg, an increase in the value a company's stock (inventory) or debtors (accounts receivable), or a decrease in creditors (accounts payable). While these changes affect reported profit, they do not impact cash.
- **Adding back non-cash items** – eg, depreciation, **amortisation** and book losses from the sale of fixed assets. Similarly, book profits from fixed asset disposals are deducted, as they impact recorded profit but not the company's actual cash flow.
- **Including changes in items on the statement of financial position** – that impact the company's cash position – eg, such as finance raised and repaid over the accounting period and fixed assets bought and sold.

As not all of the effects of accruals accounting can be stripped out from a company's operating profit, the statement of cash flows can be considered somewhat of a misnomer in that it contains a mixture of accruals, cash, credit and fund flows.

An analysis of the statement of cash flows shows the importance of generating positive cash flow at the operating level. Without this, a company may become reliant upon fixed asset sales and borrowing to finance its day-to-day operations.

A company's survival and future prosperity depend on replacing its fixed assets to remain competitive. However, these assets must be financed with capital of a similar duration that matches the asset's economic life and payback pattern (eg, if the asset's useful life is ten years, then financing should ideally be for at least ten years). Otherwise, the company may have insufficient funds to finance its operating activities. The statement of cash flows can highlight this risk.

The statement of cash flows for ABC plc, based on the IAS 7 format, is given next. Although not shown, explanatory notes and comparative figures are also required.

ABC plc			
Consolidated Cash Flow Statement			
		As of 31 December	
	Notes	20X2 (£m)	20X1 (£m)
Operating Activities			
Cash receipts from customers		4,528	
Cash paid to suppliers and employees		(2,001)	
Cash generated from operations		2,527	
Tax paid		(440)	
Interest paid		(150)	
Net Cash from Operating Activities		4,464	
Investing Activities			
Interest received		80	
Dividends received		40	
Purchase of fixed assets		(1,890)	
Proceeds on sale of investments		120	
Net Cash Used from Investing Activities		(1,650)	
Financing Activities			
Dividends paid		(435)	
Repayments of borrowings		(200)	
Proceeds on issue of shares		650	
Net Cash from Financing Activities		**15**	
Net increase in cash and cash equivalents		2,829	
Cash and cash equivalents at the beginning of the year		425	
Cash and Cash Equivalents at the End of the Year		3,254	

As you can see from the statement, cash flows are broken down into the following categories:

- **Operating activities** – these are the main revenue-generating activities of the company that are not related to investing or financing. Operating cash flows include cash received from customers, and cash paid to suppliers and employees.
- **Investing activities** – these involve the acquisition and disposal of long-term assets and other investments.
- **Financing activities** – these activities alter the equity capital and borrowing structure. This includes dividends paid, repayments of borrowings and proceeds from issuing shares.

- **Cash and cash equivalents** – this shows the overall movements in cash and cash equivalents during the period. It consists of cash in hand and demand deposits, as well as short-term, highly liquid investments that are readily convertible to a known amount of cash and are subject to minimal risk of changes in value.

1.5 Consolidated Company Report and Accounts

Learning Objective

3.1.5 Understand the basic principles of accounting for: associated companies; subsidiaries; minority interests

1.5.1 Investments

A company may hold voting shares in another company, which gives it certain rights and potential influence over the other company's operations. The extent of influence exerted depends on the size of the shareholding.

Depending on the percentage of shares owned, as well as the level of control or influence that the company can exercise, then the investment must be reported in the financial statements according to specific accounting rules. Proper reporting ensures that the company provides a clear view of its overall financial health to its stakeholders.

In general, a shareholding of 20% is considered to be the threshold for significant influence. If company A has less than a 20% holding in the voting share capital of company B and does not exercise any significant influence over the operating policies of company B, then this investment is recognised in company A's statement of financial position as either:

- a fixed asset investment at cost, less any impairment to its value, or
- a current asset at the lower of cost or NRV (in this instance, NRV is the current market value).

In both cases, any dividends received will be taken to the statement of comprehensive income in arriving at profit on ordinary activities before taxation.

However, if this shareholding represents at least 20% of company B's voting capital or company A is in a position to exert considerable influence over company B's management, then company A is required to show the position of the combined entity in its statements of financial position and comprehensive income.

1.5.2 Subsidiaries

When a company controls another company, the controlling company is referred to as the parent company and the controlled company as the subsidiary.

Control is most commonly achieved through the parent company's ownership of shares in the subsidiary. These shares provide the parent with the necessary voting power to influence or determine the composition of the subsidiary's board and, consequently, to exercise control. This leads to the general presumption that owning more than 50% of the shares is enough to establish control and create a subsidiary.

A subsidiary may itself have its own subsidiaries; and these, in turn, may have subsidiaries of their own – thus forming a chain of ownership. The parent company and all its subsidiaries together are called a group of companies.

1.5.3 Group Accounts

To account for its control, a parent company is required to present group accounts (also termed consolidated accounts or consolidated financial statements) that amalgamate the assets and liabilities of the parent with those of its subsidiary companies. By combining the assets and liabilities, the parent company's shareholders can clearly see all the resources controlled by the group, as well as the liabilities that the group owes to others.

Most listed companies are parent companies that control one or more subsidiary companies. As a result, listed companies present consolidated financial statements to their shareholders.

As stated in section 1.5.2, a subsidiary is established when the parent company controls more than 50%. When the parent owns 50%, and 100% of the subsidiary's shares, then the remaining shares are held by parties other than the parent, and are referred to as minority interests.

The portion of the net income that the minority shareholders own is shown as a deduction at the bottom of the consolidated statement of comprehensive income. A similar adjustment is made in the consolidated statement of financial position, where minority interests are presented as a separate entry within equity.

1.5.4 The Equity Method of Accounting

IAS 28 'Investments in Associates' prescribes the accounting treatment for investments in other companies where the investor has a 20% to 50% shareholding, or exercises a significant influence over the management of the other company.

The company in which the shareholding is held is known as an associate company and the method employed to account for the investment is termed the equity method of accounting.

Under the equity method of accounting, if company A has a 30% shareholding in B, for instance, then:

- 30% of company B's post-acquisition operating profit, interest income, interest expenses and tax are included in company A's consolidated statement of comprehensive income. However, any dividends received by company A from company B do not enter the consolidated statement of comprehensive income. Company B's post-acquisition profits refer to those generated after A has acquired a stake in B, making B an associated company.
- 30% of the value of company B's net assets, along with the value of any purchased goodwill arising from the investment, will be reflected in the consolidated statement of financial position.

2. Environmental, Social and Governance (ESG) Factors

Learning Objective

3.2.1 Know: ESG disclosure mechanisms; the concept of materiality assessments including Sustainability Accounting Standards Board (SASB) Materiality Map; regulatory guidelines on marketing

Environmental, social and governance (ESG) refers to a set of criteria used to evaluate a company's operations and performance in areas that impact society and the planet.

Environmental, social and governance (ESG) investing is an investment strategy focusing on companies that are addressing (or developing ways to address) at least one of the below three key dimensions, alongside traditional financial metrics:

- **Environmental** relates to environmental conservation and sustainability – eg, climate change, the use of pesticides and biodiversity.
- **Social issues** look at a company's relationships with its stakeholders and risks throughout their supply chains – eg, human rights, equal opportunities and working conditions.
- **Governance** refers to the way in which businesses are directed and controlled – eg, board structures and practices, and directors' remuneration.

To achieve these goals, ESG investors broadly wish to allocate resources to areas they feel deserve investment and to support companies that benefit the community (positive screening), or those with products, services and/or business practices that contribute to sustainable development, while trying to avoid those with poor sustainability profiles (negative screening). What constitutes a 'good' or 'bad' company can vary widely between individuals, depending on their values and morals, so there is no set and accepted definition of ESG in the financial services sector, thus leaving it open to interpretation.

Note that there is vast terminology in this field, with terms such as 'ethical', 'green' and 'sustainable' often used interchangeably by financial professionals and investors alike. In practice, each are strategies in their own right, and there are distinct differences between them. For example, 'green investing' focuses specifically on environmental sustainability, while 'ethical investing' typically excludes the sin stocks (ie, those involved in tobacco, alcohol, gambling, adult entertainment and weapons manufacture), although the scope of what is considered to be unethical has expanded over the years.

2.1 Climate Change

Climate change is almost certainly the world's biggest challenge, and the greatest threat to humanity today. Unsustainable human activities have generated threats to the global environment, including climate change (associated with rising sea levels, extreme weather and flooding), resulting in destruction of ecosystems, loss of life, and disruption to food and fresh water supplies.

Companies are under growing pressure from governments, consumers and investors to address climate change. However, companies often incorrectly view the implications of climate change to be relevant

only in the long term; they do not necessarily see it as relevant to make decisions regarding climate change today.

To raise awareness of climate change impacts, and to improve and increase reporting of companies' climate-related financial information, several reporting mechanisms have been established.

The Task Force on Climate-Related Financial Disclosures (TCFD), Global Reporting Initiative (GRI) and Sustainability Accounting Standards Board (SASB) are among the key organisations that set frameworks and standards for sustainability disclosure.

2.1.1 Task Force on Climate-Related Financial Disclosures (TCFD)

The Task Force on Climate-related Financial Disclosures (TCFD) was established in 2015 by the Financial Stability Board (FSB). The TCFD developed recommendations aimed at providing consistent climate-related financial risk disclosures for use by companies in providing information to investors, lenders and other stakeholders. While TCFD recommendations were voluntary, some countries and regions (eg, the UK, the EU, Japan and South Africa) added TCFD-aligned requirements into law or require full compliance with disclosure laws related to TCFD guidelines, therefore making climate reporting mandatory. Concurrent with the release of its 2023 status report, the TCFD has fulfilled its remit and disbanded; and the IFRS Foundation has taken over monitoring of companies' progress relating to their climate-related disclosures.

2.1.2 Global Reporting Initiative (GRI)

The Global Reporting Initiative (GRI) is an independent, international organisation formed in 1997 by the US-based non-profits Ceres and the Tellus Institute, with the support of the United Nations Environment Programme (UNEP). Based in the Netherlands, with regional offices around the world, it provides best practice for impact reporting.

The most recent of the GRI's reporting frameworks are the GRI Standards. Developed by the Global Sustainability Standards Board (GSSB) and launched in 2016, the GRI Standards are reporting guidelines that cover a range of topics including biodiversity, waste, emissions and tax. They help businesses, governments and other organisations understand and communicate their impact.

The GRI Standards are the most widely adopted: over 100 countries and over 10,000 companies worldwide publish a GRI.

2.1.3 Sustainability Accounting Standards Board (SASB)

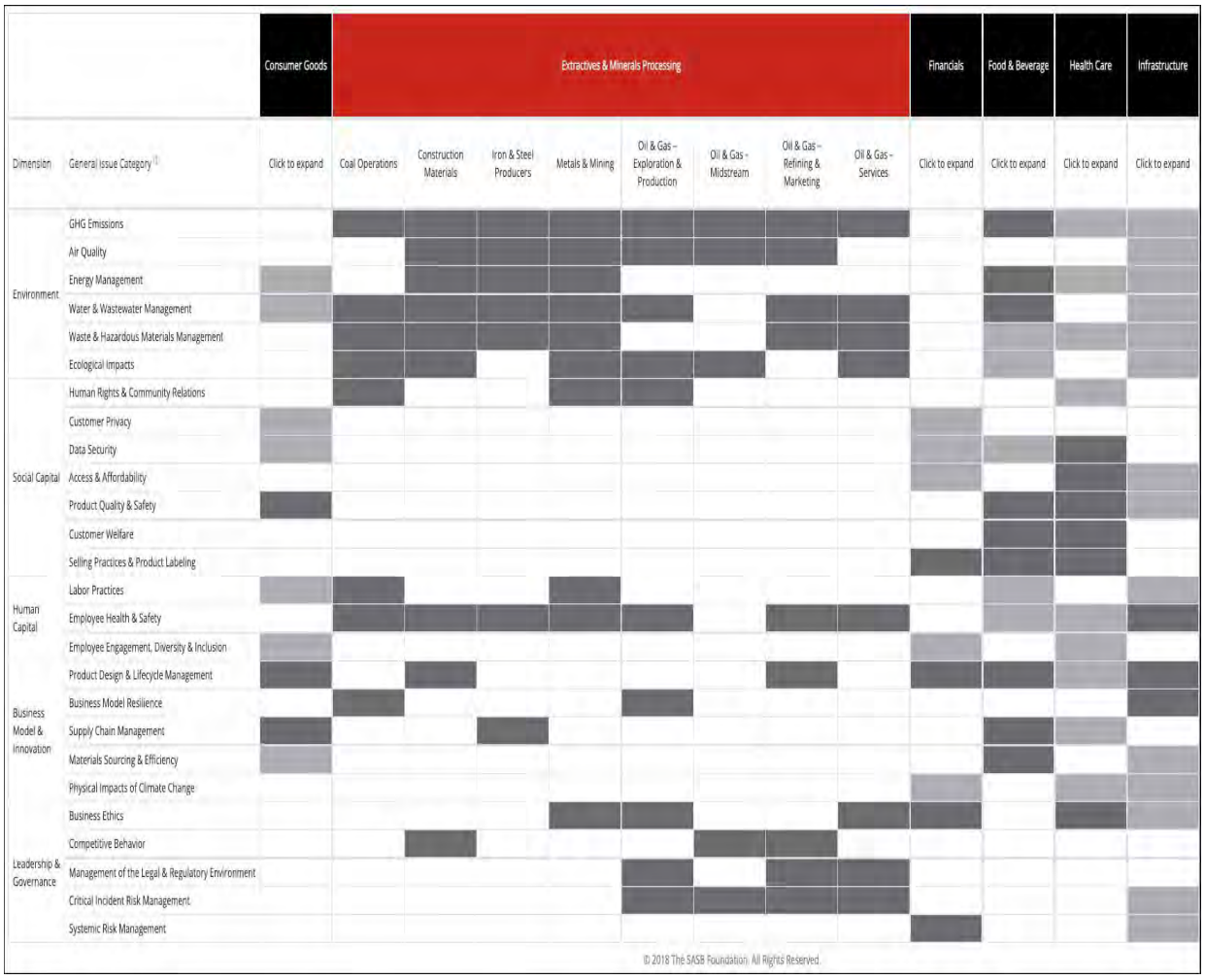
The Sustainability Accounting Standards Board (SASB) is a non-profit organisation aiming to develop accounting standards that global companies may use when reporting on ESG issues.

The SASB Standards are industry-specific standards, on the basis that ESG issues that are most likely to impact financial performance will vary from one industry to another; thus, by focusing on the most relevant ESG information, this can reduce costs to the business. The SASB identify ESG issues that are most relevant to the financial performance in almost 80 industries, since an issue that affects one sector does not necessarily affect another equally. For example, in terms of the environment, greenhouse gas

emissions are a key issue in the oil and gas industries, water management in agriculture, and energy consumption in industrials; a similar distinction applies to societal and governance issues. The SASB has developed these standards based on extensive feedback from companies, investors and other market participants.

The SASB created its Materiality Finder to enable users to quickly find and compare the SASB Standards that are financially material to various organisations; access to the SASB Standards and Materiality Finder is free to everyone. Organisations may also obtain access, via a login, to the Materiality Map, which visually reveals how sustainability issues manifest across various industries.

A screenshot of the Materiality Map is shown below. The headings at the top show each industry (eg, Consumer Goods, Extractives & Minerals Processing), and ESG issues are listed down the side (eg, GHG Emissions, or Air Quality). The dark grey coding indicates that the issue is likely to be material for more than 50% of the industries in the sector, and light grey less than 50%. For example, within Financials, some of the key ESG issues are: Business Ethics and Systemic Risk Management (dark grey) and Customer Privacy, Data Security and Physical Impacts of Climate Change (light grey),



Source: SASB

2.3 Regulatory Guidelines on Marketing

In recent years and months, demand for ESG-focused investments has grown, driven by increased consumer awareness and heightened environmental concerns. In response, governments and regulatory bodies worldwide have imposed various rules and regulations aimed at ensuring the accuracy and transparency of marketing materials and claims related to ESG investments. In doing so, these rules and regulations help to ensure that companies and portfolio/fund managers are clear and honest about the sustainability and impact of their offerings, and therefore protect consumers against 'greenwashing' – in other words, the practice of companies making misleading environmental claims for marketing purposes without following through on their pledges, ultimately to increase profits.

Some examples of these rules and regulations are as follows:

- **Sustainable Finance Disclosure Regulation (SFDR)** – introduced in 2019, the SFDR is a piece of EU legislation that requires financial services professionals to provide prescriptive and standardised disclosures on how they integrate ESG factors at the organisation and product level. Any firm not complying must publish a statement to explain why ('comply or explain'). Many other territories are planning their own versions of this legislation; while the rules will differ in detail for each, they will likely be very much the same overall.
- **Sustainability Disclosure Requirements (SDR)** – the UK's version of the EU's SFDR. It requires investment products within its scope (ie, those that are marketed to retail investors in the UK, and that use certain sustainability-related terms in their product name and marketing materials) to display a label reflecting their sustainability characteristics. If a product does not meet the qualifying criteria, then it will not be able to use these labels, nor use one of these terms in its product name or marketing materials. The SDR also introduced an anti-greenwashing rule, which requires all regulated firms to ensure that their sustainability-related claims in all marketing materials and communications are clear, fair and not misleading.
- **Climate Disclosure Rule** – in the US, the final rules require firms with 'material' greenhouse gas emissions to make disclosures relating to their climate-related risks and risk management, as well as the board and management's governance of those risks. The rules aim to enhance and standardise climate-related disclosures for investors.
- **Other government initiatives** have been implemented to support the development of sustainable finance. In 2021, for example, the Monetary Authority of Singapore (MAS) enhanced climate-related financial disclosures for banks and asset managers as part of its Green Finance Action Plan.

3. Fundamental Analysis

As we saw in section 2.3 of chapter 1, fundamental and technical analysis are the two main methodologies used for investment analysis. Fundamental analysis involves evaluating a company's financial health and overall business environment, which includes assessing its capital structure, profitability, liquidity and value creation. Several key components of this analysis provide insight into a company's cost of financing and help to determine its overall financial efficiency, and others in assessing the company's operational performance and risk profile.

In this section, we will explore various metrics associated with fundamental analysis.

3.1 Weighted Average Cost of Capital (WACC)

Learning Objective

3.3.1 Be able to analyse financial data to determine the capital structure of a business: weighted average cost of capital (WACC)

In order to provide goods and services, companies need to be financed; for example, by raising money through listing their shares on the stock exchange (equities) or by issuing interest-paying bonds (debt). This all comes at a cost, and the associated cost will vary depending on the source.

Weighted average cost of capital (WACC) reflects the combined cost of equity and debt, with the weights of each based on their market value:

$$\frac{\text{WACC} = (\text{E} \times \text{R}_e) + (\text{D} \times \text{R}_\text{d} \times (1 - \text{T}_\text{c}))}{\text{E} + \text{D}}$$

where:

E = market value of the firm's equity
D = market value of the firm's debt
R_e = cost of equity
R_d = cost of debt
T_c = corporation tax rate

WACC provides a clear hurdle rate for internal projects or potential acquisitions. It is, therefore, an important parameter in assessing a firm's potential for net profitability, so investors and analysts use it to assess the returns on investment in a company. Analysts also use it to compare capital structures; for example, by tracking the ratio of equity and debt, and comparing that ratio against the company's industry peers.

While it may be considered that equity capital has no concrete cost once the shares have been listed on the stock exchange, this is a common misconception. From the company's perspective, shareholders' expected rate of return is considered to be a cost of equity – this is because shareholders will simply sell their shares if the company does not deliver this expected return, leading to a fall in the share price and the company's overall valuation. Thus, the cost of equity is typically higher than the cost of debt.

From this, if too much equity is being used, this could mean the company is paying too much for its cost of capital. On the other hand, if too much debt is being used, this could be seen as a credit risk (eg, if interest rates go up, the company may become unable to finance its debts).

No single debt-to-equity ratio can be applied to achieve an optimal capital structure. Firms in different industries will use different capital structures, depending on their type of business. For example, capital-intensive industries such as car manufacturers often rely heavily on debt, while service-oriented and labour-intensive firms such as software companies tend to use more equity. Additionally, a company's capital structure can change over time, influenced by internal factors (eg, its stage of development) and external conditions (eg, changes in interest rates).

3.2 Yields and Ratios

The financial statements and associated explanatory notes issued by a company contain significant data that needs to be turned into meaningful numbers. These numbers can then be used for assessing the profitability of a company, the risks attached to those earnings, the company's ability to meet its liabilities as they fall due, and to identify trends.

Thus, we now turn to look at the range of yields and ratios that can be used as part of fundamental analysis.

These ratios can be grouped under four headings.

- **Profitability** – measures to assess the trading or operating performance of the company (ie, levels of trading profits generated and the effectiveness of the use of trading assets).
- **Liquidity** – measures to assess the trading risk of the company. This is the risk that, as a result of trading activities, the company may be unable to pay its suppliers, as debts fall due and cease to exist.
- **Investors' ratios** – measures to assess the returns to providers of finance, who may be either shareholders or lenders.
- **Gearing** – measures to assess the risks to providers of finance, due to the company's level of borrowing.

3.3 Profitability Ratios

Learning Objective

3.3.2 Be able to analyse financial data using the following profitability ratios: return on capital employed (ROCE); asset turnover

Profitability ratios provide information about management's performance in using the business's resources. These ratios are used to assess the effectiveness of a company's management in employing the company's assets to generate profit and shareholder value.

3.3.1 Return on Capital Employed (ROCE)

ROCE is a key measure of a company's profitability, showing the returns that have been generated from the total capital employed (which includes both debt and equity) in a company. It provides an indication of how efficiently a company is using its capital to generate profit.

It expresses the income generated by the company's activities (ie, its profit before interest and tax) as a percentage of its total capital employed:

$$\text{ROCE (\%)} = \frac{\text{Profit before interest and tax}}{\text{Capital employed}}$$

This result can then be used to compare the returns generated to the cost of borrowing, establish trends across accounting periods and make comparisons with other companies. A higher ROCE typically signals better capital efficiency, while a lower ROCE may indicate that the company is not utilising its capital as effectively as its competitors.

Capital Employed

This profit figure can be viewed as operating profit plus interest receivable and income from other investments (ie, the profits management has generated from the available resources). It is specifically before interest payable, since interest costs will depend on the company's financing; the larger the loans, the larger the interest payable.

$$\text{Capital employed} = \text{Total assets} - \text{Current liabilities} + \text{Short-term borrowing}$$

In this calculation, current liabilities excludes borrowings such as overdrafts and finance lease obligations, since these are considered part of the company's short-term borrowings which are accounted for separately.

Alternatively, capital employed can be calculated from the financing side of the statement of financial position as:

$$\text{Capital employed} = \text{Shareholders' funds} + \text{Non-current liabilities} + \text{Borrowings in current liabilities}$$

This can then be substituted into the formula for ROCE, above.

It should be noted that the result for capital employed can be distorted in the following circumstances:

- The raising of new finance at the end of the accounting period, as this will increase the capital employed but will not affect the profit figure used in the equation.
- The revaluation of fixed assets during the accounting period, as this will increase the amount of capital employed while also reducing the reported profit by increasing the depreciation charge.
- The acquisition of a subsidiary at the end of the accounting period, as the capital employed will increase but there will not be any post-acquisition profits from the subsidiary to bring into the consolidated statement of comprehensive income.

3.3.2 Asset Turnover

Having established the ROCE, we now need to consider what may have caused any change from one year to the next. This is caused by one of two factors.

- Changes in profit margin.
- Changes in turnover volumes.

This can be undertaken by breaking ROCE down further into two secondary ratios: asset turnover and profit margin.

Asset turnover looks at the relationship between sales and the capital employed in a business. It assesses how efficiently a company is generating sales relative to its assets over the accounting period.

The formula for calculating asset turnover is:

$$\text{Asset turnover (x)} = \frac{\text{Sales}}{\text{Capital employed}}$$

A higher asset turnover generally indicates that a company is using its assets more efficiently to generate sales, suggesting good management of resources and capital efficiency. However, it is important to note that asset turnover can vary significantly between industries – for example, businesses in asset-light industries such as retailers may naturally have a higher asset turnover, while capital-intensive industries such as infrastructure (where investment in fixed assets is typically higher) may reduce asset turnover.

3.3.3 Gross, Operating and Net Profit Margins

Learning Objective

3.3.3 Be able to analyse financial data to determine: net profit margin; gross profit margin; equity multiplier; economic value added (EVA)

Profit margin is a measure that assesses a company's ability to generate profit from its sales revenue. It is derived from the statement of comprehensive income, and can be used to analyse the profitability of a company in order to determine if it is operating efficiently and generating sufficient returns.

The higher the profit margin, the better, as it indicates that a company is retaining more profit per unit of sales. That said, high or improving profit margins may attract other firms into the industry (depending on barriers to entry), potentially driving down margins in the long run.

There are three main types of profit margin: gross profit margin, operating profit margin and net profit margin.

Gross Profit Margin

The gross profit margin measures a company's profit after paying for the cost of goods sold (COGS). It shows how efficiently the management uses its labour, raw materials and other direct costs in the production process.

The formula for calculating profit margin is:

$$\text{Gross profit margin}(\%) = \frac{\text{Gross profit}}{\text{Revenue}}$$

Firms with a high gross profit margin are typically more liquid and have more cash flow available to spend on research and development, marketing and investment.

Operating Profit Margin

The operating profit margin shows how efficiently management uses business operations to generate profit; hence this measure accounts for both direct and indirect costs.

Operating profit margin is calculated using the formula:

$$\text{Operating profit margin}(\%) = \frac{\text{Operating profit}}{\text{Revenues}}$$

The higher the margin, the better, as this indicates that the company is effectively controlling its costs. A high operating profit margin may also suggest that sales are growing faster than costs, thus putting the firm in a relatively strong liquidity position. The key difference between gross and operating profit margin is that the gross profit margin only accounts for the cost of goods sold (COGS), whereas the operating profit margin accounts for the COGS and other operating expenses – eg, selling, general and administrative expenses (SG&A).

Net Profit Margin

The net profit margin analyses profitability further by taking into account interest, taxation and all other costs in order to find the final benefit of the income of a business. Hence, net profit margin measures how successful a company has been at the business of making a profit on each sale.

The formula for calculating net profit margin is:

$$\text{Net profit margin}(\%) = \frac{\text{Net income}}{\text{Revenues}}$$

Additionally, net income is essentially profit before interest and tax (PBIT); thus, the net profit margin can also be written as:

$$\text{Net profit margin}(\%) = \frac{\text{Profit before interest and tax}}{\text{Revenues}}$$

Analysing Profit Margins and ROCE

Profit margins are some of the important financial ratios, as they include all factors that influence profitability, whether under management control or not. Profit margins should be compared to industry standards to provide context, and should be analysed over several accounting periods to assess trends and consistency. Compared with the industry average, they tell investors how well the management and

operations of a company are performing against its competitors. Compared with different industries, it tells investors which industries are relatively more profitable than others.

In all cases, revenues also refers to sales or turnover; hence, in the formulae, 'revenue' is interchangeable with 'sales' or 'turnover', depending on the terminology used in the financial statements.

$$\text{ROCE} = \frac{\text{Profit before interest and tax}}{\text{Capital employed}}$$

$$\text{Net profit margin} = \frac{\text{Profit before interest and tax}}{\text{Sales}} \qquad \text{Asset turnover} = \frac{\text{Sales}}{\text{Capital employed}}$$

If we multiply the profit margin by the asset turnover, we get back to the ROCE since the sales figures will cancel out.

Example

Assume ABC ltd has sales of £5 million, a trading profit of £1.5 million and the following items on its statement of financial position:

- Share capital £1.0m
- Reserves £5.0m
- Loans £1.0m
- Overdraft £0.5m

Its ROCE, profit margin and asset turnover can be calculated as follows:

ROCE:

$$\frac{\text{Profit before interest and tax}}{\text{Capital employed}} \text{ or } \frac{£1.5\text{m}}{(£1.0\text{m} + £5.0\text{m} + £1.0\text{m} + £0.5\text{m})} = 0.2 \text{ or } 20\%$$

Profit Margin:

$$\frac{\text{Profit before interest and tax}}{\text{Sales}} = \frac{£1.5\text{m}}{£5\text{m}} = 0.3 \text{ or } 30\%$$

Asset Turnover:

$$\frac{\text{Sales}}{\text{Capital employed}} = \frac{£5\text{m}}{£7.5\text{m}} = 0.67$$

Net profit margin and asset turnover can be used in conjunction with ROCE to gain a more comprehensive picture of a company's performance. However, these results then need to be interpreted in the context of comparative firms (in the same or similar industries) to determine whether they represent a positive picture or a cause for concern.

The asset turnover ratio tends to be inversely related to the net profit margin (ie, the higher the net profit margin, the lower the asset turnover). The result is that investors can compare companies using different models (low-profit, high-volume versus high-profit, low-volume) and determine which one is the more attractive business.

Equity Multiplier

The equity **multiplier** is a financial leverage ratio that evaluates a company's use of debt to finance its assets. It is calculated as follows:

$$\text{Equity multiplier} = \frac{\text{Total Assets}}{\text{Shareholders' funds}}$$

A company with weak sales and margins can take on excessive debt and artificially increase its return on equity (ROE). The equity multiplier allows the investor to understand what portion of the return on equity is driven by debt, rather than operational performance.

The formula for calculating ROE is:

$$\text{ROE} = \text{Net profit margin x Asset turnover x Equity multiplier}$$

Economic Value Added (EVA)

Economic value added (EVA) measures a company's financial performance and surplus value created on an investment. It is determined by deducting the cost of capital from the company's operating profit, as follows:

$$\text{EVA} = \text{Net Operating Profit after Taxes} \quad (\text{Invested Capital x Weighted Average Cost of Capital})$$

If a company's EVA is negative, this indicates that the company is not generating sufficient returns to cover its cost of capital, thus effectively destroying value. Conversely, a positive EVA indicates that the company is generating value for its shareholders.

EVA is used on the principle that a business is only profitable when it creates returns that exceed the cost of capital invested for its shareholders.

EVA Examples

1. An investment manager wants to calculate the EVA of an investment. The company's net operating profit after taxes is €8,000, equity is €50,000 and long-term debt is €5,000. WACC is 9%.

   Based on this information, capital invested is €55,000 (ie, €50,000 + €5,000). Therefore, the EVA is: €8,000 – (€55,000 x 0.09) = €3,050. As the figure is positive, this indicates the company is generating value, so the portfolio/fund manager decides to proceed.

2. The investment manager considers a second investment that has a net operating profit after taxes of 80,000 yuan, equity of 250,000 yuan and long-term debt of 300,000 yuan. WACC is 15%.

   From this information, capital invested is 550,000 yuan (ie, 250,000 yuan + 300,000 yuan). Therefore, the EVA is: 80,000 yuan – (550,000 x 0.15) = -2,500 yuan. As the figure is negative, this indicates the company is generating poor value, so the portfolio/fund manager decides not to invest at this time.

3.4 Liquidity Ratios

Learning Objective

3.3.4 Be able to analyse financial data using the following liquidity ratios: working capital (current) ratio; liquidity ratio (acid test or liquidity); Z-score analysis

Liquidity ratios offer insights into a company's ability to meet its short-term financial obligations. These ratios are used to assess the firm's financial health and its capacity to quickly convert assets into cash in order to cover debts as they come due. As a result, they help investors and creditors to gauge the risk of cash flow problems or potential insolvency.

3.4.1 Working Capital (Current) Ratio

The working capital ratio (more commonly referred to as the current ratio) is simply calculated by dividing a company's current assets by its current liabilities as follows:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

Although a company will want to hold sufficient stock to meet anticipated demand, it must also ensure that it does not tie up so many resources as to compromise its profitability or its ability to meet its liabilities.

As a general rule, a current ratio of between 1.5 and 2 is most commonly acceptable, although the actual number will depend on the type of business and economic conditions. A lower number may indicate a higher chance of the company falling into liquidation, while a higher number may suggest that it has

too much inventory or is not investing its excess assets in the most productive and yield-generating manner.

3.4.2 Quick Ratio (Acid Test or Liquidity Ratio)

Stock is potentially illiquid, so the current ratio can provide a misleading result if the company holds large amounts of stock. The quick ratio (also known as the acid test or liquidity ratio) therefore excludes stock from the calculation of current assets, in order to give a tighter measure of a company's ability to meet a sudden cash call.

The formula for liquidity ratio is:

$$\text{Liquidity ratio} = \frac{\text{Current assets} - \text{Stock}}{\text{Current liabilities}}$$

For most industries, a ratio of more than 1 will indicate that a company has sufficient short-term assets to cover its short-term liabilities. If it is less than 1, this indicates that a company has more liabilities than current assets, which means that the company may have difficulty meeting its short-term obligations and paying its bills; to resolve this, the company may need to raise new finance.

3.4.3 Z-Score Analysis

A Z-score analysis is a statistical measure that is generally considered to be a more detailed way of establishing whether a company is dangerously close to becoming insolvent within a two-year period. It analyses such factors as the company's gearing and sales mix and distills these into a statistical Z-score:

- A Z-score higher than 3.0 indicates that a company is unlikely to go bankrupt within the next two years. The higher the Z-score, the lower the probability of bankruptcy.
- Conversely, a Z-score below 1.8 indicates that bankruptcy is likely. The lower the Z-score, the higher the probability.
- Companies that have a Z-score between 1.8 and 3.0 are in the 'gray area', and bankruptcy is as likely as it is not.
- If the Z-score is negative, this indicates that a company's insolvency is imminent.

Other danger signals include increased use of leased assets and an overdependence on one customer.

3.5 Cash Cycle

Learning Objective

3.3.10 Be able to analyse financial data to determine the cash cycle of a company

In short, the cash cycle (also called the working capital cycle or cash conversion cycle) represents how long it takes to purchase and then sell goods or other assets (ie, how long it takes from the initial outlay

until the items can be sold for cash). Companies that are aware of their cash cycle will also have control of their cash flow. Thus, cash flow analysis indicates the liquidity position and where, if applicable, the cash flow is damaging the business.

If, for example, it takes a long time for a company to collect money from sales, then there will be a drain on the company's working capital. The longer the cash cycle, the more capital is needed to run the business.

Having enough working capital is crucial to paying staff and ordering goods, among other things; and the cash cycle also has an impact on the risk the company poses to lenders where finance is needed. Companies will seek to be ahead of the game and use forecasting to determine the future cash cycle.

A cash cycle is calculated by taking the number of days it takes to sell your inventory less the days it takes to pay vendors, plus the days needed to collect outstanding invoices. The lower the number of days in the cash cycle, the better.

3.5.1 Trade Receivables Collection Period

The trade receivables (or debtors) collection period indicates how long, in terms of working days, a company can take to realise the value of its receivables, ie, convert them into cash.

$$\text{Trade receivables collection period} = (\text{Trade receivables}/\text{Revenue}) \times 365 \text{ days}$$

- The 'trade receivables' amount in the numerator represents those invoices that are unpaid at the time of preparing the company's statement of financial position (see section 1.2 of this chapter).
- Companies are assumed to be operating on the basis of granting credit to their customers; hence the denominator (revenue) represents the total invoiced sales during the year.
- Trade receivables divided by revenue thus illustrate the proportion of the year's unpaid sales (ie, the credit period extended to customers).

Example

Company XYZ plc has trade receivables of £4,683 and revenue of £31,311 in its accounting period. The trade receivable collection period is therefore (£4,683/£31,311) x 365 = 55 days.

The figure may sound like it is really long or short, but ultimately, its significance depends on the context of the industry and the company's specific industry. Is this normal for the industry? Has the figure improved or deteriorated since the previous year? It could certainly weaken the cash flow perspective if the firm pays its creditors more swiftly – this is considered in section 1.3.3, below.

Note that the trade receivables collection period can be distorted intentionally or unintentionally, if either or both of the 'trade receivables' or 'revenue' figures are not representative of the normal trading activities when the statement of financial position is prepared. Such a concern is particularly relevant where sales are seasonal – the level of trade receivables can fluctuate considerably during a trading year if sales are concentred during certain periods or seasons. The annual revenue figure is the total of all the sales, irrespective of their seasonal nature, which could make a substantial difference to a snapshot of the company's performance, depending on the year the statement of financial position is prepared.

3.5.2 Trade Payables Payment Period

The trade payables (creditors) payment period shows how quickly the company is settling its liabilities.

$$\text{Trade payables payment period} = (\text{Trade payables}/\text{Purchases}) \times 365 \text{ days}$$

'Purchases' are often replaced with 'cost of sales' if the purchases figure is unavailable. Cost of sales is confined to the direct costs of the business incurred in the production or supply of the product or services being sold; it does not include general and administrative expenses, for example.

Example

Company XYZ plc has trade payables of £2,550 and cost of sales of £24,234. Thus, the trade payables payment period for XYZ plc is (£2,550/£24,234) x 365 = 38 days. This figure is lower than the trade receivables collection period of 55 days, so cash is leaving the firm quicker than it is being received.

The invoiced payables should be compared with invoiced costs to obtain a worthwhile and valid comparison.

3.5.3 Inventory Days

Inventory days (or stock days) indicate how quickly a company sells its inventory.

$$\text{Inventory days} = (\text{Inventory}/\text{Cost of sales}) \times 365 \text{ days}$$

Example

During the year, XYZ plc held inventory valued at £3,723 on average. Recall that cost of sales is £24,234. Thus, inventory days = (£3,723 / £24,234) x 365 days = 56 days.

This ratio should be compared against industry averages. A high number of days implies poor sales and excess inventory, while a low number of days implies either strong sales or ineffective buying.

Inventory management is a critical area with regard to its working capital cycle efficiency. High inventory levels are unsatisfactory because there is an opportunity cost in tying up working capital in inventory. Inventory has an effective zero rate of return versus a rate of return available from other current assets, such as short-term money market instruments. It also exposes the company to write-downs of current assets if prices for its marketplace begin to fall.

The same problem relating to the static nature of the inventory days ratio arises as in other ratios. The balance sheet preparation date may give an unrepresentative view of the matter, especially for a business with seasonal demand and hence seasonal inventory levels.

Depending on the information provided in the statement of comprehensive income (see section 1.3), it may not be possible to establish an accurate 'cost of sales' figure. In this case, a revenue figure could be used, but this would be computed on a value-added basis rather than a cost basis and will distort the ratio. With this qualification in mind, the more general use of the ratio is to track changes or trends. Often, these changes/trends are more important in financial and accounting analysis than any single ratio value itself. Any observable trend in this ratio from one year to the next may indicate a surplus or deficit of inventory.

It is important also to consider the nature of the business as the appropriate levels of inventory and the inventory days rate vary greatly among industry sectors. For example, inventory days for a supermarket would be very low for its perishable products, such as milk. In contrast a vineyard owner whose inventory takes several years to mature would expect a much higher inventory days rate.

It is prudent to examine the circumstances of a business when interpreting the ratio. Increased inventory turnover may naively be considered as indicative of a well-run business but may be due to very low levels of inventory, which can result in loss of sales and hence a deterioration in a company's reputation.

3.6 Investor Ratios

Learning Objective

4.1.2 Be able to calculate using the following methods for equity valuation: earnings per share (EPS); historic and prospective price-earnings ratios (PERs); dividend yields; dividend cover; price-to-book

4.1.3 Understand equity valuations based on dividends: Gordon's growth model

4.1.4 Be able to analyse financial data to determine: earnings before interest and tax (EBIT); earnings before interest, tax, depreciation and amortisation (EBITDA)

Investor ratios measure a company's performance from the perspective of its shareholders and potential investors. By assessing the attractiveness of a company's stock, these ratios help investors to evaluate its market value, growth potential and expected returns. Hence, investors can use these ratios to make more informed decisions about buying, holding or selling shares based on the company's ability to generate returns and increase shareholder wealth.

The tax treatment of dividends depends upon whether they are paid on preference shares or ordinary shares:

- **Preference share dividends** are treated for income tax purposes as payments of interest and so are taxed in the same way as other forms of interest such as bank interest or bond interest payments.
- **Ordinary share dividends** are treated as dividend income.

3.6.1 Earnings Per Share (EPS)

Earnings per share is a measure of a company's profitability that is expressed in an amount per share so that meaningful comparisons from year to year and with other companies. The quality of a company's earnings stream and its ability to grow its EPS in a consistent manner are probably the most important factors affecting the price of a company's shares, not least because earnings provide the ability to finance future operations and the means to pay dividends to shareholders.

There are three principal measures we need to consider:

- Earnings per share (EPS).
- Earnings before interest and tax (EBIT).
- Earnings before interest, tax, depreciation and amortisation (EBITDA).

Earnings Per Share (EPS)

The earnings per share ratio measures the profit available to ordinary shareholders and is taken as the profit after the company has made all other expenses and payments.

EPS is calculated as follows:

$$\text{EPS} = \frac{(\text{Net income} - \text{Preference dividends})}{\text{Number of ordinary shares in issue}}$$

The resulting figure is known as basic EPS.

Earnings Before Interest and Tax (EBIT)

Earnings per share can also be calculated before the impact of interest payments and taxation, as follows:

EBIT = Revenue – Expenses excluding interest and taxes

or:

EBIT = Revenue – Cost of goods sold – Operating expenses

or:

EBIT = Net income + Interest + Taxes

EBIT is therefore also called operating earnings, operating income, operating profit, and profit before interest and taxes. By ignoring interest and taxes, EBIT helps to identify a company's ability to generate enough earnings to be profitable, pay down its debt and fund its ongoing operations; it is only useful in comparing the performances of similar companies in the same industry though, not across different industries.

Earnings Before Interest, Tax, Depreciation and Amortisation (EBITDA)

Earnings can also be analysed before making any financial, taxation and accounting charges through an EPS measure known as EBITDA. EBITDA provides a way for company earnings to be compared internationally, as the earnings picture is not clouded by differences in accounting standards worldwide.

EBITDA = Net income + Interest + Taxes + Depreciation + Amorisation

or:

EBITDA = Operating Income + Depreciation + Amortisation

Ignoring interest, taxes, depreciation and amortisation makes its easier for investors to track and compare how profitable companies are, regardless of their financing choices or depreciation/amortisation assumptions. It is particularly useful in the analysis of asset-intensive industries, which have significant amounts of property, plant and equipment – such companies have correspondingly high non-cash depreciation costs, which can obscure changes in their underlying profitability.

Diluted EPS

As you can see, basic EPS is calculated by dividing the profits by the number of ordinary shares in issue.

There are a number of reasons why a company may have to increase the number of shares it has in issue, which would reduce the earnings per share figure. For example:

- **convertible loan stocks** in issue

- warrants in issue
- share options issued but not yet exercised.

The diluted earnings per share figure looks at a worst-case scenario by increasing the number of shares on the bottom line of the calculation to a maximum.

3.6.2 Price/Earnings Ratio (PER or P/E ratio)

The price/earnings ratio (PER or P/E ratio) measures how highly investors value a company in its ability to grow its income stream.

The PER is calculated by dividing the market price by the EPS as follows:

$$\text{PER (x)} = \frac{\text{Share price}}{\text{EPS}}$$

A company with a high PER relative to its sector average reflects investors' expectations that it will achieve above-average growth; alternatively, its stock could be overvalued. By contrast, a low PER indicates that investors expect the company to achieve below average growth in its future earnings, or that its stock is undervalued.

Although PERs differ significantly between markets and industries, there could be several reasons why a company has a higher PER than its industry peers

These may include:

- A greater perceived ability to grow its EPS more rapidly than its competitors.
- Producing higher quality or more reliable earnings than its peers.
- Being a potential takeover target.
- Experiencing a temporary fall in profits.

One way to establish whether a company's PER is justified is to divide it by a realistic estimate of its average earnings growth rate for the next five years. A result below 1 indicates that the shares are potentially attractive; this is sometimes referred to as the price/earnings to growth (PEG) rate. A PEG rate that is greater than 1 is generally considered unfavourable.

PERs can be historic or prospective, depending on whether the historic or prospective EPS is used in the calculation. A historic (or trailing) PER looks at the history of the company's earnings and compares it to where it stands today; this can mean looking as far back as 25 years. In contrast, prospective (or forward or projected) PER uses an estimate for a company's future earnings potential; this may produce incorrect or biased results if the actual earnings prove to be different.

3.6.3 Dividends

Dividend Yields

Dividend yields indicate the expected return on a share so that it can be compared to other shares and other investments.

Dividend yields are calculated by dividing the net dividend by the share price as follows:

$$\text{Dividend yield (\%)} = \frac{\text{Net dividend per share}}{\text{Share price}}$$

There is no obvious relationship between the dividend yield and the perception of the company in the marketplace. A high dividend yield could arise because the company is regarded as insecure, resulting in a lower share price; and the dividend is the investor's reward for the additional risk they are incurring by investing in the company. Alternatively, it could be indicative of a company with strong cash flows and/or low capital expenditure. Companies operating in defensive sectors (eg, utilities and healthcare) also often make higher distributions – these companies are generally referred to as 'bond proxies' due to their bond-like characteristics in terms of providing low-risk, higher levels of income.

Dividend Cover

Dividend cover can be thought of as being a way of showing the number of times that the dividend could theoretically have been paid out to shareholders from available profits. It is calculated by dividing the total profits attributable to a company's ordinary shareholders (ie, EPS) by the total amount of dividend actually paid to them (ie, the net dividend per share):

$$\text{Dividend cover (x)} = \frac{\text{EPS}}{\text{Net dividend per share}}$$

Shareholders' dividends are safer if there is a high level of dividend cover (there is plenty of money available to pay their dividends).

Generally speaking, a dividend cover of 2x or higher is considered prudent, in that the company is perceived to be able to afford the dividend. An unusually high dividend cover implies that the company is retaining the majority of its earnings, presumably with the intention of reinvesting for future growth. This is common among companies that are still in a high growth phase, rather than more mature companies which are often expected to pay regular dividends.

A ratio below 1.5x might suggest a less sustainable dividend. If the ratio is less than 1x, then the company is paying a dividend that is greater than the year's earnings. The company is funding part of its dividend using earnings retained from previous years (ie, past reserves) and is said to be paying an uncovered dividend. This is more likely to be a cause for investor concern.

Dividend Valuation Model and Gordon's Growth Model

The dividend valuation model calculates the theoretical price of a company's shares, by discounting the company's expected future dividends into perpetuity. The formula is:

$$\text{Share price} = \frac{\text{Value of next year's dividend}}{\text{Required rate of return}}$$

The required rate for the formula rate of return refers to the minimum return expected by investors, which compensates them for the risk of the investment. It is typically derived by adding a risk premium to the risk-free rate (eg, the rate on a treasury bill) to account for the relative risk of the stock compared to a risk-free asset.

Example

ABC plc is expected to pay a dividend of 10p next year. Assuming the required return to equity holders is 11% and the dividend is expected to continue at this level, the share price should be 10p / 0.11 = 91p.

However, this formula does not account for the potential for rising dividends. This limitation led to the development of Gordon's growth model, which assumes that future dividends will grow at a constant rate.

The formula for Gordon's growth model:

$$\text{Share price} = \frac{\text{Value of next year's dividend}}{\text{Required rate of return-Growth rate of dividends}}$$

Example

Continuing with the example above, if ABC plc's dividends are expected to grow at a constant rate of 5%, then the share price should be 10p / (0.11 – 0.05) = 166.67p.

3.6.4 Price-to-Book Ratio (PBR or P/B Ratio)

The price-to-book ratio (PBR or P/B Ratio) measures the relationship between the company's share price and the net book, or asset value per share attributable to its ordinary shareholders.

The P/B ratio divides the share price by the net asset value (NAV) per share, and is expressed as a multiple to indicate how much shareholders pay for a company's net assets.

The formula is:

$$\text{P/B ratio (x)} = \frac{\text{Share price}}{\text{NAV per share}}$$

If the ratio shows that the share price is lower than its book value, it can indicate that it is undervalued or that the market perceives it will remain a stagnant investment. If the share price is higher than its book value, investors view it as a company with above-average growth potential.

3.7 Gearing Ratios

Learning Objective

3.3.7 Be able to analyse financial data using the following gearing ratios: financial gearing; interest cover

Gearing ratios compare a company's debt levels to its shareholders' equity. By showing how much of the company's capital structure is funded by debt, this helps investors, creditors and other stakeholders to assess the firm's reliance on borrowing. This, in turn, allows them to evaluate whether the company is over-leveraged or in a position to take on additional debt (eg, for expansion or investment purposes), thus helping to gauge its financial risk. A higher gearing ratio may indicate greater financial risk, while a lower ratio suggests more reliance on equity financing.

3.7.1 Financial Gearing

Investors prefer consistent earnings growth, or high-quality earnings streams, rather than volatile and unpredictable earnings. The quality of this earnings stream depends on whether the company's business is closely tied to the fortunes of the economic cycle, as well as the level of a company's **financial gearing** (alternatively termed 'leverage' or 'debt-to-equity ratio').

A company's financial gearing describes its capital structure, or the ratio of debt-to-equity capital it employs.

It is calculated as follows:

$$\text{Debt-to-equity ratio (\%)} = \frac{\text{Interest bearing debt} + \text{Preference shares}}{\text{Ordinary shareholders' equity}}$$

Preference shares are included in the 'debt' part of the calculation as their dividends take priority over the payment of dividends to ordinary shareholders.

A company's financial gearing can also be expressed in net terms by taking into account any cash held by the company, as this may be available to repay some of the company's debt.

Debt finance can enhance a company's earnings growth as it is a more tax-efficient and generally less expensive means of financing than equity capital. If it is excessive, however, it can also lead to an extremely volatile earnings stream, given that debt interest must be paid regardless of the company's profitability.

3.7.2 Interest Cover

Shareholders and prospective lenders to the company will also be interested in its ability to pay the interest on its interest-bearing debt. The impact of a company's financial gearing policy on the statement of comprehensive income is reflected in its interest cover, which is calculated as follows:

$$\text{Interest cover (x)} = \frac{\text{Profit before interest and tax}}{\text{Interest payable}}$$

The higher the interest cover, the greater the safety margin for its ordinary shareholders, and the more flexibility the company will have to raise additional loan finance without significantly impacting its ability to service interest payments or compromise the quality of its earnings stream. An interest cover of 1.5 or less indicates that its ability to meet interest expenses may be in doubt. However, this ratio, requires careful interpretation, as it is can be affected by changes in the company's capital structure and fluctuations in interest rates, unless the company employes fixed-rate finance or interest rate hedging.

3.8 DuPont Analysis

Learning Objective

3.3.6 Be able to analyse financial data using: DuPont financial ratio analysis; extended DuPont analysis

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If return on equity (ROE) is below average or lower than expected, then DuPont analysis (also known as the DuPont identity or DuPont model) helps to locate the part of the business that is underperforming.

DuPont analysis is named after the DuPont Corporation, one of the world's largest producers of chemicals and science-based, and which merged with Dow Chemical in 2017 to form DowDuPont. The company developed DuPont analysis in 1920, which is still used around the world today.

In brief, DuPont analysis breaks down ROE into three different components:

- **Operating efficiency** – which is measured by net profit margin. A company's primary factor is to maintain healthy profit margins and derive ways to keep growing its net profit margins (eg, by reducing costs, or increasing prices). As net profits increase, so too will ROE.
- **Asset use efficiency** – which is measured by total asset turnover; in other words, the efficiency of a company using its assets. Note that the ratio differs across different industries, although comparing firms in the same industry is useful. As asset turnover increases, this will positively impact ROE.
- **Financial leverage** – which is measured by the equity multiplier (ie, financial leverage). Debt should be used to finance the company's operations and growth; however, the use of excess debt to increase ROE can be detrimental to the company's financial health.

$$\text{ROE} = \text{Net profit margin x Total asset turnover x Equity multiplier}$$

If ROE increases due to an increase in the net profit margin or asset turnover, this is a positive sign for the company. However, if the ROE is increasing because of the equity multiplier and the company was already appropriately leveraged, this could indicate that the company is now overleveraged and, therefore higher risk.

DuPont Analysis Example

An portfolio manager is researching two companies, one of which they would like to include in a model portfolio. The two companies are in the same sector of healthcare: Bio Solutions plc and LifeChem plc. The two companies have been striving to increase their ROE.

Using DuPont analysis, the manager can decide which company is the best selection.

	Bio Solutions plc	LifeChem plc
Net income	$2,000	$2,500
Revenue	$8,000	$20,000
Average assets	$5,000	$8,000
Average equity	$2,000	$1,000

1. **Net profit margin** – the manager uses each company's net income and revenue to calculate the net profit margins:
   Bio Solutions plc: Net profit margin = $2,000 / $8,000 = 0.25 or 25%
   LifeChem plc: Net profit margin = $2,500 / $20,000 = 0.125 or 12.5%
2. **Total asset turnover** – the manager uses revenue and average assets to calculate each company's total asset turnover:
   Bio Solutions plc: Total asset turnover = $8,000 / $5,000 = 1.6
   LifeChem plc: Total asset turnover = $20,000 / $8,000 = 2.5
3. **Equity multiplier** – the manager uses each company's average assets and average equity to calculate the equity multiplier:
   Bio Solutions plc: Equity multiplier = $5,000 / $2,000 = 2.5
   LifeChem plc: Equity multiplier = $8,000 / $1,000 = 8

Finally, the manager uses the figures from each of these calculations, and the DuPont analysis formula, to calculate each company's ROE:

Bio Solutions plc: DuPont analysis ROE = 0.25 x 1.6 x 2.5 = 1%
LifeChem plc: DuPont analysis ROE = 0.125 x 2.5 x 8 = 2.5%

DuPont analysis shows that LifeChem has a higher ROE than Bio Solutions, although a large portion of LifeChem's ROE results from its equity multiplier. In comparison, a large portfolio of Bio Solutions' ROE comes from its net profit margin of 25%.

From this, the manager decides to select Bio Solutions.

While DuPont analysis has three components, extended DuPont analysis has five, as it further breaks down a company's net profit margin ratio into two more components: tax and interest.

These elements are then multiplied by the operating profit margin, as follows:

$$\text{ROE} = \frac{\text{Operating profit margin x Total asset turnover x Equity multiplier}}{\text{Tax retention rate x Interest expense rate}}$$

Note that net profit margin is used in the basic analysis, and operating profit margin in the extended analysis. This is because net profit margin includes all expenses (including taxes and interest), thus giving a broad view of overall profitability, whereas operating profit margin excludes the effects of taxes and interest as it only focuses on the company's core operating efficiency.

By removing the effect of taxation and interest from the operating profit margin ratio, companies can gain more precise financial insights, both about themselves and in comparison to their competitors. This enables them to identify areas where there is scope for improvement.

3.9 Limitations of Ratios

Learning Objective

3.3.8 Know the difficulties in using ratio analysis for: companies in different industries, different companies within the same industry, the same company over successive accounting periods

Financial ratios provide investors with a way of evaluating a company's performance compared with its own history and against its peers, and they can be invaluable when making decisions about companies in which to invest. However, it should be remembered that ratio analysis has its limitations, although it does prompt further investigation and allows investors or potential investors to ask questions.

For example:

- As financial statements contain historical data, ratios are not predictive. Past performance may not indicate future performance, particularly for research and development companies that may make a major discovery in medicine or technology, for example.
- Despite accounting regulations, accounting data can be window-dressed (ie, manipulated or presented in a way that exaggerates or distorts the company's financial position to make it appear more favourable than it actually is).
- Ratios do not provide all the answers and are of limited value in isolation.

Different companies within different industries tend to have different overall characteristics. For example, as we saw in section 3.1, some industries are more capital intensive than others. This means that different industries tend to have different overall financial performance metrics, thus making it harder to compare one with another.

Different companies within the same industry may be at different stages of building their business. For example, a new company may have very high debt levels and limited cash flow; hence it may have ratios that are poor compared with more established companies in the same industry. However, because of a culture of innovation and enterprise, it may actually perform better and ultimately give a higher return on investment.

While most countries around the globe have either adopted IFRS or converged their GAAP standards with the IFRS, thus standardising accounting rules, not all countries have adopted IFRS. Therefore, comparing industries/companies in different countries can also be difficult, where they have different accounting policies and standards.

4. Using Financial Ratios to Assess Investment Potential

When evaluating an investment or project, financial ratios (such as those covered in section 3) can provide key insights into a company's ability to successfully undertake and profit from that investment or project. For example:

- Profitability ratios help to determine how effectively the company can generate returns from its assets or equity, which assist in evaluating the potential profitability of the project.
- Liquidity ratios ensure that the company can handle the immediate cash outflows required for an investment.
- Gearing ratios indicate the level of financial leverage and associated risk, as higher debt could increase financial strain and affect the project's returns.

These ratios can provide a comprehensive view of a company's financial health when used in conjunction with tools such as discounted cash flow (DCF) analysis. The resulting net present value (NPV) and internal rate of return (IRR) help to determine whether the investment or project is likely to be profitable. We will consider NPV, IRR and DCF in the following sections.

4.1 Net Present Values

Learning Objective

3.3.5 Be able to analyse financial data to determine: net present values (NPV); internal rates of return (IRR)

Before considering present values, it is often helpful to first focus on calculating the future values (FV) of an investment or cash flow. Understanding how final values evolve over time gives a clearer picture of how much an investment could grow under a given rate of return.

For example, if you make a deposit of $1,000 that earns 5% interest annually, the value of that deposit increases each year, with interest being compounded on both the original principal and the interest already earned. After one year, the deposit will be worth $1,050 (ie, $1,000 × (1 + 0.05)); after two years,

$1,102.50 (ie, $1,050 x $(1 + 0.05)^2$, or alternatively $1,050 x (1 + 0.05)). After n years, the value of the deposit will be $1,000 x $(1 + 0.05)^n$.

We can rewrite this as follows:

$$FV = PV \times (1 + r)^n$$

where:

PV = the present value

FV = the future value

r = the required rate of return

n = the number of periods (eg, months, quarters, years)

We can then rearrange this formula to calculate the PV of a given FV, in order to determine the time-adjusted value of future cash flows when using methods such as discounted cash flow (DCF). The DCF technique seeks to discount an investment or project's expected cash outflows to determine their PV, thus allowing investors to compare the PVs of the expected cash inflows with the PVs of the expected outflows. In other words, it calculates the time value of both the costs and the revenues associated with the investment or project.

The formula to discount the expected future inflows and outflows back to the PV is as follows:

$$PV = FV / (1 + r)^n$$

In this case, r is also referred to as the discount rate, as it represents the amount by which the future value has to be discounted to return to the present value.

The difference between the PV of the inflows and the PV of the outflows is known as the **net present value (NPV).**

Example

A company is considering undertaking an investment project that will require it to spend £75,000. In return, the company expects to generate revenues of £20,000 in the first year and the same amount in each of years two, three, four and five. The discount rate it uses is 10%.

To calculate the present value (NPV) of the proposed expenditure, we know that the investment was made at the beginning of year one and so does not require discounting, but that we need to calculate the present value of the expected income streams as below:

Year	Cash Outflows	Cash Inflows	Discount Factor		Discounted Cash Flow	Total
1	–75,000.00			1.00	–75,000.00	–75,000.00
1		20,000	20,000.00 / 1.10^1 =	90.91	18,181.82	
2		20,000	20,000.00 / 1.10^2 =	82.64	16,528.93	
3		20,000	20,000.00 / 1.10^3 =	75.13	15,026.30	
4		20,000	20,000.00 / 1.10^4 =	68.30	13,660.27	
5		20,000	20,000.00 / 1.10^5 =	62.09	12,418.43	75,815.74
				Net Present Value (NPV) =		**815.74**

The difference between the cash outflow and the discounted cash inflows is £815.74 (ie, -£75,000 + £75,815.74), so the project has a NPV of £815.74.

If the NPV is positive, this indicates that the investment or project is expected to generate more value than the initial investment, after accounting for all associated costs. In other words, it should return more than the discount rate over its term. Conversely, a negative NPV suggests that the investment or project is expected to destroy value and should typically be rejected.

4.1.1 Internal Rate of Return (IRR)

Notably, though, the cash flows associated with any prospective investment or project are just estimates, and the cost of capital used may not always accurately reflect the associated risk. Hence, the calculated NPV will only be accurate in practice if the cash flow estimates prove correct.

Therefore, it is useful to establish the break-even rate of return, or that discount rate, which implies a zero NPV. This rate of return is called the **internal rate of return (IRR)** or DCF yield.

As the only accurate way to establish this IRR is through a lengthy process of trial and error, using a range of discount rates, an approximate IRR is usually derived through a short-cut methodology known as **interpolation**. Interpolation takes a lower discount rate that produces a positive NPV and a higher discount rate that results in a negative NPV and then finds the rate between them that produces a zero NPV.

Competing projects are usually ranked in ascending order of their respective NPVs rather than their IRRs, as the NPV provides a superior means of ranking. Instead, the IRR should only be used to establish the break-even rate of return.

The formula is:

$$\text{Approximate IRR} = r_1 + \left\{ \frac{\text{Positive NPV}}{(\text{Positive NPV} - \text{Negative NPV})} \text{ x } (r_2 - r_1) \right\}$$

The reference to r_1 and r_2 is to the discount rate used to produce a positive NPV and a negative one as explained in the following example. Note that only a straightforward calculation would be required in the examination.

Example

Assume that a project has the following cash flows. For the purposes of this example, we have chosen two different discount rates – 10% and 20% – as one results in a positive NPV and the other in a negative NPV.

Year	Cash Flows	NPV at 10%	NPV at 20%
1	–10,000	–10,000.00	–10,000.00
2	6,500	5,371.90	4,513.89
3	6,500	4,883.55	3,761.57
NPV		255.44	–1,724.54

Note:

- The discount rates selected should ideally produce a positive and a negative NPV.
- The first discount rate of 10% produces a positive NPV, which is referred to as r_1. The second discount rate of 20% produces a negative NPV, which is referred to as r_2.
- For simplicity, it is assumed that the expenditure in year 1 (shown as a negative cash flow) takes place at the beginning of the year and does not require discounting.
- The positive cash flow in year 2 is assumed to take place at the end of year 2 so that is discounted for the full two years. The net present value of the cash flow of 6,500 at a discount rate of 10% is $6,500 / (1 + 0.10)^2 = 5,371.91$. The NPV at a discount rate of 20% is $6,500 / (1 + 0.20)^2 = 4,513.89$.
- The positive cash flow in year 3 at an NPV of 10% is $6,500 / (1 + 0.10)^3 = 4,883.55$ and the NPV at a discount rate of 20% is $6,500 / (1+ 0.20)^3$.

We can use the formula to find out the approximate IRR as follows:

$$\text{Approximate IRR} = \left\{10 + \frac{255.44}{(255.44 - 1{,}724.54)} \text{x} (10 - 20)\right\} = \text{of } 11.7\%$$

Note:

- The discount rate that produces a positive NPV (r_1) of 10% is shown simply as 10, and a negative NPV (r2) of 20% is shown simply as 20.
- The result is shown as an approximate IRR. This is because it only gives the starting point for further calculations – as you can see from the table below, a discount rate of 11.7% does not give you an NPV of zero:

Year	Cash Flows	NPV at 11.7%
1	–10,000	–10,000.00
2	6,500	5,209.63
3	6,500	4,663.95
NPV		–126.42

- Instead, further calculations are needed to find out the actual IRR. As the discount rate is producing a negative NPV, it is too high and a lower one is needed.
- You might start identifying this by picking a discount rate of, say, 11%. Using this produces a positive NPV and so indicates a figure a little higher is needed. You would then use higher rates until, by process of trial and elimination you can narrow down the band in which the actual IRR can be found.
- Using a discount rate of 11.2% produces a negative NPV of –16.26, which is only a little too high, and a discount rate of 11.1% produces a positive NPV of 5.97, indicating that the actual IRR lies between the two. Further iterative calculations show that the actual IRR is 11.125%.

Year	Cash Flows	NPV at 11.125%
1	–10,000	–10,000.00
2	6,500	5,263.51
3	6,500	4,736.49
NPV		0.00

End of Chapter Questions

Think of an answer for each question and refer to the appropriate workbook section for confirmation.

1. **What are the categories of non-current assets of a company?**
   Answer reference: Section 1.2.1

2. **How is property accounted for in the statement of financial position under IAS 16?**
   Answer reference: Section 1.2.1

3. **What are capital reserves and are they distributable to shareholders?**
   Answer reference: Section 1.2.3

4. **Company A has a 15% stake in company B and exercises considerable influence over its management. How should the investment be accounted for?**
   Answer reference: Section 1.5.1

5. **A company has total assets of £100 million, current liabilities of £35 million, short-term borrowings of £5 million, and profit before interest and tax of £8 million. What is the return on capital employed (ROCE)?**
   Answer reference: Section 3.3.1

6. **What is asset turnover, and what does it measure?**
   Answer reference: Section 3.3.2

7. **A Z-score analysis on a company has produced a negative result. What is a z-score and what would the result indicate?**
   Answer reference: Section 3.4.3

8. **What is the price/earnings ratio used for?**
   Answer reference: Section 3.5.2

9. **A company has profit before interest and tax of £1 million and has interest payable of £750,000. What is its interest cover, and what would the result indicate?**
   Answer reference: Section 3.6.2

10. **What are the limitations of ratio analysis?**
    Answer reference: Section 3.8

Chapter Four

Securities Valuation

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This syllabus area will provide approximately 21 of the 80 examination questions

1. Overview of Securities in Investment Management

In the context of investment management, the term 'securities' encompasses a wide range of financial instruments, including equities, fixed income, money market instruments, derivatives and swaps, among many others. Each instrument offers distinct characteristics, risks and return profiles. The suitability of these investments within a client's portfolio depends on factors such as the client's investment objectives, risk tolerance, time horizon, liquidity needs and tax considerations.

For example, higher-risk securities (eg, equities) have the potential for higher returns over the long term, but are more prone to short-term volatility. In contrast, lower-risk instruments (eg, government bonds) tend to be more stable and provide consistent, modest returns over time.

Diversification within a portfolio often includes a mix of both high- and low-risk assets to reduce overall risk, as the correlation between these asset classes tends to be low or even negative. However, correlations can rise during periods of market stress, thus temporarily diminishing diversification benefits. Notably, combining assets with differing risk and return profiles (such as blending emerging market equities with more stable bonds) can enhance portfolio diversification, lowering overall risk while maintaining potential for return – this is the core principle behind modern portfolio theory (MPT), which is covered in chapter 1, section 10.2.

This chapter covers various types of securities in more detail including their main investment characteristics, behaviours and associated risks.

2. Equities

Learning Objective

4.1.1 Be able to assess the main investment characteristics, behaviours and risks associated with equities

2.1 General Features

Companies raise their initial capital (the money to carry on their activities) in two ways: through loan stock (bonds) and through share capital (equities).

Those who hold equities are referred to as shareholders. Shareholders are the company's part-owners, and they have rights that attach to that ownership (depending on the class of share that they hold – see section 2.2). The directors have a duty of care to the shareholders, as they are responsible for looking after their capital. However, this ownership means that shareholders bear more risk, compared with investors in corporate bonds.

2.2 Different Classes of Equities

A company's share capital can be broadly divided into two distinct classes of share: ordinary shares and preference shares.

2.2.1 Ordinary Shares

Ordinary shares represent the primary risk capital of a company.

This can be readily understood by considering that buying a company's ordinary shares confers what is known as an equity interest in the company; that is, a direct stake is taken in the company's fortunes. If the company does well, shareholders can expect to share in that success, but if it were to go bust, the investor could lose the total value of their investment. They are only entitled to receive what is left over once all other claims on the company's resources have been settled.

Over the longer term, ordinary shareholders have been handsomely rewarded for assuming this equity risk. However, in the short term, they have generally experienced greater volatility in returns than any of the other main asset types.

Ordinary shares are usually referred to as ordinary £1 shares, ordinary 25p shares or some similar variation, with the amount – £1 or 25p – representing what is known as their nominal value. Notably, ordinary shares are also called common shares, although a key difference between them is that common shares have no nominal value. Ordinary shares are used in the UK, Australia and China, among others; and common shares is the preferred legal form in the US, Japan and Greece, for example.

Ordinary shares are typically irredeemable as there is no specified provision for their repurchase by the company.

Nominal Value of Ordinary Shares

When a company is launched, individuals pool funds together to form the company. They may contribute equal or different amounts, and in return for their contribution, they will have a share in the company. This share represents their ownership interest and is represented by the number of shares they hold.

For example, imagine you and a friend decide to create a company, and you both agree to raise an initial amount of capital of is £100; however, you subscribe £60 worth of shares, and your friend subscribes £40 worth of shares. Thus, you own 60%, and your friend owns 40%. This ownership is reflected in the number of shares allocated to you.

You could set the nominal value of shares in the company at £1, in which case you would have 60 ordinary £1 shares and your friend 40 ordinary £1 shares. Your respective shareholdings determine the amount of the business that you own and how profits will be shared in the future.

In this case, the nominal value of the shares is £1. The company starts with 100 shares, each worth £1 each, totalling £100 of initial capital. As the business grows and its value hopefully increases, then you would own 60% of that worth – eg, if it becomes worth £10,000, then you would own £6,000 of it. However, the nominal value of your shares remains fixed at £1 each.

The nominal value is of no particular significance, except if a company wishes to issue further shares – it must do so at or above the nominal value. Further, in the event of the company going into liquidation, then the nominal value of the shares becomes relevant in determining the rights of shareholders regarding any remaining assets.

Shares of No-Par Value

Some countries have ordinary shares that have no **par value**. The US is the most obvious example where ordinary shares are instead referred to as common shares or common stock.

Under company law, a company's shareholders have what is known as limited liability. This means that they have no personal liability for the payment of the company's debts. Their liability extends only to the extent of any outstanding payment on the nominal value of the company's shares held if issued partly paid.

Partly Paid Shares

Staying with the example above, assume that instead of paying the full nominal value of each share when the business is incorporated, you each only pay half (ie, 50p). In that case, you still own 60 ordinary £1 shares, but they will be described as partly paid.

Should the business not go as planned and it has debts beyond what it owes, then as an ordinary shareholder, you have a liability for payment of those debts. However, under the legal concept of limited liability, your liability to make further payments to the company is limited to the unpaid amount. You have a liability to subscribe a further £30 – in other words, you committed to subscribe to 60 ordinary £1 shares, but paid only half of that, hence you are liable to pay the remaining amount to the liquidator of the company.

Other types of ordinary shares include non-voting, deferred and redeemable shares.

Non-Voting Shares

As the name implies, owners of non-voting shares (also called 'A' shares) do not have the right to vote at company meetings. In all other respects, they are identical to ordinary shares.

They have typically been issued by founders of companies, particularly family companies, where the existing shareholders do not want to give away any control.

Shareholders are increasingly reluctant to purchase non-voting shares, and they are likely to be traded at a discount to the voting shares, despite being entitled to the same level of dividend.

Similarly, a company can issue shares with restricted voting rights.

Deferred Shares

In order to retain an element of control, a company's original promoters may have deferred (or founders), shares that confer enhanced voting rights in exchange for their right to a dividend being deferred for a set period or until a condition has been met. For example, before the owners of these shares can be paid, then either:

- a specific amount of time must have elapsed since the shares were issued
- the profits have to exceed a certain level, or
- other classes of shareholders have to have been paid a predetermined level of dividend.

For publicly listed companies quoted on a main market, it is rare to see non-voting or deferred shares. They are more regularly encountered with unlisted companies or smaller companies that only have relatively small proportion of their shares listed on a stock exchange.

Redeemable Shares

On occasion, publicly listed companies will issue redeemable shares (also often referred to as 'B' shares or 'C' shares). This is often done as a way to return capital to the ordinary shareholders in a tax-efficient manner. A company must always have conventional ordinary shares in issue, and those shares cannot have redemption provisions as they represent the company's equity capital. If a company has been successful and built-up funds, there may come the point where it wants to return some of that capital to the ordinary shareholders. It could do so by paying dividends, or winding the company up and paying the funds to the shareholders.

The latter would be a dramatic solution, but paying out as dividends may involve significant tax liabilities for some shareholders. An alternative method is to issue redeemable shares to existing shareholders, who hold these shares in addition to their existing shareholdings. Redeemable shares have fixed dates on which they can be redeemed to the company in exchange for a cash payment. There is also a final redemption date at which the company will pay the nominal value of the shares. The range of redemption dates is intended to give shareholders flexibility over in choosing when to redeem their shares, so that they can time this decision to best suit their personal tax position.

2.2.2 Preference Shares

In addition to ordinary shares, companies can also issue preference shares. Financial institutions, such as banks, are common issuers of preference shares.

Preference shares rank ahead of ordinary shares for the payment of dividends and capital repayment in the event that the company is liquidated. Preference shareholders are usually entitled to a fixed rate of dividend, which is often expressed as a percentage of the nominal value of the shares. For example, a 6% preference share with a nominal value of £1 would pay a net annual dividend of 6p per share. However, the dividend is payable only if the company makes sufficient profits and the board of directors declares the dividend payment.

Most preference shares in issue are cumulative, which means that the shareholders are entitled to receive all dividend arrears from prior years before the company can pay its ordinary shareholders a dividend. Normally, preference shares do not carry voting rights except when the dividend is in arrears.

Other types of preference shares include participating, redeemable and **convertible preference shares**:

Participating Preference Shares

In addition to the right to a fixed dividend, holders of these shares are entitled to participate in the company's profits, if the ordinary share dividend exceeds a prespecified level. The additional amount payable is usually expressed and paid as a proportion of the ordinary dividend. Holders of participating preference shares participate more in the risks and rewards of share ownership than normal preference shares.

Redeemable Preference Shares

These shares are issued with a predetermined redemption price and date; they are identifiable by the fact that they will have a date in their title. Some redeemable preference shares are issued as convertible preference shares.

Convertible Preference Shares

These preference shares, as well as paying a fixed dividend, can be converted by the preference shareholder into the company's ordinary shares at a pre-specified price or rate on pre-determined dates. If not converted, then the preference shares continue to entitle the holder to the same fixed rate of dividend until the stated redemption date.

Convertible preference shares are usually issued in the following circumstances:

- **Takeovers** – the bidding company in a takeover will issue convertible preference shares to the target company's shareholders so as to defer the dilution of the bidder's ordinary share capital.
- **Company restructuring** – companies undergoing a capital restructuring may issue convertible preference shares to their creditors to waive outstanding debts.

Convertible preference shares have a specified conversion ratio, which sets out how many preference shares can be converted into one ordinary share. As a result, a conversion premium or discount can be calculated, as follows:

$$\left[\text{Conversion premium or discount} = \frac{(\text{Conversion ratio x market price of convertible shares})}{\text{Market price of ordinary shares}} - 1\right]$$

The conversion ratio in the formula refers to the number of convertible preference shares required to convert into one ordinary share.

If the convertible shares are trading at a discount, then they offer a less expensive way of buying the ordinary shares compared to buying the ordinary shares directly. This typically occurs when the price of the convertible shares has not kept pace with the rise in the ordinary share price or when the convertible shares offer a relatively lower dividend yield. The opposite is true if the convertible are trading at a premium.

The following example demonstrates how the calculation works and its application.

Example

A company has issued 7% cumulative redeemable preference shares at 110p. They are currently priced at 125p per share and can be converted into the company's ordinary shares at the rate of five preference shares for one ordinary share.

If the ordinary shares are priced at 600p, the conversion premium or discount is calculated as follows:

Conversion premium or discount = (5 x 125) / 600 – 1 = 0.042 or 4.2%

The result shows that the convertible shares are at a premium to the ordinary shares – in other words, buying the convertible preference shares is a more expensive route than buying the ordinary shares directly. However, the fixed rate of dividend currently being paid on the preference shares may be sufficiently attractive, when compared to that being paid on the ordinary shares, to justify the premium.

The fact that the shares are at a premium also indicates that it is not worth exercising the option to convert into ordinary shares. This can be seen by simply comparing the respective values of the shares as follows:

Shares	Number of Shares	Price	Market Value
Convertible Preference Shares	5	£1.25	£6.25
Ordinary Shares	1	£6.00	£6.00

When considering whether to convert the shares, an investor should also look at the effect that conversion will have on the income received.

2.2.3 Registered and Bearer Shares

Shares can be in either registered or bearer form.

Registered Shares

When investors purchase shares in a company, their share ownership is usually recorded in a register of shareholders – hence they are called registered shares.

A private company will typically issue a share certificate to each shareholder to show the number of shares that they hold. While the share certificate records the number of shares they hold and their name, it is the entry in the share register that is definitive proof of ownership.

Historically, when a shareholder wanted to sell their shares, they needed to complete a transfer form. The share certificate and the transfer form were then sent to the company in order to cancel the original ownership and update the share register with the new owner's name. However, this process was inefficient, and led to delays and difficulties in settling share transactions.

As a result, it is now common for share ownership to be held electronically, with transfers of ownership taking place through amendments to this electronic record – this process is known as book-entry transfer.

All developed markets require shares to be held and settled in this way. The shares held in this way may be referred to as immobilised or dematerialised:

- **Immobilised** refers to cases where share certificates are still issued but are held in a central vault, rather than being issued to individual shareholders (hence the term 'immobilised').
- **Dematerialised** refers to a process that was developed later, where the certificate is eliminated entirely and ownership exists solely in electronic form.

In many markets, the method used is dematerialisation, although it is not compulsory, so investors can still request and hold physical share certificates. However, this is usually only done by private shareholders who own just a few shares.

In most markets, one organisation – known as a central securities depository (CSD) – will be responsible for holding the electronic records and settling trades. In the UK, for example, this is undertaken by Euroclear while in the US, it is managed by the Depository Trust Corporation (DTC).

Bearer Shares

The alternative to registered share ownership is bearer share ownership.

This involves issuing a share certificate to represent the number of shares that an investor owns, but the key difference is that there is no name on the share certificate. The company only keeps a record of the share certificate issued, and each certificate has a unique number to identify it.

As there is no name on the share certificate or in the share register, transfer of ownership takes place simply by passing the certificate to another person. The person who holds the share certificate – the bearer – is the owner.

In practice, bearer shares are held by a CSD to overcome the problems that would otherwise arise from lost share certificates, and the risk of them being used by criminals to launder money.

Bearer is the method often used for **eurobond** and other international bond issues. Otherwise, few companies worldwide issue bearer shares, and many countries have phased them out in recent years to improve the transparency of company ownership.

Traditionally, few UK companies issued bearer shares, and they were abolished, after phasing out period, in 2016. This was in order to improve the transparency of company ownership.

2.2.4 Rights of Ordinary Shareholders

Rights of Ordinary Shareholders

As we saw in section 2.1, ordinary shareholders are the company's part-owners. Thus, they are entitled to a number of rights, which will be specified in the company's **Articles of Association.**

Under the Companies Acts, day-to-day control of the company is undertaken by the board of directors, which is empowered to act on behalf of the company. Hence, while ordinary shareholders are part-owners, the board has authority to manage the company on their behalf. However, as part-owners, shareholders need mechanisms to ensure that the board is held accountable for its actions and that shareholders have a say in key issues affecting the company – this is why shareholders are granted certain rights.

The rights of ordinary shareholders include the following:

- **Being notified in advance of, and attending, company meetings**
  - Companies are required to hold meetings where shareholders can hold the directors accountable for their management of the company.
  - These meetings include the **annual general meetings (AGMs)** and any extraordinary general meetings (EGMs) needed for special proposals that require shareholder approval (eg, a proposed).
  - Shareholders must be notified in advance of all company meetings and formal notice periods must be adhered to.
- **Receiving a copy of the company's annual and interim report and accounts**
  - The board of directors must present the annual report and accounts at the AGM for shareholder approval. The purpose is to seek shareholder endorsement of the company's management during the period, which is typically achieved by asking shareholders to vote on a resolution to accept the accounts.
- **Voting**
  - The directors present resolutions to the shareholders at company meetings, seeking their approval by a vote.
  - Shareholders are entitled to attend meetings and vote on the resolutions proposed by the directors.

- Generally, shareholders have one vote per share; and they can attend and vote in person, or appoint a proxy to attend and vote on their behalf.

- **Sharing in the profits of the company**
  - As owners of the company, shareholders participate in its profits through dividend payments (see section 2.2.5). The board of directors determines whether the company has sufficient profit to warrant a dividend; it is then for the shareholders to decide whether to approve the dividend proposed, by voting at the AGM.
- **Subscribing for new ordinary shares**
  - Shareholders have a **pre-emption right**, meaning that when the company wants to raise additional equity capital, they must first seek shareholder approval.
  - Existing shareholders are given the opportunity to subscribe to additional shares before those shares are offered to outside investors.

2.2.5 Ranking for Dividends

A dividend is a payment, or distribution, to shareholders out of the company's profits.

As part-owners, ordinary shareholders are entitled to participate in the company's profits. They typically receive this through dividends, although there are other ways in which they may benefit (eg, capital gains from the sale of their shareholding, provided that the share price increases). However, dividends can only be paid once all other company obligations have been met.

Preference shareholders have a prior claim on payment of their dividend, as indicated by the term 'preference'. Preference shares generally entitle holders to a fixed dividend (typically expressed as a percentage of the nominal value of the shares), and this must be paid before any dividend can be declared for ordinary shareholders. Unless the preference shares are non-cumulative, any unpaid dividends from previous years are paid first, followed by the current year's dividend – only then, if there is sufficient profit remaining, can an ordinary share dividend be declared. Arrears of dividends from a previous year are paid first, followed by that year's dividend, and then only if there is sufficient profit remaining can an ordinary share dividend be declared.

2.2.6 Ranking in Liquidation

Equity capital represents the risk capital of a company and is therefore the last to be paid out in the event of liquidation. On the liquidation of a company, its assets are realised and the proceeds distributed according to a specific order of priority.

In the UK, this order for payment is governed by the Insolvency Act 1986, as outlined below:

1.	Fixed-rate loans and bonds secured on the assets of the company.
2.	Preferential creditors.
3.	Floating-rate loans and bonds secured on the assets of the company.
4.	Unsecured loans and bonds and other unsecured creditors.
5.	Subordinated loan stocks.
6.	Preference shares.
7.	Ordinary shares.

The key point to note is that preference and ordinary shareholders are paid out only after all other claims are met. As with dividend payments, preference shareholders have priority over ordinary shareholders. Preference shareholders receive back the nominal value of the shares held if sufficient funds remain; ordinary shareholders are entitled to share remaining funds, if any.

3. Depositary Receipts

Learning Objective

4.2.1 Be able to assess the purpose, main investment characteristics, behaviours and risks of depositary receipts: American depositary receipts; global depositary receipts; beneficial ownership rights; structure; unsponsored and sponsored programmes; transferability

3.1 General Features

In recent years, investor demand for depositary receipts (DRs) has been growing, and is driven by the increasing desire of both individual and institutional investors to diversify their portfolios globally, reduce risk, and invest globally in the most efficient way possible.

DRs offer a cost-effective and simple way of investing in overseas companies, without the higher costs that are typically associated with owning foreign shares.

They are negotiable instruments representing an ownership interest in securities of a foreign issuer, typically trading outside its home market. Various types of DR exist, with each representing ownership in the shares of a company that is not domiciled in the named country, trades on that country's local exchanges, and is priced in local currencies. The two most common and widely used types are:

- American depositary receipts (ADRs)
- Global depositary receipts (GDRs).

3.1.1 American Depositary Receipts (ADRs)

American depositary receipts (ADRs) were introduced in 1927, initially to enable US investors to hold overseas shares without the high dealing costs and settlement delays associated with foreign equity transactions. Each ADR has a specific number of underlying shares, or a fraction of a share. They confer the same shareholder rights as if the shares had been purchased directly.

Today, ADRs are widely used by a range of investors to provide a simple, reliable and cost-efficient way to invest in other markets, while avoiding the complexities of international trading.

An ADR is dollar-denominated and issued in bearer form, with a depository bank acting as the registered shareholder. The depositary bank makes arrangements for matters such as dividend payments (denominated in US dollars) and voting via proxy at shareholder meetings. The beneficial owner of the underlying shares may cancel the ADR at any time and become the registered owner of the shares. The

US is a huge pool of potential investment, so ADRs enable non-US companies to attract US investors to raise funds. ADRs are listed and freely traded on the New York Stock Exchange (NYSE), the NYSE American (formerly known as American Stock Exchange (AMEX)) and Nasdaq. An ADR market also exists on the London Stock Exchange (LSE).

Example

Volkswagen AG (the motor vehicle manufacturer) is listed in Frankfurt and has two classes of shares listed – ordinary shares and preference shares – both of which have separate ADRs in existence. Other well-known companies, such as BP, Nokia, Shell and Vodafone, have issued ADRs.

3.1.2 Global Depositary Receipts (GDRs)

DRs issued outside the US are termed global depositary receipts (GDRs) or international depositary receipts (IDRs). They have been issued since 1990 and are traded on many exchanges, with increasing issuance from Asian and emerging market issuers in particular.

The rise of sophisticated international markets has driven a shift since 2001 toward GDRs, as global corporations increasingly seek to raise capital in international markets. In some cases, GDRs are created not just to raise capital but also to establish a presence in new markets, in order to increase the company's visibility and pave the way for future offerings.

The rise of sophisticated international markets has driven a shift since 2001 toward GDRs, as global corporations increasingly seek to raise capital in international markets. In some cases, GDRs are created not just to raise capital but also to establish presence in a new markets in order to increase the company's visibility and pave the way for future offerings.

3.2 Sponsored and Unsponsored Programmes

Issues of DRs can be either sponsored or unsponsored:

- **Sponsored programmes** involve DRs issued by one depositary appointed by the company under a deposit agreement or service contract. These programmes give the company control over the facility, provide flexibility on which exchange the listing takes place, and allow the company to raise capital.
- **Unsponsored programmes** involves DRs issued by one or more depositaries in response to market demand, but without a formal agreement with the company. This method is now little used by issuers due to the lack of control and associated costs.

3.3 Structure

Listing GDRs on an exchange involves a formal listing process. The company must appoint a sponsor, decide whether a public offer or placing is most appropriate, and meet the exchange's listing requirements.

In the UK, for example, the LSE's listing requirements are set by the FCA.

Some of the key requirements that have to be met include:

- GDRs must be freely transferable, fully paid and free from any restrictions on transfer.
- They must be admitted to trading on a recognised investment exchange (RIE).
- The expected aggregate market value of all GDRs to be listed must be at least £30 million unless shares of the same class are already listed on the LSE.
- At least 10% of the GDRs (not total share capital) must be in public hands.
- The GDRs must not impose obligations on the depositary except to the extent necessary to protect the GDR holders' rights.

Instead of listing on the main market, the issuer may choose to list on the Professional Securities Market (PSM) or **PLUS Markets**, where some of the obligations to be met will differ. The percentage of shares that may be converted into DRs will depend on local restrictions on foreign ownership. As described in section 3.1.1, the issuer will appoint a depositary bank and enter into a deposit agreement that defines the depositary's role, and allows it to issue the company's DRs.

Instead of issuing DR certificates, a master certificate is issued to a custodian, also known as the common depositary. They will hold the certificate on behalf of the depositary in an international CSD (ICSD), such as Clearstream and Euroclear. As DRs are issued and cancelled, the number of DRs outstanding automatically adjusts.

The company must announce its intention to float on the market via the exchange at least 10 business days before trading the shares, or 20 business days if they are joining from a designated market. DRs listed on the LSE are traded on the international order book (IOB).

In certain circumstances, the custodian bank may issue DRs before the actual deposit of the underlying shares. This is called a pre-release of the DR, and trading may occur in this pre-release form. A pre-release is closed out as soon as the depositary bank delivers the underlying shares.

3.4 Beneficial Ownership Rights

DRs carry most (but not all) ownership rights associated with the underlying shares:

- **Dividends** – DRs allow dividends to be converted and paid out in the currency of the DR (which is typically US dollars) after the deduction of any applicable fees.
- **Voting rights** – Good corporate governance practices require issuers to give their DR holders the right to vote at shareholder meetings. The depositary bank will provide DR holders with information on upcoming meetings and voting arrangements. DR holders will then receive their voting instructions and provide the custodian with their votes, along with any necessary paperwork to ensure their votes are included in the shareholder meeting.
- **Rights issues** – Due to the structure of DRs, DR holders cannot directly participate in rights issues. Instead, the depositary bank will sell the rights on behalf of the DR holders and distribute the proceeds accordingly.

3.5 Transferability

Once DRs are listed, they are traded and settled in the same way as other equities. The market price of a DR is typically calculated multiplying the underlying ordinary share price by the DR ratio (ie, the number of underlying shares that each DR corresponds to), and then adjusting for any transaction costs.

An adjustment may also need to be made for the currency, which involves converting the market price of the DR by the applicable foreign exchange rate. While DRs can be established in various currencies, they are usually priced in US dollars, so foreign investors will need to account for exchange rate fluctuations when converting the price into their local currency.

Example

One DR represents 0.5 ordinary shares, and the underlying ordinary share price is $100. Thus, the market price of the DR will be $50 (ie, $100 x 0.5).

For a European investor purchasing the DR, if the exchange rate is $1 = €0.80 then they would need to pay €40 (ie, 50 x 0.8) for each DR. Similarly, for a Japanese investor, if the exchange rate is $1 = ¥110 then the cost per DR would be ¥5,500 (ie, 50 x 110).

The typical settlement time for DR transactions is T+2 (ie, the trade date plus two business days). As a result, DRs trade in a similar way to other equities; however, one major difference is that they are not liable to stamp duty or similar transaction taxes, which may apply to other equity purchases in certain jurisdictions. For example, in the UK, stamp duty reserve tax (SDRT) is charged at 0.5% on other equity purchases.

In terms of custody and settlement, DRs will usually be held in a central securities depositary (CSD) – for example, in Europe at either Clearstream or Euroclear, and in the US at the Depository Trust and Clearing Corporation (DTCC) depositary bank.

4. Unlisted Investments

Learning Objective

4.3.1 Know the main investment characteristics, behaviours and risks associated with venture funding; private equity investment

Venture capital schemes are investment programmes designed to support small, high-risk companies, typically in their early stages of development, and which are often unquoted or unlisted.

To encourage investment, these schemes offer certain tax reliefs (in relation to income and/or capital gains tax) to eligible individuals (typically UK resident taxpayers) who buy and hold new shares, bonds or assets. Hence, such schemes are sometimes known as tax-advantaged venture capital schemes. These

reliefs apply in the year of investment and are available up to certain limits, which vary depending on the type of scheme. This is also provided that the investments are held for a minimum number of years – if the investment is sold before the required holding period, then there may be a clawback of the reliefs.

Eligible (or 'qualifying') individuals are typically UK resident taxpayers. Non-UK residents may also be eligible, although they can only claim tax relief against any liability to UK income tax.

There are three main types of venture capital schemes: venture capital trusts (VCTs), enterprise investment schemes (EISs) and seed enterprise investment schemes (SEISs).

4.1 Venture Capital Trusts (VCTs)

Venture capital trusts (VCTs) are UK-specific investment vehicles that are listed on the LSE. They are similar to investment trusts, in that they allow individuals to invest indirectly in a portfolio of small, higher-risk trading companies, whose shares and securities are often not listed on a recognised stock exchange.

Investment in VCTs attract special tax advantages; hence VCTs must gain HMRC approval to be treated as such. Once approved, VCTs are exempt from corporation tax on any gains arising from the disposal of their investments.

4.2 Enterprise Investment Schemes (EISs)

EISs are designed to help these small companies raise finance by offering a range of tax reliefs to investors who purchase new shares in those companies.

To be able to benefit from the tax concessions associated with investments into EIS shares, the investor must be a 'qualifying individual'. This refers to someone who is not connected with the company when subscribing, although they can subsequently become a paid director of the company.

Along with 'qualifying individuals', the shares purchased need to be 'eligible shares'. These are new ordinary shares that are not redeemable for at least three years.

The money raised from the issue of shares must be used for a 'qualifying trade' wholly or mainly in the UK, or for research and development that is expected to lead to a qualifying trade. Most trades qualify, but some activities (termed 'excluded activities') do not. For example, dealing in land or commodities, financial activities and property development are excluded activities. A company can carry on some excluded activities, but these must not be 'substantial' (ie, more than 20% of the company's activities, as defined by HMRC).

To qualify for EIS status, a company must:

- Be based in the UK, and have a permanent establishment in the UK.
- Carry on a qualifying trade.
- Not be controlled by any investor receiving their capital.
- Have gross assets of up to £15 million immediately before, and £16 million immediately after, issuing the eligible shares, or up to £20 million for knowledge-intensive companies (KICSs).

- Have fewer than 250 employees, or up to 500 employees for KICs, at the date on which the eligible shares are issued.
- Have raised less than £5 million (£10 million for KICs) in any one 12-month period and up to £12 million the company's lifetime.
- Have been trading for less than seven years, or ten years for a KIC.

A KIC is a company that focuses on research, development and innovation, often in sectors such as technology, life sciences and engineering.

4.3 Seed Enterprise Investment Schemes (SEISs)

Unlike EISs, SEISs focus on small and very early-stage companies. The scheme finances start-ups, to stimulate entrepreneurship and boost economic growth.

The criteria to qualify for SEIS status are broadly the same as for EIS, except that a company must:

- Have gross assets of up to £350,000 at the time of the share issue.
- Have fewer than 25 employees (or, if the company is the parent company of a group, this number applies to the whole group).
- Have raised less than £250,000 in total via SEIS investment, and have not raised any funds via EIS or VCT.
- Have been trading for less than three years.

4.4 Private Equity (PE)

Venture capital schemes are a subset of private equity (PE), which is another alternative investment class. Private equity encompasses a variety of investment vehicles including VCTs, EISs and SEISs, as well as other forms such as:

- **Leveraged buyouts (LBOs)** – a transaction in which a company is acquired using a significant amount of borrowed money (ie, leverage), with the aim of repaying the debt over time using the company's assets and cash flow.
- **Management buyouts (MBOs)** – a deal where a company's management team buys the company that they run, typically with external financing, often due to restructuring or succession planning.
- **Distressed asset investing** – involves purchasing financially distressed companies or assets at a discount, with the goal of turning them around for profit.
- **Mezzanine financing** – a hybrid form of funding that combines debt and equity characteristics, used to finance company expansion. Lenders bank below senior debt but above equity, and may receive equity participation.

Private equity has gained increased popularity among institutional investors in recent years, primarily due to its low correlation with broad equity market movements and the historically higher-than-average returns it has delivered. It is a key source of funding for many companies, and can take the form of equity, bond or – as described above – a combination of the two.

Private equity or venture capital can be sourced from either wealthy individuals or institutions. Deals can generate very large returns in a short period of time for investors. There are generally two types of private equity deals:

- small start-up companies, or
- taking over existing businesses with the potential to be transformed.

Private equity differs from obtaining business loans (from a bank, for example). A bank will generally foreclose and demand immediate repayment if a company runs into difficulty. In contrast, private equity is more committed to its investment.

Start-up finance and development capital is provided to small but potentially fast-growing unquoted companies; private capital investors usually realise a profit by selling their often significant equity stake, either through a trade sale or upon the company floating its equity in the **new issue** market.

Given the specialist nature of each type of transaction, it is vital that such investments are well diversified geographically, between industries, and across different stages of company development.

For some years, private equity firms have been accused of secrecy in their dealings and the ruthless pursuit of profit at any cost. High-profile takeovers have led to significant job losses, which has sparked concern about the broader social impact. The sector saw significant growth before the COVID-19 pandemic (fuelled by cheap debt in the wake of the global financial crisis of 2007-08) and strong investor demand. However, the post-pandemic recovery has been complicated by rising inflation and interest rates, and the ongoing cost-of-living crisis, all of which have placed greater financial strain on companies. These factors have contributed to increased volatility in the market, reinforcing that private equity remains a high-risk and long-term investment.

5. Money Market Securities

Learning Objective

4.5.1 Know the main investment characteristics, behaviours and risks associated with money market securities

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The money markets are the wholesale or institutional markets for short-term borrowing and lending, typically involving cash and high-quality, short-dated **negotiable securities** with maturities of up to one year (although three months or less is more common).

Thus, money market instruments are low-risk investments with short lifespans and high liquidity, meaning that they can be sold or redeemed very quickly, often within a day. These basic characteristics and the large size of issuers in the market make money market instruments very safe and liquid.

The dollar, euro and sterling money markets are particularly deep and liquid. The issuers are generally entities with high creditworthiness, making these instruments highly reliable.

5.1 Structure

Money market instruments are a contract between a borrower (issuer) and a lender (investor). The lender (the investor) pays a sum of money to the borrower (issuer) for a fixed period of time (the term to maturity). At the end of this period (at maturity), the principal is repaid to the lender. In exchange, the investor expects a return, which compensates for:

- the loss of access to funds during the period of the loan (known as the opportunity cost)
- the potential erosion of the real value of the money due to inflation, and
- the risk that the borrower could default on its obligation to repay the capital at maturity.

The primary investors in money markets are banks, which move reserves globally and often engage in speculation with regard to interest and exchange rates, leading to high levels of trading activity.

5.2 Types of Money Market Instruments

The main types of money market instruments are:

- **Cash instruments (eg, deposits and repos)**
  - Also known as time deposits, these are fixed-term deposits of up to one year, typically with banks and securities houses.
  - They are not negotiable, so cannot be liquidated before maturity.
  - The interest rate offered will be tied to a benchmark rate such as the sterling overnight index average (SONIA), the euro short-term rate (€STR)) or the secured overnight financing rate (SOFR), which are the overnight interest rates for borrowing in sterling, euros and US dollars respectively.

- **Treasury bills (T-bills)**
  - T-bills are issued at a discount to their nominal value (also called face value or par), and redeemed at their nominal value at maturity.
  - They are highly liquid, and considered to be a risk-free benchmark in the money markets when assessing the returns potentially available on other asset types because they are backed by the issuing government.
  - T-bills are also used by central banks as a monetary policy tool to absorb excess liquidity and influence short-term interest rates.
  - In the UK, T-bills are issued weekly via Bank of England auctions, usually with a 91-day term and a £100 redemption.

- **Certificates of deposit (CDs)**
  - Issued by commercial banks, CDs are negotiable fixed-term deposits with fixed interest rates.
  - They are typically issued with terms of up to five years. Holders can either retain the CD until maturity, or sell it in the money market if access to the funds is required before then.
  - CDs are more liquid than time deposits (see above) since they can be traded on the secondary market.
  - As fixed interest securities, the price of CDs fluctuates based on prevailing interest rates.

- **Commercial paper (CP)**
  - CP consists of unsecured, short-term promissory notes issued by companies to finance their short-term liquidity needs.
  - They are issued at a discount to their nominal value, with maturities of between eight and 365 days. Being redeemed at par, the return on CP entirely comprises capital gain.
  - Hence, CP is similar to T-bills in that both are short-term debt instruments used to meet liquidity, except that CP is issued by companies while T-bills are issued by governments.
  - CP therefore carries higher levels of default risk compared with T-bills, so the return offered is generally higher to compensate for this risk.

- **Bills of Exchange**
  - Issued by companies, a bill of exchange is essentially an invoice for goods or services provided. It specifies the amount due and the payment date.
  - Once the recipient formally accepts the obligation to pay the specified amount by the due date, the bill of exchange can then be traded at a discount to its nominal value until maturity.
  - To minimise the credit risk associated with holding a bill of exchange and to reduce the discount at which it can be sold, the issuer may obtain formal acceptance from an eligible bank to guarantee the nominal value of the bill at maturity. This transforms the bill of exchange into a bankers' acceptance (BA), where the bank guarantees payment of the nominal value at maturity.

5.3 Key Characteristics

Due to the short-term nature of money market instruments, most are issued in bearer form and at a discount to their nominal value in order to reduce the administrative burden associated with registration and the payment of interest.

The short maturities of money market instruments and the high quality of their issuers means that these instruments carry low investment risk. As a result, they usually offer very low return. However, this implies that their returns are unlikely to keep pace with inflation, thereby exposing investors to inflation risk. For example, if the return on a money market instrument is 1%, but inflation is 2%, then the investor's real return (adjusted for inflation) would be negative, so the purchasing power of their funds would be eroded.

Returns vary depending on the issuer's creditworthiness level, with T-bills at the lower end of the risk/reward spectrum and one-year commercial paper at the higher end.

Market liquidity is another key characteristic – money market instruments are highly liquid (ie, they can generally be bought and sold quickly), often within a day, with minimal impact on price. T-bills are considered among the most liquid instruments due to the size and stability of the government bond market, whereas CP and bills of exchange may be less liquid, depending on the issuer's creditworthiness and current market conditions. This high liquidity allows institutional investors to manage large cash flows and their short-term financing needs.

Investment in money market instruments is often subject to a relatively high minimum subscription, thus making them more suitable for institutional investors. Retail investors can gain exposure through money market funds.

5.4 Returns

The return on a money market instrument can either be in the form of income (interest) or capital gain (ie, the difference between the purchase price and the maturity value).

There are two main categories of money market instrument based on how returns are calculated:

- **Instruments quoted on a yield basis**
  - These are interest-bearing instruments.
  - Issued at their full nominal value, and the investor's return is in the form of interest or yield.
  - Types of instruments in this category include time deposits, CDs and some CP.

- **Instruments quoted on a discount basis**
  - These are discount instruments or zero-coupon bonds (ZCBs).
  - Issued at a discount and repaid at nominal value at maturity, and the investor's return is in the form of capital gain. However, in many jurisidcitions, this capital gain is subject to income tax, not capital gains tax (CGT).
  - Types of instrument in this category include T-bills, bills of exchange and most CP.

The date on which the instrument starts to accrue a return is called the value date; it marks the beginning of the term to maturity. If the instrument is negotiable, then the lender can sell it in the secondary market, and the principal will be paid to whoever holds the instrument at maturity.

6. Fixed Income

Learning Objective

4.6.1 Be able to analyse investment characteristics, behaviours and risks of the following bond classes: supranational; sovereign government; public authority: local government/ municipalities: short-, medium- and long-dated bonds; callable and putable bonds; undated bonds; floating rate; zero coupon; strips and repos

4.6.4 Be able to analyse investment characteristics, behaviours and risks of index-linked debt: retail price index as a measure of inflation; process of index linking; indexing effects on price, interest and redemption; return during a period of zero inflation

6.1 General Features

Also known as debt securities or bonds, fixed-income securities are a form of loan where an issuer (a borrower), issues a debt instrument in return for funds from an investor (a lender or bondholder).

The term 'bond' derives from the original use of the word: a tie or commitment (as in the saying 'my word is my bond'). This is because a bond represents a promise to repay the capital borrowed at some

defined point in the future; and also, in most cases, a certain amount of interest paid by the issuer to the lender in the intervening period.

There are several types of bonds according to the issuer. For example:

- government bonds (also called sovereign debt)
- corporate bonds
- supranational bonds
- public authorities bonds
- local government / municipalities.

There are several general characteristics that all bonds are likely to share, as follows.

6.1.1 Nominal Value

All bonds are issued with a fixed principal amount or nominal value (NV) (also known as face value or par value), which remains with the bond for its life. For example, the nominal value is normally £100 on UK bonds, $1,000 on US bonds, and CNY100 in China. The nominal value facilitates the calculation of yields (ie, the coupon payment as a percentage of the nominal value), enabling the calculation of the net present value (NPV) of the cash flows and redemption proceeds.

6.1.2 Price

The bond price is quoted in terms of the amount that an investor would have to pay in order to buy the NV of the bond in the secondary market from a seller. In the UK, the price is quoted in pounds and pence (decimal terms), in the US in dollars and cents, and so on.

The price may be trading above the NV (at a premium) or below the NV (at a discount). The market price is based on the market's assessment of the fair value, and is set by supply and demand in the marketplace. The cash flows that an investor will receive from the bond are capitalised with the market's expectations about the future pattern of interest rates. These rates are referred to as the term structure of the bond.

The quoted price is called the clean price, and this excludes the accrued interest that is due to the seller of the bond. The dirty price of the same bond is the total price payable by the buyer, and is the clean price plus the accrued interest.

6.1.3 Maturity Date

The maturity date is a predetermined date on which the NV of the bond is repaid by the issuer. Prior to that date, the bond can be traded on the secondary market.

Most bonds redeem on a single market date, called a bullet redemption.

Example

Consider the following bond, issued by the UK government:

Treasury Gilt 1.125% 22/10/2073

This bond matures on 22 October 2073, on which date the final coupon payment and the whole NV will be paid to the investor.

Bonds are classified in terms of how long they have to run before they are redeemed (ie, before the issuer repays the capital). In the UK, two different conventions are used:

	Financial Times	Debt Management Office (DMO)
Shorts	Under five years remaining to redemption	Under seven years remaining to redemption
Mediums	Between five and 15 years to redemption	Between seven and 15 years to redemption
Longs	Over 15 years to redemption	Over 15 years to redemption

Ultra short and ultra long bonds also exist. While they are not explicitly classified in these conventions, they are commonly recognised as having maturities of up to one year and over 30 years respectively. Over time, longs become mediums and then shorts as maturity nears. Note that other countries and organisations have their own classifications of shorts, mediums and longs.

Other bonds are perpetual (ie, there is no maturity date) – these bonds are also called irredeemable or undated bonds. The issuer is under no obligation to redeem the principal sum, so the coupon is paid into perpetuity; however, they may have the right to do so, if they wish – usually if they can refinance at a cheaper rate (eg, if interest rates have fallen). This poses a risk to investors, who may have to reinvest the redemption proceeds at a lower interest rate than what they were previously earning.

Broadly speaking, the longer a bond's maturity, the more volatile its price. This is because longer-maturity bonds have a longer period of time during which they are exposed to risk, such as inflation and interest rate risk.

Redemption Provisions

Occasionally, a bond may have a call provision, which gives the issuer the option to buy back all or part of the issue before maturity. These bonds are known as callable bonds. This provision is attractive to the issuer as it gives them the option to refinance the bond (ie, replace it with one at a lower rate of interest) when interest rates fall below the rate currently being paid on the bond. This is a disadvantage to the investor, though, as the bond may be called away before maturity, thus forcing the investor to reinvest at a lower rate of interest. Therefore, investors will likely demand a higher yield on callable bonds as compensation for this risk.

Call provisions can take various forms. One example is a sinking fund requirement, where the issuer is required to redeem a specified amount of bonds at regular intervals.

In some cases, a bond may have a put provision, which gives the bondholder the right to require the issuer to redeem the bond early, on a set date or within a specific time frame. These bonds are known as putable bonds. This provision makes the bond more attractive to investors, and can increase the likelihood of a successful bond issue. However, it also increases the issuer's risk that they will have to refinance the bond at an inconvenient time, so putable bonds tend to offer lower yields.

6.1.4 Coupon

The coupon is the amount of interest that an investor will earn each year on the NV of a bond. How often the coupon is paid is determined at issue – the frequency is typically every quarter, six months or once each year.

The vast majority of bonds are issued with a predetermined, fixed value for the coupon; hence they are known as 'fixed-interest' or 'fixed-rate' securities. However, some pay coupons that fluctuate in line with a broader index – eg, floating rate notes (FRNs) and inflation-linked bonds (ILBs). Some, such as zero coupon bonds (ZCBs), pay no coupon at all so investors receive their return in a different way compared to traditional bonds with regular coupon payments. We will now consider each of these types of bonds in turn.

Floating Rate Notes (FRNs)

Floating rate notes (FRNs), also known as floaters, have coupons that are tied to a short-term market rate of interest such as SONIA, €STR or SOFR. The coupons rate is adjusted regularly (eg, at one- to six-monthly intervals).

Hence, FRNs tend to be popular during periods of increased volatility in interest rates, particularly among institutional investors, money market funds, and those looking to manage interest rate risk. They are also favoured in times of economic uncertainty, or when central banks are expected to raise rates.

Inflation-Linked Bonds (ILBs)

Similarly to conventional bonds, holders of ILBs receive regular coupon payments as well as a principal repayment upon maturity. The key difference with ILBs is that both the coupon payments and principal repayment are adjusted for inflation (based on a specific inflation index). For this reason, ILBs are also called index-linked bonds or linkers.

Several governments around the world issue inflation-linked bonds, including those of the UK, US, Australia, Canada, France, Iceland, India, Israel, New Zealand and Sweden. Among these, the largest segment of the global market is US Treasury inflation-protected securities (TIPS).

The inflation rate used for the adjustment differs from country to country. In the UK, for example, the adjustment is based on changes in the retail price index (RPI). The UK government plans to reform the calculation of RPI by 2030 to align more closely with the consumer price index (CPI), including housing costs (CPIH). This change is expected to reduce the value of index-linked gilts (ILGs), as CPI measure

tends to be lower than RPI due to differences in their calculation methods (RPI uses an arithmetic mean, while CPI uses a geometric mean).

Notably, the inflation protection is not immediate or perfect as the adjustments involve an indexation lag (ie, there is a delay between the interest payment date and the inflation rate on which the adjustment is based). There are two methods for calculating the inflation uplift, depending on when and where the bond was issued:

- eight months for ILGs issued before September 2005, and
- three months for ILGs issued after September 2005, as well as for all other ILBs issued globally.

Both methods use the inflation rate over the months leading up to the upcoming coupon payment or maturity payment, and account for any accrued interest (ie, interest that has been earned but not yet paid). The coupons are adjusted using a daily adjustment ratio (known as the index ratio), as follows:

Index ratio = Inflation at the payment date, adjusted for the lag / Inflation at the base date

Interest payment = Coupon x Index ratio

The redemption proceeds are calculated in the same way.

Example

The 1 1/8% Index-Linked Treasury Gilt 2037, which was issued in February 2007 (ie, after September 2005), so a three-month indexation lag applies. The bond pays semi-annually, in May and November each year.

Let's assume that the next coupon payment is in November 2025. If no indexation were to apply, then this coupon payment would simply be £0.5625 (ie, half of 1 1/8) per £100 nominal.

Indexation does apply, though, so we require the RPI values for November 2006 and August 2025 (ie, three months before each relevant date). According to official data[1], the RPI value for November 2006 is 201.1. For August 2025, let's say it is 400. Therefore:

Index ratio = 400 / 201.1 = 1.99

Interest payment = £0.5625 x 1.99 = £1.1194

1 Office for National Statistics, December 2024. RPI All Items Index: Jan 1987 = 100. Retrieved from https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/chaw/mm23 (Accessed: January 2025)

The amount of capital that the investor receives on redemption will depend on the inflation rate up until three months before the bond is redeemed (or eight months, in some cases).

It should also be noted that, in some markets, there is no deflation 'floor', so the final redemption payment could be less than the face value of the bond if there is a general fall in the level of prices. For bonds with a deflation floor, investors still receive the full principal amount at maturity, even if deflation causes the adjusted principal amount to fall below the original face value. For example, for a 20-year ILB

issued today with a deflation floor, the floor would only take effect if inflation in 20 years' time is lower than it is today.

ILBs are attractive in periods where a government's control of inflation is uncertain, as they provide extra protection to investors. They are also appealing to long-term investors (eg, pension funds), who need to invest their funds with the assurance that returns will maintain their real value after inflation, thus ensuring that they can meet their future financial obligations. Notably, from 2021 through 2023, inflation surged to decades-high levels in many countries due to the end of COVID lockdowns, pent-up demand and the impact of Russia's invasion of Ukraine. Despite these inflationary pressures, ILB prices fell as investors anticipated that central banks (including the UK's Bank of England, the US Fed, and Europe's ECB) would take more aggressive measures to control inflation.

Zero Coupon Bonds (ZCBs)

There is also a variety of bond known as zero coupon bonds (ZCBs), or simply 'zeros', which pay no coupon. Instead, the investor makes their return by virtue of the fact that the bond is issued at a price well below its eventual redemption price (the latter usually being its face value). For example, a ZCB may be issued at £60 per £100 nominal, with an eventual redemption price at £100 per £100 nominal. This capital appreciation reflects the return on holding the bond. Hence, ZCBs are also called 'discount bond' or 'deep discount bond', among similar terms.

Tax Treatment of Coupons

In terms of tax, the coupon payments on most bonds are subject to income tax. These payments are generally made on a gross basis (ie, tax is not automatically deducted at source). That said, investors may be able to choose to have income tax deducted from the payment, a process known as 'electing for withholding tax to be deducted'. The investor's income tax liability on the coupons will depend on their other sources of income and the availability of any statutory allowances in their country (or countries) of residence, such as the personal savings allowance (PSA) in the UK.

The only exception to this treatment is ZCBs, among other types of discounted bonds. In many jurisdictions, the capital gain from these bonds is taxed as income, to prevent investors from using them to avoid income tax by obtaining a fixed return without the usual tax liabilities.

6.1.5 Security and Ranking

A bond issuer's promise to pay coupon interest and the principal amount at maturity, along with the investor's rights, are outlined in a written agreement called the indenture, which is detailed in the bond's prospectus. This agreement specifies key terms such as the coupon rate, maturity period, and any special features such as convertibility or callability. In the event of liquidation, bonds are repaid in order of seniority, with secured debt having priority over unsecured debt, and unsubordinated bonds (senior debt) being repaid before subordinated (junior) bonds. Secured and unsecured debt are covered in further detail in section 6.3.4 of this chapter.

Bond agreements often include covenants to protect bondholders by placing certain restrictions on the issuer. These covenants may limit the issuer's ability to take on additional debt, pay dividends or sell assets, thereby providing an added layer of security for investors.

6.1.6 Credit Ratings

Bonds are assigned credit ratings by credit rating agencies, the three main agencies being Fitch, S&P and Moody's. These ratings reflect the issuer's credit quality, and indicate to investors the likelihood that the issuer will be able to meet its debt obligations.

A bond with a credit rating of BBB (Fitch/S&P) or Baa (Moody's) and above is considered investment grade. These bonds are viewed as high quality with a lower risk of default, thus making them more attractive to conservative investors. Investment-grade bonds generally offer lower yields since the risk of non-payment is considered low.

On the other hand, bonds rated below BBB or Baa3 are classified as non-investment grade, also referred to as high yield, speculative or junk bonds. These bonds offer significantly higher returns compared to investment grade bonds of similar maturity, provided that the issuer maintains its ability to meet its debt obligations. Non-investment grade bonds have a higher probability of defaulting on their interest payments or principal repayment, which makes them riskier for investors. To compensate for this higher risk, these bonds typically trade at lower prices and offer higher coupon rates (or 'default premiums') to reflect the added risk that investors are assuming.

	Sub-Indices Rating Definition	Agency Equivalent Ratings		
		Fitch Ratings	S&P	Moody's
Investment Grade	AAA	AAA	AAA	Aaa
	AA	AA– to AA+	AA– to AA+	Aa3 to Aa1
	A	A– to A+	A– to A+	A3 to A1
	BBB	BBB– to BBB+	BBB– to BBB+	Baa3 to Baa1
Non-investment Grade	BB	BB– to BB+	BB– to BB+	Ba3 to Ba1
	B	B– to B+	B– to B+	B3 to B1
	CCC	CCC	CCC– to CCC+	Caa3 to Caa1

The difference in yield between investment grade and non-investment grade bonds of similar maturity is called the spread. The benchmark is typically a government bond issued by a stable economy, such as the US or Germany. Note that spreads continuously expand and contract as underlying economies and financial markets change over time.

6.2 Government Bonds

Learning Objective

4.6.1 Be able to analyse investment characteristics, behaviours and risks of the following bond classes: supranational; sovereign government; public authority: local government/ municipalities

4.6.10 Know the characteristics and uses of STRIPs and repos: use in packaged products; which gilts are suitable for stripping; resulting number of securities; coupon and redemption payments; a zero-coupon bond; payment dates

6.2.1 Features of Government Bonds

Governments are regular issuers of bonds; it is one of the key ways in which they raise money to pay for their day-to-day operations or to finance long-term projects such as infrastructure. Government bonds dominate the bond markets, with modern governments often running a budget deficit which leads to large-scale bond issuance. The secondary market can be run on stock exchanges (eg, France, Germany and the UK) or outside stock exchanges (eg, the US).

Government issue a wide range of bonds, with varying coupon rates and maturity dates, which can be used by investors to construct diversified bond portfolios. This broad choice, combined with the fact that government bonds are generally regarded as very safe, makes them attractive investments with both private and institutional investors (eg, pension funds, insurance companies and fund managers).

Conventional government bonds make up the largest share of the outstanding government debt, and typically assume the form of Treasury 1.75% 2029. The name of the stock is simply for identification, and its title will change country by country.

However, some governments also issue index-linked bonds (see section 6.1.4 of this chapter). For ILBs, the rate of inflation used to calculate interest and principal payments is typically measured with a three-month indexation lag; however, UK index-linked gilts (ILGs) issued before September 2005 are an exception with an eight-month lag. Note that UK gilts are currently linked to the retail price index (RPI), although this rate of inflation will be reformed by 2030 such that it will be more in line with the consumer price index (CPI) including housing costs, called CPIH; this change will likely result in a fall in the value of ILGs, as they will be linked to a lower inflation measure.

Coupons on most types of government bonds are typically paid out every six months, although in some cases, they may be paid quarterly. The coupon is expressed as a percentage of the NV (as is the usual convention), and paid gross (ie, without deduction of tax).

Government bonds are usually repayable on their maturity date, at which point the principal is returned to the bondholder and the loan ends. The maturity date is usually fixed. As governments can raise taxes, reduce spending or simply print more money to redeem their bonds at maturity, they are often described as risk-free. However, it should be recognised that they are only theoretically risk-free – governments have been known to default (eg, Argentina has defaulted nine times in its history), so the

guarantee is only as good as the government issuing it. Thus, government bonds are perhaps better considered as having minimal risk.

Government bonds can be denominated in the issuing country's domestic currency or in foreign currencies. For the latter, investors are exposed to the risk that the issuer may be unable to obtain foreign currency to redeem the bonds.

6.2.2 Issuers

Governments, international agencies and local authorities may issue government bonds.

It is typically the role of a government agency to issue government bonds. Examples include the Bureau of Public Debt in the US, the Ministry of Finance in Japan, and the Debt Management Office (DMO) in the UK. Bonds are issued into the primary market, often through auctions; and are then traded in the secondary market, either via a stock exchange ('on-exchange') or over-the-counter (OTC, also referred to as 'off-exchange') by market participants.

Apart from governments, other issuers include:

- **Supranational organisations** such as the IMF, World Bank, European Investment Bank and Asian Development Bank, known as supranational bonds.
- **Government-sponsored agencies (GSAs)**, known as 'agency bonds'. These are particularly common in the US, with examples including the Federal Home Loan Banks (FHLBs), the Federal National Mortgage Association ('Fannie Mae') and the Federal Home Loan Mortgage Corporation ('Freddie Mac').
- **Local government and municipalities** raise funds either through direct government financing or by issuing bonds.
- **Sub-sovereign, provincial, state or local authorities**. In the US, bonds issued by state and local government bonds are known as municipal bonds. These bonds are commonly used to finance local projects or borrowing; and are often tax-advantaged, especially for investors who live in the issuing municipality.

6.2.3 STRIPS

Government bonds may be stripped into their underlying cash flows (ie, each individual interest payment plus the single redemption payment), a process known as **separate trading of registered interest and principal securities (STRIPS)**. Each strip is then traded as a separate zero coupon bond (ZCB) with a known nominal redemption value. As each ZCB is purchased at a discount to this redemption value, the entire return is realised as a capital gain.

Example

A three-year gilt will have seven individual cash flows: six (semi-annual) coupon payments and a principal repayment.

In many countries, all conventional fixed-coupon government bonds are eligible for stripping. These bonds typically pay periodic payments on set dates (eg, semi-annual or quarterly), and a single principal redemption on maturity. For example, in the UK, there are two series of strippable gilts: those that pay coupons on 7 June and 7 December, and those that pay coupons on 7 March and 7 September.

The US Treasury market, for example, has a well-developed strip market with a wide variety of bonds of different maturities and coupons available for stripping. The secondary market for the zero coupon instruments (resulting from the stripping process) is very active.

STRIPS can be used both as a portfolio management tool and as a personal financial planning tool. The redemption proceeds from these bonds, each with its own unique redemption date, can be aligned with specific future liabilities or known future payments. They can also be used within structured products, where the ZCB provides capital protection, while a **call option** offers the potential for growth in line with an index.

All gains and losses on STRIPS held by individuals are taxed as income on an annual basis. At the end of the tax year, for tax purposes, individuals are deemed to have disposed of and reacquired their holdings of STRIPS at their then-current value. Any gain (or loss) arising during the year on the holding is taxed (or relieved) as income.

In the UK, STRIPS can be held by individuals within individual savings accounts (ISAs) on the same basis as conventional and **index-linked gilts**.

6.3 Corporate Bonds

Learning Objective

4.6.2 Be able to analyse investment characteristics, behaviours and risks of secured debt: corporates; financial institutions and special purpose vehicles; fixed and floating charges; debentures; types of asset-backed securities (ABS); mortgage-backed securities (MBS); securitisation process; roles of participants

4.6.3 Be able to analyse investment characteristics, behaviours and risks of the following types of unsecured debt: income bonds; subordinated; high yield; mini bonds; speculative illiquid securities (SIS); rating

6.3.1 General Features

Companies can borrow money in two main ways:

- loans and overdrafts from banks, where the company borrows directly from a financial institution, and
- via corporate bonds, which is money borrowed directly from investors in the form of IOUs.

Corporate bonds are a form of borrowing that a company must repay, typically with regular coupon payments. Debt finance can be less expensive than equity finance (ie, issuing shares), because investing in debt finance is considered to be less risky than investing in the equity of the same company. The

company is legally obliagated to pay interest on its debt before paying dividends to its shareholders, which provides more certainty for debt investors in compared to equity investors. Additionally, if the firm goes into liquidation, debt holders are repaid before shareholders.

However, raising money via debt finance carries risks for the issuing company. For example, regardless of its financial performance (eg, even if the company runs into financial difficulties), the issuer still has a legal obligation to service the coupon payments and principal repayment on time. Further, lenders may have the right to seize the firm's assets in the event of non-compliance with the loan terms – eg, a bank providing mortgage finance can technically seize the company's property assets in case of default, without requiring bankruptcy proceedings. The power to borrow must be laid out in the company's articles of association, and the decision regarding new debt must be approved by the board of directors and may require shareholder approval at the AGM.

6.3.2 Types of Corporate Debt

The development of financial engineering techniques has resulted in a wide variety of corporate debt instruments being issued and traded. Some of the main types are described below:

- **Medium-Term Notes (MTNs)**
  - MTNs are standard corporate bonds, with maturities usually ranging from nine months to five years, although the term can also apply to instruments with maturities as long as 30 years.
  - They differ from other debt instruments in that they are offered to investors continually over a period of time by an agent of the issuer, instead of in one single tranche of a sizeable, underwritten issue.
  - The market for MTNs originated in the US to close the funding gap between commercial paper (CP) and long-term bonds.
  - Note that 'medium-term' has nothing to do with medium-term maturity, as discussed in section 6.1.3 of this chapter. Rather, issuers provide a range of possible maturities (and corresponding yields) from which investors can choose.
- **Fixed-Rate Bonds**
  - The key features of fixed-rate bonds have already been described in section 6.1.4 of this chapter. Essentially, they have fixed coupons, which are paid either quarterly, half-yearly or annually; and they have predetermined redemption dates.
- **Floating-rate notes (FRNs)**
  - The key features of FRNs have already been described in section 6.1.4 of this chapter. Essentially, they are bonds that have variable rates of interest.
- **Zero-coupon bonds (ZCBs)**
  - The key features of ZCBs are aslo described in section 6.1.4 of this chapter. Essentially, a ZCB pays no interest; instead, it is issued at a discount to its nominal value and is eventually redeemed at the full nominal value.
- **Permanent interest-bearing securities (PIBS)**
  - PIBS are irredeemable fixed-interest securities issued by mutual building societies.
  - They offer relatively high semi-annual coupons, but are non-cumulative.
  - PIBS holders rank behind all other creditors in the event of liquidation.
  - If the building society has demutualised, its PIBS are reclassified as perpetual subordinated bonds (PSBs). Both PIBS and PSBs can be traded on the LSE.
  - The liquidity of PIBS is generally low, and bid-offer spreads are wide.

6.3.3 Financial Institutions and Special Purpose Vehicles (SPVs)

Like other companies or corporates, financial institutions issue bonds to finance borrowing. These financial institutions also arrange borrowing for themselves and others, by creating special purpose vehicles (SPVs). SPVs facilitate off-balance sheet finance – ie, the borrowing does not appear on the statement of financial position of the originating institution.

6.3.4 Secured and Unsecured Debt

Corporate debt can be secured or unsecured, depending on whether the company offers collateral to back the debt. This distinction is important because secured debt is considered safer for investors, usually resulting in lower interest rates for the issuer.

Secured Debt

When a company is seeking to raise new funds by way of a bond issue, it may offer security to provide investors with some assurance that the bonds will be repaid. In this context, security typically involves some form of charge over the issuer's assets (eg, its property or inventory) so that, if the issuer defaults, bondholders have a claim on those assets before other creditors. As a result, bonds backed by security are generally considered safer investments, which can lead to lower borrowing costs for the issuer.

In the corporate bond market, this security can be either a fixed or floating charge on the company's assets:

- A fixed charge is a legal claim that is specifically attached to certain fixed, permanent assets of the company.
- A floating charge provides a more general claim on assets that are constantly changing, such as the company's inventory or accounts receivable (see chapter 3, section 1.2.1). It allows the company flexibility to sell or dispose of those assets without breaching the terms of the charge, unless specifically restricted by an addendum.

In the event of liquidation, holders of fixed charges take precedence over those with floating charges.

The security type and its terms are formalised in a legal deed, with compliance overseen by an independent trustee appointed by the company. If the issuer breaches any of the terms, then the trustee has the authority to appoint a receiver to take control of and liquidate the assets covered by the charge to satisfy bondholder claims.

Unsecured Debt

Unsecured debt does not offer any specific collateral to back the bond issuance. Instead, the investor's confidence in the company's ability to repay the debt relies solely on the issuer's general creditworthiness (see section 6.1.6).

In the event of default, unsecured creditors have no claim on specific assets of the company; they are simply considered general creditors, and will only be repaid if there are remaining assets after secured creditors and other senior claimants have been satisfied. As a result, unsecured debt is considered riskier

for investors than secured debt, and typically carries higher interest rates to compensate for that added risk.

There are several types of unsecured debt instruments, each varying in terms of risk, priority of repayment and potential return. Some common examples include income bonds, subordinated bonds, high-yield bonds and mini bonds:

- **Income bonds** are the most junior type of bond. Interest payments on these bonds are made only after the issuer earns a specified amount of income. The issuer is not bound to make regular or timely interest payments if the minimum income amount is not met. The investor in income bonds must understand the associated risks, and may be willing to invest in these bonds if there is an attractive coupon rate or high yield.
- **Subordinated bonds** are those in which lenders agree that, if the company fails, they will only be repaid after other creditors have been paid, and only if there is enough money left over. Interest payments on subordinated bonds are typically higher than those on equivalent unsubordinated debt, which reflects the additional default risk faced by subordinated lenders.
- **High-yield bonds** (often referred to as non-investment grade, junk or speculative bonds) are typically rated below BBB/Baa by credit rating agencies (see section 6.1.6). These bonds require issuers to provide a higher coupon to attract investors, and compensate them for the higher risk of default. Unlike in the past, there are no significant obstacles to issuing high-yield debt in the capital markets today, as the market is generally adept at 'pricing in' the additional risk, which is reflected in the terms of the issue, including the coupon rate.
- The term '**mini bond**' has no legal definition, but it generally refers to unlisted debt securities. These bonds are typically issued by companies to raise finance from retail investors. In return, investors receive a regular fixed return over the life of the bond (typically three to five years), and the initial investment upon maturity.

  Unlike conventional bonds, however, mini bonds are illiquid. They must therefore be held until maturity, which makes them a less flexible investment option. In the event of the issuer's bankruptcy, mini bonds investments are not necessarily protected by compensation schemes (eg, the Financial Services Compensation Scheme (FSCS) in the UK), so investors may lose their money. Therefore, they remain high risk for investors, and are generally only suitable for those with a high risk tolerance and a clear understanding of the potential for loss.

  For issuers, mini bonds offer certain advantages. Since they are not listed, the regulatory requirements are less stringent than those for listed bonds, which allows issuers to save time and reduce the paperwork associated with complying with formal listing procedures.

  Although mini bonds are commonly associated with the UK, they are also issued globally with varying regulatory frameworks. For example:
  - In the UK, mini bonds are subject to FCA regulations that ensure transparency, fair treatment and informed decision-making for retail investors, particularly highlighting the illiquid nature and high-risk profile of these bonds.
  - Similarly, in Europe, mini bonds are becoming an alternative financing source for small and medium-sized enterprises (SMEs), although they must meet certain regulatory standards.
  - In contrast, the US primarily uses private placements for unlisted debt, regulated under the Securities Act of 1933, targeting accredited investors with more stringent reporting and disclosure requirements.
- **Speculative illiquid securities (SIS)** are high-risk debt instruments that lack liquidity due to limited market depth; hence they can be hard to price and difficult to trade. These seucirites are often issued by financially unstable companies or those operating in niche markets. Due to their speculative

nature, SIS carry a high risk of loss, particularly in the event of issuer default or bankruptcy; and as they are typically unsecured, they are not backed by any specific collaterall. SIS therefore usually offer higher yields to compensate investors for the additional risk. Their illiquidity and volatility make SIS unsuitable for most retail investors, and instead, SIS are primarily targeted at institutional investors with specialised expertise.

6.3.5 Debentures

The term 'debenture' is used differently from one country to another, so it is important to understand the local definitions. Let us consider the UK and the US definitions as examples.

The UK

In the UK, a debenture refers to a bond that is secured on specific assets of the company. A debenture is a legal document that grants a charge over these assets. It will appoint a trustee who is responsible for safeguarding the interests of the bondholders, and taking action to enforce the charge if the company fails to meet the terms of the debenture.

Debentures, along with details of their charge, must be registered under the Companies Act 2006 with Companies House. The purpose of this registration is to publicise the priority of the debenture in the event of the company's default. This does not extinguish the debt itself, but it does ensure that the lender's claim takes precedence over unsecured creditors. If the registration is not made, then the lender's rights to the specific asset could be lost, and they may be treated as an unsecured creditor.

By contrast, the term `loan stock' is used to describe debt securities that are not secured on specific assets.

The US

In the US, however, the meaning of 'debenture' differs. Here, a debenture is a type of debt instrument that is not secured by physical assets or collateral. Instead, debentures are backed only by the general creditworthiness and reputation of the issuer. Both corporations and governments issue debentures as a way to raise capital.

6.3.6 Securitisation and Asset-Backed Securities (ABSs)

Securitisation involves pooling together the rights to the future revenue streams from a collection of assets and issuing them as bonds. These securities are often referred to as asset-backed securities (ABSs).

ABSs are a type of bundled security, so-called because they are marketable instruments created by packaging together non-marketable assets. These assets include a wide range of financial assets including mortgages, credit card debt and accounts receivable, among other forms of debt. Hence, one type of ABS may differ from another.

A significant advantage of ABSs is that they convert illiquid assets into tradable instruments, thus making it easier to offer and sell them freely in the capital markets. By pooling a large portfolio of such assets, ABSs make it possible to trade a broader range of assets that might otherwise be difficult to sell

individually, thereby allowing investors to diversify into a wider range of assets beyond traditional ones such as equities, bonds and cash.

The largest and most widely known market for ABSs is mortgage-backed securities (MBSs), whose cash flows are backed by the principal and interest payments from a pool of mortgages. MBSs became globally recognised during the subprime mortgage crisis in the US, which triggered the global financial crisis. Since then, though, regulators have implemented stricter regulations on MBSs in order to reduce risk and increase transparency – for example, requiring higher levels of capital reserves, and mandating more rigorous disclosure of the underlying assets.

6.3.7 Roles of Participants

The key participants in the corporate debt market are:

- **The issuer** – the company or entity issuing the bonds.
- **The underwriter** – the institution responsible for managing the bond issuances in the primary market.
- **The debenture trustee** – a third party responsible for ensuring that the terms of the debenture are upheld.
- **Brokers/dealers** – firms involved in facilitating the buying and selling of bonds in the secondary market.

Exchanges (such as the LSE) provide venues for trading of corporate debt instruments. Further, there is a global, de-centralised electronic network of dealers that facilitates the trading of corporate debt.

6.3.8 Ratings

Bondholders face the risk that the issuer may default on its obligation to pay both interest and the principal at redemption. This risk, known as credit risk, refers to the likelihood of an issuer defaulting on its payment obligations and the extent of the resulting loss. Credit risk can be assessed by reference to the independent credit ratings assigned to most bond issues, as discussed in section 6.1.6 of this chapter.

Unsecured debt typically carries a lower credit rating compared to more secure debt instruments, such as those backed by collateral, which offer greater protection to bondholders in the event of liquidation.

6.4 Calculating Bond Returns

Learning Objective

4.6.5 4.6.5 be able to analyse fixed income securities using the following valuation measures: flat yield; nominal and real return; gross redemption yield (GRY); net redemption yield (NRY); yield curve analysis

4.6.9 Be able to analyse characteristics of the yield curve: normal; flat; inverted

6.4.1 Flat Yield

The simplest approach to establishing the return from a bond is to calculate its flat yield, also known as the running or interest yield.

This expresses the coupon as a percentage of the bond's market (or clean) price. The formula for calculating the flat yield is:

$$\text{Flat Yield (\%)} = \frac{\text{Coupon}}{\text{Price}}$$

For example, a bond with a 6% coupon due to be redeemed at par in five years and currently priced at 110 will have a **flat yield** of 6/110 = 0.0545 or 5.45%.

There are three key drawbacks for using flat yield as a robust measure in assessing bond returns:

- **Exclusion of redemption flows** – flat yield only measures the coupon payments and ignores the redemption value, when applicable. It therefore gives an incomplete picture of the actual bond returns. A bond that has been purchased at a price different from its redemption value will be either under- or overvalued when the nominal value excluded from the calculation.
- **Neglecting time value of money** – the calculation completely disregards the timing of cash flows and, because it does not incorporate **discounted cash flow** analysis. As a result, it completely overlooks the time value of money, which is a key factor in assessing bond returns.
- **Inapplicability to floating rate notes (FRNs) and inflation-linked bonds (ILBs)** – for FRNs and ILBs, the return in any given period will vary with changing interest rates and inflation rates respectively. Since the coupon payments are not fixed, using a flat yield to measure returns becomes arbitrary, as the calculation requires selecting a specific coupon amount from among many possible values.

6.4.2 Nominal and Real Return

The nominal return on a bond is simply its return, whilst the real return on a bond is the nominal return adjusted for the effect of inflation.

The real return can be approximated using the following formula:

$$\text{Real return} = \text{Nominal return} - \text{Inflation rate}$$

For example, if annual interest is paid at a nominal rate of 5% and the rate of inflation is 2%, then the real rate of return is approximately 3%.

The Fisher equation (named after American economist Irving Fisher) provides a more accurate measure of the real return:

$$R = [(1 + Ni)/(1 + Infl)]$$

where:

R = the real rate of return

Ni = the nominal rate of return

Infl = the rate of inflation

Example (continued)

Using the Fisher equation, R = [(1 + 0.05) / (1 + 0.02)] – 1 = 0.0294 or 2.94%.

6.4.3 Gross Redemption Yield (GRY)

When calculating the return on a bond, we also need to consider the gain/loss that an investor will make if a bond is held to redemption to determine the return the investor is actually receiving, which the flat yield ignores. To remedy this, the GRY is used.

Simply put, the GRY is a combination of the flat yield, plus the gain or loss that will occur if the bond is held to redemption, to give an average annual compound return.

In the example above, the GRY will be lower than the flat yield, as the market price is higher than the bond's par value and the bond will suffer a capital loss if held to maturity. However, if the market price is below par, then the GRY will be greater than the flat yield, as a capital gain will be made if the bond is held to maturity.

The formula for yield to redemption is complex, but a simple example will show its importance.

Example

Assume that there is a government bond that will be repaid in exactly seven years' time. Its current price is £105, so if an investor were to buy £10,000 nominal of the bond today then it will cost £10,500 excluding brokers' costs. The annual interest payments would amount to £500 and its flat yield is 4.76% (ie, £500/£10,500).

In seven years' time, however, the investor is only going to receive £10,000 when the bond matures so they will make a loss of £500 over the period (ie, £10,000 - £10,500).

If an investor were simply to look at the flat yield then this would give a misleading indication of the true return that they were earning. The true yield needs to take account of this loss to redemption, and this is the purpose of the GRY.

Very simply, the investor needs to write off that loss of £500 over the seven-year period of the bond. For ease of calculation, this works out to about £70 a year (ie, £500/7) so the annual return that the investor is receiving is actually £430.

It can be seen that this gives a more accurate indication of the return that the investor receives and can be used to compare the yields from different bonds to identify which offers the best return.

A simple formula for calculating the GRY is:

$$\text{GRY (\%)} = \text{Flat Yield} + \left(\frac{(\text{Par} - \text{Market price}) \div \text{Number of years to redemption}}{\text{Market price}} \right)$$

The way in which it is calculated in practice is more complex and the only way to get the answer is through a process of iteration to calculate the bond's internal rate of return.

Its use can be seen by considering GRYs for two theoretical government bonds.

Example

The following data gives the prices of two government bonds that are due to be repaid in 10 years' time at par of 100. Consider the data and identify which is producing the best overall return, assuming that the investor will hold the stock until redemption.

Coupon	Price	Flat Yield	GRY
8%	150.95	5.30%	1.92%
3¾%	112.41	3.34%	2.30%

Although the first bond appears to be the most attractive on the face of it, it will in fact produce a poorer overall return to the investor. An investor concerned with maximising their overall return will pick the

second bond, and only an investor prepared to sacrifice their capital at the expense of current income will select the first bond.

However, the GRY as a yield measure has its drawbacks. Firstly, it assumes that the bond will be held to redemption. More fundamentally, though, it assumes that the interest payment can be reinvested at the same rate as the bond – this inability to reinvest coupons at the same interest rate as the GRY is known as **reinvestment risk.**

6.4.4 Net Redemption Yield (NRY)

For a taxpayer, the GRY only tells part of the story. Any gain that is made if a bond is held until maturity is often likely to be free of tax, whereas the coupon payments will be subject to income tax in the investor's hands.

Redemption yields are also quoted on a net-of-tax basis, so a direct comparison can be made of the after-tax return to the investor. This can be calculated by using the same simple formula as above, but adjusting the flat yield to for the investor's income tax rate, as follows:

$$\text{NRY}\ (\%) = (1 - \text{Tax rate}) \times \left(\frac{(\text{Par} - \text{Market price}) \div \text{Number of years to redemption}}{\text{Market price}} \right)$$

The **net redemption yield (NRY)** allows investors to review the after-tax yields, to determine which will be most tax efficient for their particular tax position.

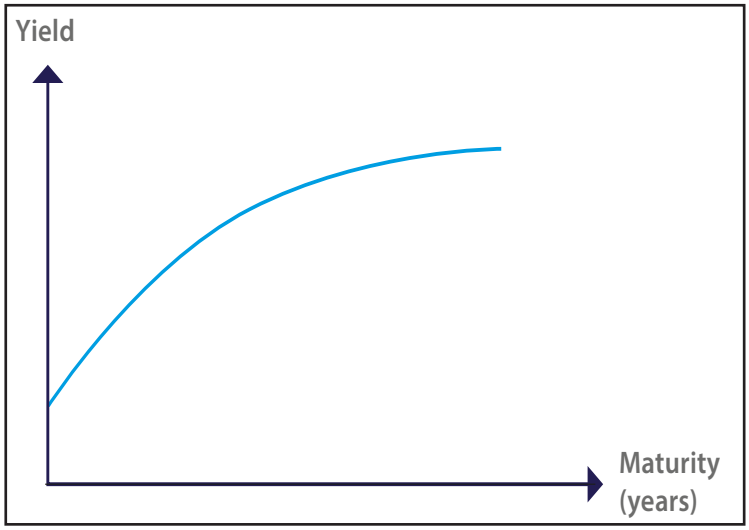
6.4.5 The Yield Curve

A yield curve is a graphical representation of the relationship between the yields of bonds with different maturities. It shows how bond yields change as maturity periods lengthen, with longer-dated bonds typically offering higher yields than shorter-dated ones. This relationship is known as the term structure of interest rates.

Yield curves can take on various shapes, each of which provides insights into market expectations regarding future interest rates, inflation and economic conditions.

Normal Yield Curve

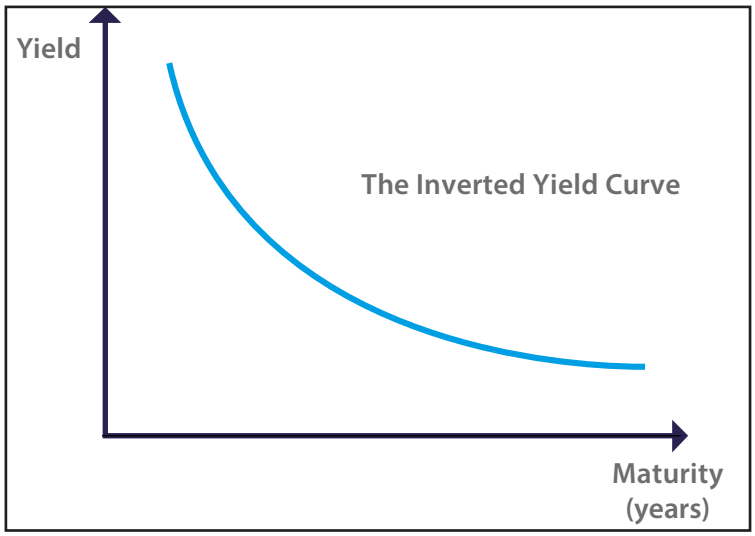
The yield curve typically takes on an upwards sloping, 'normal' state, which indicates that the economy is expanding. This positive slope reflects investors' demand for higher yields on longer-dated bonds compared to shorter-dated ones, in order to compensate them for the extra risks involved in having their money tied up for longer periods of time.



Note, though, that the actual yield curve fluctuates along the curve from short-term to long-term maturities. If the yield curve is steep, then the yields on short-dated bonds are relatively low compared to longer-dated bonds. This means that an investor can obtain significantly higher yields, and therefore greater income, by buying bonds with longer maturities rather than shorter ones.

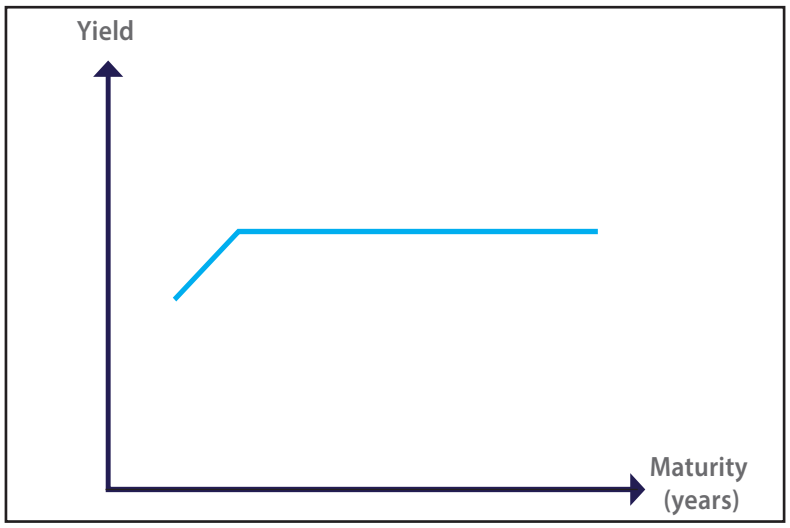
Inverted Yield Curve

When yields on shorter-dated bonds are higher than those on longer-dated ones, the yield curve is said to be inverted. This often occurs when the market expects interest rates to decline – typically if investors are concerned about short-term economic decline and low long-term growth, then they may prefer to purchase shorter-term bonds in order to secure assets with regular interest payments today. While an inverted yield curve does not directly forecast a recession, it is generally seen as a reliable indicator of one.



Flat Yield Curve

A flat yield curve occurs when short-term and long-term bonds offer similar yields. This can signal uncertainty in the market, since investors expect little difference in future interest rates or inflation.



A number of theories have been offered to explain the shape of the yield curve – for example, liquidity preference theory suggests that investors demand higher yields for longer maturities to compensate for reduced liquidity, while expectations theory posits that the shape of the yield curve reflects market expectations of future interest rates. As well as the normal and inverted shape, the yield curve can rise or fall steeply or become quite flat, depending upon yield expectations. Some central banks even look to control their own yield curve.

In a normal or inverted yield curve environment, GRY and NRY offer more comprehensive insights into a bond's true return, as these measures account for both the coupon payments and potential capital gains or losses. On the other hand, flat yield is most useful in a stable interest rate environment (ie, a flat yield curve), as there is little expectation of significant changes in future interest rates or inflation, so the coupon will be the primary source of return.

6.5 Macaulay Duration and Modified Duration

Learning Objective

4.6.6 Be able to analyse fixed income securities using: Macaulay duration; modified duration

6.5.1 Macaulay Duration

For bonds, cash flows at different points in time have varying sensitivities to interest rate movements (ie, different risks). A bond can be thought of as an amalgamation of these timed cash flows, each with its own sensitivity. Hence, the overall sensitivity of a bond to changes in rates must be a weighted average of the sensitivities of the individual cash flows. This is known as a bond's **Macaulay duration**, or simply duration.

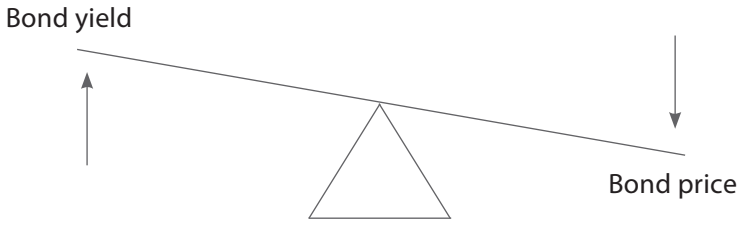
Duration is an estimate of the weighted average length of time to the receipt of a bond's benefits (coupon and redemption value), the weightings being the present value of the benefits involved.

It is therefore expressed in years: the higher the duration, the more sensitive the bond's price is to changes in interest rates.

The formula for duration is:

$$\frac{\Sigma \text{ (Net present value of the bond's cash flows x Time to cash flow being received)}}{\Sigma \text{ Net present value of the cash flows to be received}}$$

There is an inverse relationship between bond prices and yields: as yields rise, bond prices fall, and vice versa. Bond yields reflect the required rate of return (including a credit risk premium), which varies as interest rates move up and down.



The prices of bonds do not move to the same extent. The degree to which the price moves is determined by a number of other factors, including:

- **Coupon** – the smaller the coupon, the more the bond's price will move in response to interest rate changes. Therefore, low-coupon bonds are more volatile than higher-coupon bonds.
- **Time to redemption or remaining life** – the closer a bond is to maturity, the less sensitive its price will be to interest rate changes, due to the '**pull of maturity**'. As the board approaches its nominal value, price fluctuations from changes in interest rates become less significant.
- **Yield** – a bond's price sensitivity is influenced by its yield. The lower the yield, the more sensitive it will be to any changes in interest rates. For example, an increase in yields from 2% to 3% will have a greater proportionate effect than an increase from 5% to 6%.

Additional factors that may impact the degree a price moves include:

- the term structure and **convexity** of the yield curve
- the credit risk premium
- demand and supply dynamics
- any embedded options or early-redemption options (put/call), and
- the prevailing premium or discount to its nominal value.

Example

A 7% coupon bond has a GRY of 8% and a term of three years. Use this information to calculate its duration. To keep the calculation simple, we will assume that the interest is paid annually.

Firstly, we need to calculate the present value (PV) of the future cash flows on the bond. The present value is established by discounting the amount to be received by the rate of interest, which in our example is the GRY of 8%.

Year	Cash Flow		Discount Rate	Formula	Present Value
1	Interest	7.00	8%	$7.00 \div 1.08^1$	6.48
2	Interest	7.00	8%	$7.00 \div 1.08^2$	6.00
3	Interest	7.00	8%	$7.00 \div 1.08^3$	5.56
3	Redemption	100.00	8%	$100.00 \div 1.08^3$	79.38
Total		121.00			97.42

The sum of net present value (NPV) of the cash flows represents the current price of the bond. We then need to multiply each discounted cash flow by the number of years before the cash flow is received.

Year	Cash Flow	Present Value	No of Years	Present Value x Years
1	7.00	6.48	1	6.48
2	7.00	6.00	2	12.00
3	7.00	5.56	3	16.68
3	100.00	79.38	3	238.14
Total	121.00	97.42		273.30

We can then use the formula above to calculate the duration: 273.30 / 97.42 = 2.81 years. In other words, investors will need to wait 2.81 years for the payment of coupons and the return of principal.

6.5.2 Modified Duration

The Macaulay duration does not measure price sensitivity directly, but rather the weighted average time to receive the bond's cash flows. A more practical measure is **modified duration**, which quantifies how sensitive a bond is to changes in interest rates. The modified duration of a bond estimates how much a bond's price will change if there is a 100 basis points change in yields. A basis point is equal to 0.01%, so 100 basis points (or bps, pronounced 'bips') is to equal 1%.

The formula for calculating modified duration is:

$$\text{Modified duration} = \frac{-\text{Macaulay duration}}{1 + \text{GRY}}$$

The minus sign indicates the inverse relationship between bond prices and yields – as one rises, the other falls. As with duration, the higher the modified duration, the more sensitive a bond is to changes in its yield.

Example (continued)

Continuing with the example in section 6.5.1 of a three-year bond with a 7% annual coupon, GRY of 8% and a Macaulay duration of 2.81 years.

If the required yield were to increase by 1%, then from the modified duration formula, we can expect the price of the bond to fall: –2.81 / (1 + 0.08) = –2.60%.

Let's say that the price of the bond is 114. Theoretically, then, it should fall by 2.96 (ie, –2.60% x 114) to 111.04.

It should be noted that this is only an approximation of the impact. Macaulay and modified duration are not the most accurate forms of duration. To build an accurate picture, it is better to calculate the option adjusted duration (OAD) and the effects of the bond's convexity. The calculation of OAD and convexity is outside the scope of this workbook, so candidates are encouraged to carry out further reading if they wish to explore these concepts in more detail.

6.6 Bond Pricing Benchmarks

Learning Objective

4.6.7 Know the main bond pricing benchmarks and how they are applied to new bond issues

6.6.1 Spreads

Financial analysts and investment professionals pay close attention to spreads in the bond markets. A spread is simply the difference between the yield available on one instrument and the yield available elsewhere. It is usually expressed in basis points.

Spreads are commonly expressed as spreads over government bonds. For example, if a ten-year corporate bond yields 6% and the equivalent ten-year government bond yields 4.2%, then the spread over the government bond is 6% – 4.2% = 1.8% or 180 basis points. This spread will vary, mainly due to

the relative risk of the corporate bond compared to the government bond, so the spread for a riskier corporate issuer will be greater.

6.6.2 Benchmarks

At times of financial stress, the spread between benchmark interest rates (eg, SONIA, €STR or SOFR) and and the applicable base rates can widen dramatically. During the cost-of-living crisis, for example, this widening reflected heightened liquidity concerns, increased risk aversion and the growing uncertainty in financial markets – as central banks raised interest rates to combat inflation, banks became more cautious in their lending practices, leading to a higher premium on credit. This, in turn, contributed to greater borrowing costs for households and businesses, which further intensified the financial pressures on consumers already struggling with rising living expenses and supply chain disruptions.

The type of debt asset class generally determines the choice of pricing benchmark. However, specific features of a bond can mean that pricing off a benchmark security/rate becomes more difficult (in this context, 'pricing off' means determining the price or value of one instrument based on the price or value of another; eg, one bond versus another). For example, a ten-year corporate bond with a put/call feature is unlikely to price off the ten-year government bond, but rather a benchmark curve. This is because the corporate bond's maturity may not coincide with the maturity of the government bond due to the impact of the put/call feature.

6.6.3 Spread Over/Under Swap Rates

There is a very active market in exchanging floating rates for fixed rates in the so-called swaps market. Credit default swaps (CDSs), which are a form of insurance against the risk of borrowers defaulting on their debt, are some of the most actively traded instruments in the capital markets. The rates available on various swaps – for both corporate and government bonds – are also used as benchmarks to assess the yield on specific securities.

The swap spread is the difference between the ten-year government bond and the swap rate, which is the fixed rate on an interest rate swap (eg, SONIA, €STR or SOFR – see section 9.1 for more on interest rate swaps). Under normal market conditions, the ten-year government bond yield will be lower than the swap rate, reflecting the credit quality of the government bond versus that of the participants in the interbank credit markets.

In general terms, the swap spread is defined as the difference between the swap rate and yield of (on-the-run) government bonds of equal maturity. On-the-run means the most recent issuance of a US government bond, while 'off-the-run' refers to older issues that still trade in the secondary market.

6.6.4 Swap Spread Inversion

In the spring 2010, a rare occurrence took place in the US markets when the ten-year swap spread inverted. It was also reported by the Financial Times that, in the UK, the spread to gilts inverted in December of that year. One explanation for this unusual inversion focuses on the concern over the magnitude of government borrowing. The reasoning provided is that pension funds, for example, are matching assets and liabilities synthetically – ie, receiving a fixed rate through a swap contract rather

than by purchasing bonds. This could plausibly reflect concern over the supply deluge in government bonds and the effect this will have on yields.

6.7 Factors Influencing Bond Prices

Learning Objective

4.6.8 Be able to analyse the factors that influence bond pricing: gross redemption yield (GRY); credit rating; impact of interest rates; market liquidity; clean and dirty prices

6.7.1 Gross Redemption Yield (GRY)

As we saw in section 6.4.3, the GRY for a bond is a more accurate measure of its return than the simple flat yield, as it accounts for both the timing of coupon payments and the gain or loss that will occur if the bond is held to redemption. As such, GRY is more appropriate for long-term investors than the flat yield.

Also, because GRY ignores the impact of any taxation (hence the term 'gross'), it is particularly useful for non-taxpaying, long-term investors such as pension funds and charities.

The GRY is calculated using a discounted cash flow (DCF) approach, to determine the net present value (NPV) of all the cash flows generated by the bond during its lifetime. All cash flows are discounted at the appropriate interest rate, such as the prevailing short-term rate or base rate.

Another way of regarding the GRY is to consider it as the internal rate of return (IRR) of the bond. The IRR is simply the discount rate that, when applied to the bond's future cash flows equates to the current price of that bond.

Expressed in its simplest form, the GRY represents the IRR of the following:

- The **dirty price** paid to buy the bond (ie, the price which includes accrued interest but does not calculate it separately).
- The gross coupons received to redemption.
- The final redemption proceeds.

6.7.2 Credit Rating

Recall that bondholders face the risk that the issuer of the bond may default on their obligation to pay interest and the principal amount at redemption. Credit ratings give an indication of the scale of the risk and, when comparing similar bonds, the lower the credit rating the higher the return that investors will demand to compensate for the risk.

6.7.3 Impact of Interest Rates

Probably the most important risk to a bondholder is the impact of changing interest rates. This is due to the method of discounting future cash flows, at the prevailing rate of interest, to calculate the NPV of

the bond's cash flow and thereby arrive at the current bond price. As we saw in section 6.5.1, there is an inverse relationship between the price of a bond and the prevailing rate of interest.

Example

A bond issued with a 5% coupon will be less desirable as interest rates increase and new bonds are issued with higher coupon rates, (eg, with 6% coupons).

In simple terms, the price of the 5% bond in the secondary market will have to decline so that its GRY matches the GRY for the 6% bond. The way in which the lower coupon bond remains competitive in terms of GRY is by having a lower current price.

Duration and modified duration (volatility) are the means of measuring this risk more precisely.

6.7.4 Market Liquidity

During periods of market turmoil, difficulties can arise in the liquidity and trading conditions for bonds. In such conditions, investors typically have a preference for the most liquid instruments (eg, on-the-run bonds), which may force their price to deviate from normal levels relative to similar bonds with slightly different maturity dates. This misalignment can result in a breakdown in complex strategies that are designed to exploit the price differences (or spreads) across the yield curve – see section 6.4.5.

6.7.5 Clean and Dirty Prices

The market convention concerning the quoting of clean and dirty prices is as follows:

- **Clean price** – the price of a bond excluding the accrued interest. Most markets quote clean prices, but a price might be quoted which includes accrued interest.
- **Dirty price** – a price which includes accrued interest but does not calculate it separately.

In certain jurisdictions, such as in the UK, the accrued interest must be calculated separately for tax purposes – while accrued interest may be treated under income tax rules, capital value is subject to capital gains tax rules (which, in most cases will mean that it is exempt from tax). Under the actual/actual' day count convention, which is used for gilts, interest is calculated using the actual number of days of accrual, compared with the actual number of days in the period between coupon payments.

$$\text{Accrued interest} = \text{Nominal value} \times \left(1 / \text{n}\right) \times \text{Annual coupon} \times \left(\text{Days of accrual} / \text{Days in the coupon period}\right)$$

where n = the number of coupon payments in a year. For example, for a bond that pays quarterly, n = 4; semi-annually then n = 2; and annually then n = 1.

Note that the number of days in the period between coupon payments may range from 181 to 184 days, depending on the specific months in the period. There are also various day count conventions used in finance, each with different methods for calculating interest accrual – these are explored below.

The accrued interest adjustment depends on whether the bond is traded cum-interest or ex-interest.

In a cum-interest transaction, the accrued interest is added to the clean price. 'Days of accrual' in the above formula refers to the number of days from the day after the most recent coupon payment up to (and including) the transaction settlement date.

Example

A Cum-Interest Transaction

On 25 April, there is a transaction involving $100,000 of a 3% bond with interest payable on 15 January and 15 July. The clean price is $102. What is the total price paid by the purchaser?

- The coupon period runs from 16 January to 15 July = 181 days.
- As the bond pays semi-annually, n = 2.
- This particular bond settles at T+1, so the settlement date is 26 April.
- The accrual period runs from 16 January (15+1) through to 26 April (25+1) = 101 days.

Thus, accrued interest = 100,000 x (½ x 3%) x (101/181) = $837.02.

The total price is (£100,000 x 102/100) + 837.02 = $102,837.02.

In an ex-interest transaction, the accrued interest is referred to as rebate interest.

The rebate interest is deducted from the clean price. 'Days of accrual' in the above formula refers to the number of days from the day after the transaction settlement date up to and including the next coupon payment date.

Example

An Ex-Interest Transaction

On 3 October there is a transaction involving €60,000 of a 5.5% bond with interest payable on 8 October and 8 April. The clean price is €91. What is the total price paid by the purchaser?

- The coupon period runs from 9 April to 8 October = 183 days.
- As the bond pays semi-annually, n = 2.
- This particular bond settles at T+1, so the settlement date is 4 October.
- The accrual period starts the day after settlement (ie, from 5 October) through to 8 October, both days inclusive = 4 days.

Thus, accrued interest = 60,000 x (5.5%/2) x (4/183) = €36.07.

The total price is (60,000 x 91/100) – 36.07 = €54,563.93.

Day Count Conventions

As mentioned above, there are various day count conventions that determine how interest accrues over time, based on the number of days in a period. The most common day count conventions that affect the accrued interest calculation are:

- **Actual/360** (days per month, days per year) – the period 1 February to 1 April is considered to be 59 days (28 days for February, plus 31 days for March) divided by 360.
- **30/360** – each month is treated as having 30 days, so a period from 1 February to 1 April is considered to be 60 days. The year is considered to have 360 days. This convention is frequently chosen for ease of calculation: the payments tend to be regular and at predictable amounts.
- **Actual/365** – each month is treated normally, and the year is assumed to have 365 days, regardless of the leap year status. For example, a period from 1 February to 1 April is considered to be 59 days. This convention results in periods having slightly different lengths.
- **Actual/Actual (ACT/ACT) (1)** – each month is treated normally, and the year has the usual number of days. For example, a period from 1 February to 1 April is considered to be 59 days. In this convention, leap years do affect the final result.
- **Actual/Actual (ACT/ACT) (2)** – each month is treated normally, and the year is the number of days in the current coupon period multiplied by the number of coupons in a year, eg, if the coupon is payable 1 February and 1 August then on 1 April the number of days in the year is 362, ie, 181 (the number of days between 1 February and 1 August) x 2 (semi-annual).

6.8 Simple Interest Income on Corporate Debt

Learning Objective

4.6.10 Be able to calculate: simple interest income on corporate debt; conversion premiums on convertible bonds; flat yield; accrued interest (given details of the day count conventions)

6.8.1 Flat Yield

Recall from section 6.4.1 of this chapter that the simplest measure of return on a bond used is the flat yield, which is the coupon as a percentage of the bond's price.

$$\text{Flat yield}\ (\%) = \text{Coupon} / \text{Price}$$

6.8.2 Accrued Interest

From section 6.7.5 of this chapter, accrued interest is the interest that has been earned, but not paid. It is calculated by using the following formula below:

Accrued interest = Nominal value x 1/n x Annual coupon x (Days of accural / Days in the coupon period)

where n = the number of coupon payments in a year.

6.8.3 Conversion Premiums on Convertible Bonds

Convertible bonds give the holder the right, but not the obligation, to convert their bondholding into a predetermined number of ordinary shares of the issuer. The holder will choose to convert into shares if, at maturity, the value of the shares they can convert into exceeds the bond's redemption value. See section 7.1 of this chapter for more information on convertible bonds.

The formula for calculating the conversion premium is:

$$\text{Conversion ratio} = \frac{\text{Nominal value}}{\text{Conversion price of shares}}$$

7. Hybrid Investments

7.1 Convertible Bonds

Learning Objective

4.7.1 Be able to analyse investment characteristics, behaviours and risks associated with convertible bonds

Convertible bonds can be converted into the shares of the issuing company at an agreed-upon price by the holder (the conversion price) by a specified date (the conversion date). They give bondholders two possible choices:

- simply collect the interest payments and then receive repayment of the bond at maturity, or
- convert the bond into a pre-defined number of ordinary shares in the issuing company, on a set date or dates, or between a range of set dates, prior to the bond's maturity.

Because of the option to convert the bond into equity, they share some characteristics with bonds (eg, sensitivity to changes in interest rates) and some characteristics with shares (eg, responding to share price movements). Due to their combination of debt- and equity-like features, convertible bonds are hybrid securities, also known as hybrids.

Convertible bonds are often issued by companies and deployed as a form of deferred equity – ie, the issuer expects the bonds to be converted into shares at some point, thus raising capital without immediate dilution of existing shareholders. Note that governments could theoretically issue convertible bonds, but because governments do not issue shares, such bonds could be converted into other government securities; however, this structure is uncommon.

Typically, a convertible bond will pay a lower coupon than a conventional bond, because of the holder's option to convert the bond into equity, which offers the potential for greater capital appreciation. This conversion option compensates investors for the lower interest payments, as they can benefit from the upside potential of the company's equity if the share price rises above the conversion price.

Convertibles are often subordinated, meaning that all senior creditors must be settled in full before any payment can be made to holders in the event of insolvency.

	Advantages	Disadvantages
Investor	• If the company prospers, its share price will rise and, if it does so sufficiently, then conversion may lead to capital gains. • If the company hits problems, the investor will retain the bond. Interest will be earned; and, as bondholders, the investor would rank ahead of existing shareholders if the company went bust.	• There is the prospect of diluting of current shareholders' interests as convertible bondholders exercise their options. • If the company was seriously insolvent and the bond was unsecured, the bondholder might still not be repaid (however, this is a more remote possibility than that of a full loss as a shareholder).
Issuer	• Relatively cheap finance is acquired. Investors are willing to accept a lower coupon for a bond that is convertible because of the possibility of a capital gain. • Bond interest is a deductible expense for the issuing company.	• Convertible bonds dilute the company's earnings per share (EPS). • The company risks losing control, should investors convert their convertible bonds into shares.

Because there is this upside potential to the value of a convertible bond if the share price rises, and the downside protection of the redemption value if the shares do not perform well, convertible bonds generally trade at a premium to their share value, although this is not always the case (eg, during periods of market volatility or when interest rates rise significantly, which can reduce the bond's appeal). The conversion premium or discount is calculated as follows:

The conversion premium (or discount) is calculated as follows:

$$\text{Conversion premium or discount} = \frac{\text{Market price of covertible stock} - 1}{\text{Conversion ratio} \times \text{Market price of converible shares}}$$

The conversion ratio in the formula refers to the number of ordinary shares that will be received in exchange.

Given the share price, it is simple to calculate the conversion ratio:

$$\text{Conversion ratio} = \frac{\text{Nominal value}}{\text{Conversion price of shares}}$$

If the issuing company has a rights issue or bonus issue, then the conversion price will fall and the conversion ratio will increase by a corresponding amount (eg, halve and double respectively), depending on the number of new shares to be issued.

The calculation and its use can be seen by looking at the following example.

Example

A company has issued an 8% convertible loan stock at £100 nominal. This can be converted into the company's ordinary shares at a rate of 18 ordinary shares for every £100 nominal of the loan stock. If the loan stock is priced at £120 and the ordinary shares are priced at £5.75, the conversion premium (or discount) is: [120 / (18 x 5.75)] – 1 = 0.159 or 15.9%.

The result shows that the convertible is at a premium to the ordinary shares, so buying the convertible bond is a more expensive route than buying the ordinary shares directly. However, the 8% coupon currently being paid on the convertible bond may be sufficiently attractive, when compared to that being paid on the ordinary shares, to justify the premium.

The fact that the bonds are at a premium also indicates that it is not worth exercising the option to convert into ordinary shares. This can be seen by simply comparing the respective values of the shares as follows:

Shares	Nominal	Price	Market
Convertible bond	100	£1.20	£120.00
Ordinary shares	18	£5.75	£103.50

When considering whether to convert into shares, an investor should assess both the potential for capital gains and the impact on the income they receive. The bond's fixed coupon (especially if higher than the dividend yield on the share – 8% in the above example) may be attractive. However, if the bond is priced at a premium (as in this case), then the investor must weigh whether the premium is justified by the bond's income or potential capital gains. Conversion would result in the loss of the bond's coupon payments, and a shift to more variable and potentially lower dividend income, depending on the company's performance. Investors should also consider the tax implications of converting, as bond interest and dividends may be taxed differently.

If the price of the convertible stands at a discount to the price of the ordinary shares, then it is a less expensive way of buying into the company's ordinary shares or worth converting. Continuing with the above example, if the bond is priced at £110 and the shares are priced at £6.75 then it is worth converting, as seen below.

Shares	Nominal	Price	Market
Convertible bond	100	£1.10	£110.00
Ordinary shares	18	£6.75	£121.50

The higher the premium, the more the convertible loan stock will behave like a conventional stock, whereas the lower the premium, the nearer the loan stock will be to conversion, and therefore the closer its price movements will be to that of the company's equity.

7.1.1 Conditional/Contingent Convertible Bonds (CoCos)

Conditional or contingent convertible bonds (also known as CoCos) are similar to traditional convertible bonds, but with one key difference: conversion is triggered by specific conditions – for example, the underlying equity share price reaching a set level. In other words, conversion is contingent on meeting a predefined event.

CoCos are especially useful to the banking industry, as they provide a flexible mechanism for increasing a bank's capital in times of financial stress. The trigger event for CoCos issued by banks may be a breach of a regulatory capital ratio, particularly the Common Equity Tier 1 (CET1) ratio – this ratio measures the bank's core capital relative to its risk-weighted assets, and therefore banks are required to keep it above a certain threshold. In this event, the CoCo automatically converts into equity. When this happens, the bank's capital base is uplifted, thus enabling the bank to avoid insolvency and support financial stability. CoCos therefore are an important tool for mitigating risk during periods of economic downturn or stress.

7.2 Mezzanine Financing

Learning Objective

4.7.2 Know the main investment characteristics, behaviours and risks associated with mezzanine finance

Mezzanine financing is a combination of debt and equity financing that fills the gap between senior debt and equity in a company. It gives investors the right to convert the debt into an equity interest in the company. Companies use mezzanine financing to achieve goals that require capital beyond what senior lenders will extend.

7.2.1 How it Works

The regular form of mezzanine financing is through unsecured debt and preferred stocks. Mezzanine financing is usually unsecured, so carries high risks. As a result, investors expect a higher rate of return than secured lenders – typically between 10% and 30% a year, although this figure can vary based on the risk profile of the investment, the company's financial health, market conditions and the specific terms of the deal.

In terms of its ranking, it is senior to equity, but subordinate to pure debt.

An added feature of mezzanine issues is that it often includes a convertible option or warrant, which provides investors with the right to convert debt into equity. However, the conversion generally results in some dilution of existing equity.

7.2.2 Advantages of Mezzanine Finance

For Issuers	For investors
• **Lower cost of capital** – Issuing mezzanine debt is less expensive than issuing equity in terms of the overall cost of capital. • **Flexible use of funds** – Companies use mezzanine finance for a wide range of purposes (eg, for recapitalisation of an existing business, management buyouts, or expansion). • **Growth potential** – Mezzanine finance can support faster growth compared to relying solely on senior debt. • **Payment flexibility** – In some cases, payment-in-kind (PIK) interest allows interest to accrue instead of being paid in cash, thus providing the company with additional cash flow. • **No principal repayment until maturity** – Mezzanine finance often has deferred payments of principal, thus allowing the company to use the funds for growth before needing to repay the loans.	• **Higher returns** – Mezzanine financing offers higher rates of interest due to the higher risk associated with the debt. • **Shareholder benefits** – If the issuer becomes successful, then investors may have the opportunity to exercise the equity option and receive the shareholder benefits (eg, dividends and capital appreciation). • **Potential for equity upside** – It often includes options to convert the debt into equity (via warrants or convertible bonds), giving the potential for capital to appreciate if the company performs well. • **Tax deductibility** – Interest payments received can be tax deductible for the business, which may increase the financial stability of the issuing company and, by extension, the likelihood of timely payments to investors.

7.2.3 Disdvantages of Mezzanine Finance

For Issuers	For investors
• **Higher interest rates –** Since mezzanine financing is unsecured, it carries higher interest rates compared to secured debt. • **Fees** – Arrangers of mezzanine financing often charge fees, which further increase the overall cost. • **Equity conversion** – If mezzanine debt includes conversion options, there is a potential for equity dilution when the debt converts into shares. This reduces the ownership stake of existing shareholders, which may be undesirable, particularly for the company's management. • **Higher leverage** – Issuing mezzanine debt increases the company's overall debt levels, which could negatively affect its credit rating. This could make it more expensive or difficult for the company to access future financing. • **Debt repayment at maturity** – While principal payments are typically deferred, the full repayment at the maturity can create strain on the company's finances. This could lead to financial difficulties or default if cash flow is insufficient. • **Operational restrictions** – Lenders may impose covenants or restrictions on the company's activities to protect their investment. These covenants could limit the company's ability to take certain actions (eg, acquiring other businesses or taking on more debt), which could restrict operational flexibility.	• **Interest payment deferral** – If the issuer cannot make a scheduled interest payment, then some or all of the interest may be deferred or paid in kind (PIK). • **PIK interest** – Any PIK interest is added to the principal amount, which increases the total burden and is paid in full at maturity. This could strain the issuer's financial capacity and delay cash flows to investors. • **Higher risk of default** – As mezzanine debt is subordinated to senior debt, there is a greater risk that investors may not be paid out if the company defaults, especially in a distress scenario. • **Limited control** – Investors may have limited control over the company's operations since they are typically not involved in day-to-day management, and the debt structure is more passive. • **Equity dilution –** While the convertible feature can be attractive, it can also lead to dilution of investors' own positions if the company issues additional shares upon conversion. • **Arrangement fees –** Investors generally pay an arrangement fee upon closing the transaction, which can add to their overall cost.

8. Derivatives

Learning Objective

4.8.1 Know the characteristics of: options; warrants; futures; forwards

Derivatives are financial instruments whose value is derived from the price of an underlying asset such as equities, bonds, commodities and currencies. The value of a derivative is influenced by factors such as the spot price of the underlying asset, as well as additional variables such as interest rates and time to maturity. The most common types of derivatives are options, warrants, futures and forwards., which we will consider in the following sections.

Some derivatives, such as futures and options, are standardised contracts with fixed terms so they can be traded on an exchange; hence, they are referred to as exchange-traded derivatives (ETDs) or on-exchange derivatives.

OTC (or off-exchange) derivatives such as forwards, on the other hand, are customisable agreements that are negotiated privately between parties. This flexibility has led to the OTC market becoming far larger in terms of notional value of contracts traded. OTC derivatives are heavily used for risk management, speculation and arbitrage, as they can be tailored to meet the specific needs of the parties involved. As a result, there is considerably less visibility in the terms of OTC derivatives, as these terms will change from contract to contract.

8.1 Options

An option is a contract that gives the buyer the right, but not the obligation, to buy or sell a particular asset at a specified price, on or before a specified date. Conversely, the seller of the option assumes an obligation regarding the underlying asset when the option is exercised.

Options are available on a variety of underlying assets including physical assets (eg, crude oil and sugar) and financial assets (eg, cash, shares, bonds and foreign currency). They may also be tied to the current cash price, an over-the-counter (OTC) forward agreement, or a futures contract (where the underlying asset is a future – see section 8.3), in which case they are known as options on futures.

Investors who use options to place directional bets are known as speculators, but options can also be used to hedge existing positions. As options are versatile trading and risk management tools, they offer an extremely broad array of strategies for investors and portfolio/fund managers with varying views on market direction and volatility, and with differing appetites for risk.

8.1.1 Options Terminology

- **Call option** – an option to buy an underlying asset.
- **Put option** – an option to sell an underlying asset for a specified price on or before a specified date.
- **Long** – the buyer of an options contract. Also called the holder or owner of the contract.
- **Short** – the seller of an options contract. Also called the writer of the contract.

- **Premium** – the cost of the option to the buyer. Premiums are non-returnable and are paid by the holder to the writer.
- **Strike price** – the price at which the option can be exercised. Also called 'strike', for short, and exercise price.
- **Underlying asset** – the asset that the option contract gives the holder the right to buy or sell. Also called 'underlying', for short.
- **Intrinsic value (IV)** – the amount by which an option is profitable if it were exercised today; in other words, the difference between the strike price and the underlying asset price.
- **Extrinsic value** – the difference between an option's premium and its intrinsic value.
- **In-the-money (ITM)** – a situation where an option that possesses intrinsic value. For a call option, this means the strike is below the underlying asset price; and for a put option, the strike is above it.
- **At-the-money (ATM)** – a situation where an option's strike is the same as the prevailing market prices of the underlying asset.
- **Out-of-the-money (OTM)** – a situation where an option that does not possess intrinsic value, only extrinsic value. For a call option, this means that the strike is above the underlying asset price; and for a put option, the strike is below it. An OTM option has no intrinsic value, only extrinsic value.

The exercise style of an option describes how it may be exercised:

- **American-style** – an option that the holder can exercise on any day during its life.
- **European-style** – an option that can be exercised on its expiry day only.
- **Asian-style** – an option whose payoff depends on the average price of the underlying asset over a certain period of time, rather than the price at maturity, as per American- and European-style options.
- **Bermudan-style** – an option that can be exercised on pre-determined dates before expiry, usually once a month. Such options are a combination of American- and European-styles, thus they are hybrid securities.

8.1.2 Uses of Options

Investors use options for a variety of purposes, including:

- **Hedging** – As a risk management tool, options can be used to protect positions from adverse price movements. For example, a position in a commodity or security may be hedged using options to mitigate the risk of unfavourable price changes.
- **Arbitrage** – This involves taking advantage of price discrepancies between different markets or related assets. By buying and selling the same (or equivalent) options in different markets, it is possible to profit from differences in pricing without taking on significant risk.
- **Speculation** – By buying options, it is possible to benefit from price changes while limiting the risk to the premium paid for the option (in other words, directional betting on the movement of an asset's price).
- **Income generation** – Options can also be used to generate income. For example, selling call options on an asset that is already owned can produce a premium income, while agreeing to potentially sell the asset at a specified price if the option is exercised.

8.2 Warrants

A warrant gives its holder the right to buy (call warrant) or sell (put warrant) company's shares over the life of the warrant at a fixed **strike (or exercise) price**. The strike price is usually set at a premium to the current market price for a call warrant, or a discount for a put warrant, at the time the warrant is issued. Warrants are often issued by the company whose shares are underlying the warrant, or by a third-party entity.

Warrants are commonly attached to a corporate bond but, unlike convertible bonds, the bond itself remains outstanding even if the warrant is exercised. They can also be attached to preferred stock, to attract investors. The attachment of a warrant is seen as an inducement and usually allows the issuer to pay a lower coupon.

Equity warrants are very similar to equity options in that both give the holder the right to buy a set amount of a company's shares over a specified time frame at a predefined price, and indeed the terminology for warrants is the same as for options (see section 8.1.1). However, there are key differences: while equity options are traded on public exchanges and the seller is usually not the issuing company, most warrants are privately traded, with the company itself as the most common issuer. Note that warrants are traded on some financial markets, such as the Deutsche Börse and the Hong Kong Exchange and Clearing (HKEX).

The lower coupon that is paid on a corporate bond with a warrant attached reflects the premium that the investor pays for the warrant (the equivalent of an option's premium). It allows the investor/speculator to take a view on the company's shares, and profit if their price rises over the warrant's life. Until the warrant is exercised, its holder is not entitled to receive any dividend that the company might pay.

Warrant certificates specify the details of the investment tool that they represent. All warrants have a specified expiry date (the last day the rights of a warrant can be exercised). The underlying instrument that the warrant represents is also stated on the certificate. A warrant typically corresponds to a specific number of shares, but it can also represent a commodity, index or currency.

Similarly to convertible bonds (see section 7.1), warrants have a conversion ratio, which indicates the number of warrants needed to buy or sell one investment unit. For example, if the conversion ratio to buy an individual share is 3:1, this means that the holder needs three warrants to purchase one share. Usually, if the conversion ratio is high, the price of the share will be low, and vice versa.

In the case of equity warrants, corporate actions (such as rights issues, share splits, bonus issues, **share buybacks**, or takeovers and mergers) may result in adjustments to the conversion ratio and strike price. These adjustments ensure that investors are neither disadvantaged nor gain undue benefit from changes in equity.

8.3 Futures

A future is a legal agreement between two parties to make or take delivery of a specific quantity and quality of a specified asset on a fixed future date at a price agreed today. Futures can be based on a wide range of assets including commodities and financial instruments (eg, interest rates, bonds, exchange

rates and stock market indices). They are often referred to futures contracts because they are traded on organised exchanges.

The terms of each contract are standardised in a legal document called the contract specification. This standardisation is necessary because it would not be financially viable for an exchange to tailor each contract to every **trader/investor's** requirements. The aim of the contract specifications is to allow participants to take positions on general price movements in any given market. Contract specification also promotes transparency across all users of the exchange. (Note that while standardisation is attractive to many market participants, the demand for flexibility is a key factor in the popularity of the OTC market.)

For example, the Chicago Board of Trade (CBOT) trades wheat futures, where the full-sized contract is based on a set of specific wheat grades and the specific quantity is 5,000 bushels (ie, each individual contract represents 5,000 bushels of wheat). Here, the specified asset is wheat, but what are the exact quality and type?

The contract specification provides precise details about what is acceptable under the terms of each contract. For example, the CBOT's wheat futures contract specifies that the grain must be a specific deliverable grade, a list of which is set out by the exchange. It also specifies acceptable delivery methods including the names of storage facilities or warehouses to which delivery must be made. The price is agreed between the buyer and the seller, and this is the only element of the futures contract that is open to negotiation; however, the exchange does specify the minimum permitted movement in price, known as the full **tick** size, and the method of quotation.

Futures are quoted on a 'per unit' basis. For example, in the case of wheat futures, the full tick size is 0.25 of a cent ($0.0025) per bushel. Because each contract represents 5,000 bushels, the value of the minimum price movement per contract (the full **tick value**) is $12.50 per contract.

The fixed future date is determined by the exchange. Although it is a set day within a specific month, the fixed future date is often referred to as the contract month. For wheat futures traded on the CBOT, for example, the delivery months are March, May, July, September and December.

For all futures contracts, the contract specification standardises the futures product and, as long as the contracts have a common underlying asset and a common delivery date, the contract is said to be fungible (ie, identical to) and substitutable with others traded on the same exchange. For example, all March long gilt futures on ICE Futures Europe, London are fungible. A March long gilt future on ICE Futures, London is not fungible with a June long gilt future on the same exchange, because the delivery dates are different.

The consequences of standardisation and fungibility are:

- contracts are easy to trade as they have set terms, and
- the concentration of activity provides liquidity, as measured by volume.

The fungible nature of contracts also means that a trader/investor can remove any delivery obligations by taking an equal and opposite position. For example, a trader who has bought a future and is required to buy a specified quantity of the underlying asset can simply sell a fungible future. The result is that

they have agreed to both buy and sell the same item at the same future date. The trader/investor is described as having exited the trade or closed out their position.

If they do not close out their position before the contract's delivery date, then they will be obligated to take or make delivery of the underlying asset (depending on whether they are long or short respectively). This is referred to as 'holding the position to expiration' or 'settling the contract' by physical delivery or cash settlement, depending on the terms and type of the contract – eg, financial futures can only be settled in cash (not physically), because they have no physical form.

8.3.1 How Do Futures Work?

Futures positions are opened by going long (buying) or short (selling). By opening either a long or short futures position, the trader/investor becomes exposed to changes in the futures price, and the position will incur profits or losses as a result of the movement in price. Holding the contract to expiry will oblige the trader to meet the delivery obligations. If the price of the asset rises, then the futures buyer (long position) will make a profit. The trader/investor will take delivery at the lower price and be able to sell the asset in the cash market at the higher price. Conversely, if the price is lower than the agreed price, the futures seller, or the short position will make a profit.

8.3.2 Uses of Futures

Futures can be used for hedging, arbitrage and speculation, much like options (see section 8.1.2).

They can also facilitate portfolio diversification, by providing exposure to different asset classes that may otherwise not be accessible or easily traded in the spot market.

Additionally, futures can be used for cash flow management if a portfolio/fund manager anticipates a known cash flow on a future date. Using futures allows them to lock in prices now, thereby mitigating potential price fluctuations and ensure more predictable outcomes.

8.4 Forwards

Forwards are very similar to futures contracts, as they are similarly legally binding agreements to make or take delivery of a specified quantity of a specific asset at a future date, at a price agreed today. They are also settled only on the delivery date. Thus, forwards can also be used for the same purposes as futures (see section 8.3.2).

However, unlike futures:

- Forwards are customisable, hence they are usually traded OTC, usually with banks or investment firms. This customisation allows the terms of the contract (eg, asset type, quantity, delivery date and price) to be tailored to the specific needs of the parties involved.
- Forwards are typically not marked to market daily (ie, they are not subject to daily margin calls or adjustments in value), and if they are, then the resulting profits are not paid out until maturity.

Example

The London Metal Exchange (LME) lists various contracts, including their monthly average contracts. In the physical markets (where physical delivery is common), an airline might use forward prices on jet fuel to lock in one of their major costs. They would agree on a price today for delivery in a future month. The LME trades and clears futures on both ferrous and precious metals, as well as a range of average price futures and options for certain non-ferrous metals, such as copper, lead and tin. While these types of contracts are attractive to many hedgers, a steel forward allows a construction company to lock in the price of steel today – which is a major input cost – when submitting a bid for a building project. In this case, the OTC steel forward is not subject to the daily margin requirements that are typical of exchange-traded contracts (such as futures), which reduces the cash management burden that is associated with holding a long-term position in futures.

Outright forwards are a common product traded in the foreign exchange (FX) market. Companies, institutional investors and banks themselves use forwards to manage their FX transaction risks. If an organisation is importing or exporting goods (or investing) in another currency, they can use forwards to protect against adverse currency movements.

Forward contracts are also used to lock in the price of physical commodities, such as energy, metals and foodstuffs.

8.4.1 Advantages and Disadvantages of Forwards

The main advantages of forwards compared with futures are:

- Forwards are more flexible (eg, size, date, specific grade, quality, or delivery point).
- They have a wider range of underlying product.
- They are available from most commercial banks.

The main disadvantages are:

- Forwards have less liquidity as they are traded OTC, making them harder to buy and sell.
- As there is no central clearing, forwards carry higher levels of counterparty and default risk.
- They are subject to less regulation, with fewer regulatory controls.

8.4.2 Uses of Forwards

Forwards can be used for the same purposes as futures (see section 8.3.2).

8.4.3 Delta

Learning Objective

4.8.2 Understand common value drivers for derivative instruments: delta; gamma; theta; vega

One of the factors which can change an option's premium during its lifetime is movement in the price of the underlying asset. However, the premium does not always move by the same amount as the underlying asset.

The delta of an option is a measure of the sensitivity of the option's price to changes in the price of the underlying. Simplistically, it can be calculated by measuring the change in an option premium brought about by a small change in the price of the underlying asset. This calculation would be done using option pricing models such as Black-Scholes. In simple terms:

$$\text{Delta } (\Delta) = \frac{\text{Change in option premium}}{\text{Change in price of underlying asset}}$$

For example, if the change in price of the underlying was 20p, and the option increased by 12p, this would give a delta of 12/20 = 0.6.

The delta will lie somewhere between 0 and 1:

- A delta of 0 means that the premium is totally insensitive to small changes in the price of the underlying; this is typically the case for options that are far out-of-the-money (OTM).
- A delta of 1 means that the premium will change by exactly the same monetary amount as the underlying; this is typical for options that are deep in-the-money (ITM). The underlying physical asset and futures will also always have a delta of 1.
- Generally, an at-the-money (ATM) option will have a delta of approximately 0.5.

The sign of the delta enables us to distinguish between call and put options:

- Call deltas are positive because the premium will rise when the price of the underlying rises (eg, an ATM call option will have a delta of approximately +0.5).
- Put deltas are negative because the premium will fall when the price of the underlying rises (eg, an ATM put option will have a delta of approximately -0.5).

Example

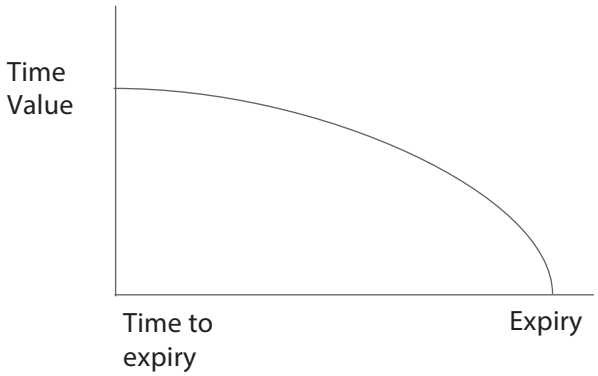
ABC plc's share price is 575. The 625 call (ie, a call option with a strike of 625) has delta of 0.30 and a premium of 26. The 525 put has a delta of –0.30 and a premium of 24. If the share price rises to 585, using delta we can approximate the new call and put premiums.

The share price has risen by 10.

The delta of the call is 0.30, so the change in premium will be 10 x 0.3 = 3 (ie, the call premium will rise from 26 to 29).

The delta of the put is –0.30, so the change in premium will be 10 x (–0.30) = –3 (ie, the put premium will fall from 24 to 21).

As an OTM option approaches its expiration, its delta will tend towards zero. The longer to expiration, the slower the decline in delta, However, as the option's expiry date gets closer, the change in the delta will accelerate.



Summary of Deltas

Instrument	Delta
Physical assets or future of a deep ITM call	+1
ATM call	+0.5
Far OTM call or a far OTM put	0
ATM put	–0.5
Deep ITM put	–1

Delta Value of Cumulative Positions

Deltas can also be used to measure the sensitivity of a portfolio containing futures, underlyings assets, calls and puts. The delta calculated for such a portfolio is referred to as the cumulative delta. In order to measure the cumulative delta of a combined portfolio, the deltas of the individual positions within it need to be added together. The cumulative delta reflects the overall sensitivity and directional bias of a portfolio. The directional bias is obtained by taking account of positions (+) and short positions.

This is best illustrated by looking at an example.

Example

Investor A is short an ATM put.

The net delta position is (–1) x (–0.5) = +0.5

This is determined by taking the number of positions (1) and assigning a negative sign because it is a short position. This -1 is then multiplied by the delta of an ATM put, which is -0.5.

The result of +0.5 indicates that for every 1-point increase in the underlying asset's price, then the value of Investor A's position will increase by 5. Therefore, if the underlying price rises by 10, then Investor A's position would improve by 5 (ie, 10 x 0.5). This is because the price of the put decreases, resulting in a profit on the short position.

Conversely, if the underlying price falls, then the position would increase a loss as the price of the put increases.

8.4.4 Gamma

Gamma is the measure of how delta changes (the rate of change of delta) with respect to movements in the price of the underlying asset. In other words, it measures how much delta will change as the price of the underlying asset moves.

Gamma is small when the option is either deep ITM or far OTM. It is largest when the option is ATM, especially when the option is close to expiry.

Traders/investors closely monitor gamma as it affects option pricing. Short-dated ATM options are more volatile than longer-dated ones, and these volatility differences may present trading opportunities. Asset managers also use gamma in their dynamic hedging strategies, where they aim to maintain a delta-neutral portfolio. However, because gamma influences delta, the portfolio may need frequent rebalancing to adjust for changes in the delta due to gamma's effects.

Since gamma measures the change in delta, it determines the adjustments needed for any hedges associated with a single option's position or a portfolio of options. For option holders, an increase in gamma usually signals a profitable opportunity: as the price of the underlying moves, then the option's delta will change, which allows the holder to adjust the hedge and potentially profit. For example, if an investor has a long call option on a stock, as the underlying's price rises then the option's delta will increase (as measured by gamma), and the investor can sell the adjustment (or change to delta) at a higher price.

Therefore, a long position in an option or a net long position of options will have positive gamma (benefitting from price moves in the underlying). Conversely, short options or a net short position of options will have negative gamma, meaning that the investor would need to make larger adjustments as the price of the underlying moves.

8.4.5 Vega

Vega measures how a 1% change in implied volatility affects an option's price.

Vega is always positive for long options positions (both calls and puts), and it is greatest for ATM options. As an option to move further ITM or OTM, its vega decreases.

Vega can change even if there is no significant change in the movements of the underlying asset's price; it is affected by any change in expected volatility.

Vega is useful since it measures an option's or option portfolio's sensitivity to both market sentiment (expected volatility) and current market conditions. Many traders/investors use vega as a key indicator of their options positions' profitability – when they are delta neutral they are trading on an asset's volatility (not price direction); so, vega helps them to assess how well their positions are performing relative to changes in volatility.

8.4.6 Theta

Theta measures the rate of decline of an option's value due to the passage of time. Specifically, it represents how much the fair value will decrease as one day passes (assuming that the underlying asset's price remains unchanged).

Theta also represents the time decay on an option's value (ie, the erosion of the option's value as time passes). As an option approaches its expiration, its value decreases (all else being equal). The closer an option gets to maturity, the more time decay accelerates. This is a key risk for option holders, as options can only be exercised for a limited period or on a specific date.

Theta and Option Positions

- Long calls and long puts always have negative theta (ie, they lose value over time).
- Short calls and short puts always have positive theta (ie, they gain value over time).

Theta is highest for ATM options, and gradually decreases as an option moves either ITM or OTM. As expiration approaches, theta increases sharply, particularly if volatility is also decreasing; this can severely undermine a long option holder's position. Theta is higher when either volatility is lower (since the likelihood of large price movements becomes lower, and therefore it is less likely that the option will move significantly ITM) or there are fewer days until expiration (since there is less opportunity for the underlying asset to move in a way that benefits the option holder.

Traders/investors use theta is used as a factor in combination with gamma and vega in determining trading strategies. As expiration nears, theta increases as a percentage of an option's value – this makes

it more advantageous for traders/investors to sell their options that are nearing expiration, rather than those with longer durations, especially when volatility (vega) is declining.

8.5 Volatility

Learning Objective

4.8.3 Know the characteristics and relevant application of historic volatility; implied volatility; the Chicago Board Option Exchange's volatility index (VIX)

8.5.1 Types of Volatility

There are three main types of volatility to consider when evaluating options:

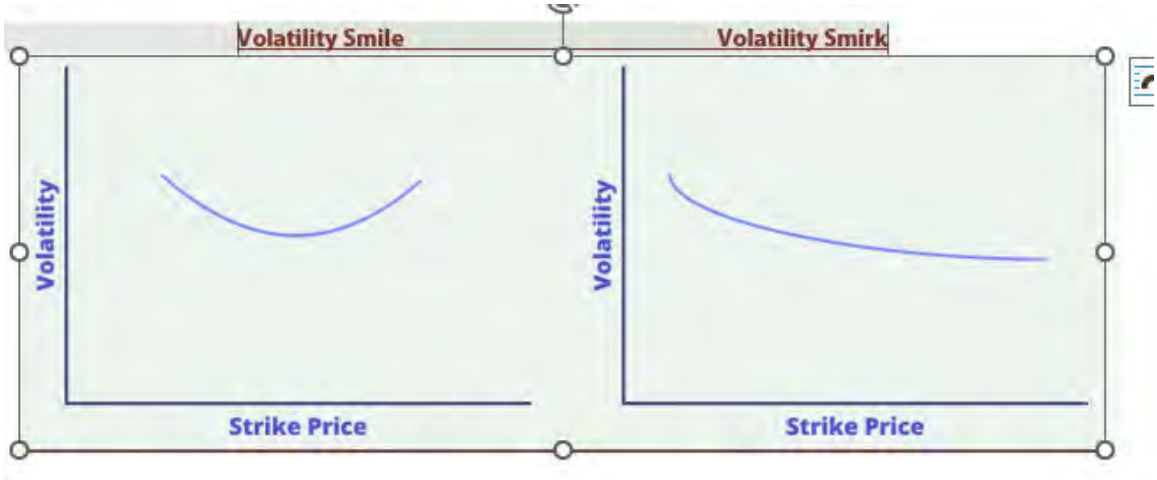
1. **Historic volatility** – this measures how volatile an asset has been in the past. It can be measured precisely because we know what the price movements have been; however, it is only of limited use in pricing options, because past volatility does not guarantee future price movements.
2. **Future volatility** – in pricing an option, or deciding whether an option is worth buying or selling, it would be incredibly useful to know what the underlying asset's future volatility would be. Unfortunately, it is not possible to predict future volatility with certainty.
3. **Implied volatility** – as it is impossible to predict future volatility, traders/investors must effectively take an implicit view on what they think it might be. By buying and selling options, the market forms a collective view on what they expect to happen in the future.

The actual figure for implied volatility is derived from options pricing models. Perhaps the best known of these is the Black-Scholes model, which was developed by American economists Fischer Black and Myron Scholes in 1973. Pricing models such as this one require inputs such as volatility, strike price, underlying price, time to expiry and cost of carry in order to compute the premium. If the current option premium is known, the model adjusts the volatility figure (while keeping the other factors fixed) until the premium calculated by the model is the same as the current price in the market. In other words, by working backwards through the model, it is possible to calculate the volatility implied by the premium. This is essentially a 'reverse-engineering' process to determine the implied volatility.

Different option pricing models are better suited to particular situations. For example, the Black-Scholes model can only be used to price European-style options, as it assumes that the option will only be exercised at expiration, with no possibility for early exercise. In contrast, the binomial pricing model is more appropriate for pricing American-style options, as it accounts for the possibility of early exercise (see section 8.1.1 of this chapter for definitions of option types).

Another model is the Stochastic Alpha, Beta, Rho (SABR) pricing model, which works on a different premise: it uses varying levels of implied volatility to price options on the same underlying asset. Its pricing basis is the 'volatility smile', which is a U-shaped curve that reflects higher implied volatility for options that are deep OTM compared to ATM options. This means that the implied volatility used to price an option is greater for those with strike prices significantly different from the underlying asset's cash price, either ITM or OTM. In some markets, particularly in equities, a 'volatility smirk' may be

observed instead, where implied volatility is higher for OTM puts than for calls, thus reflecting market participants' expectations of greater downside risk.

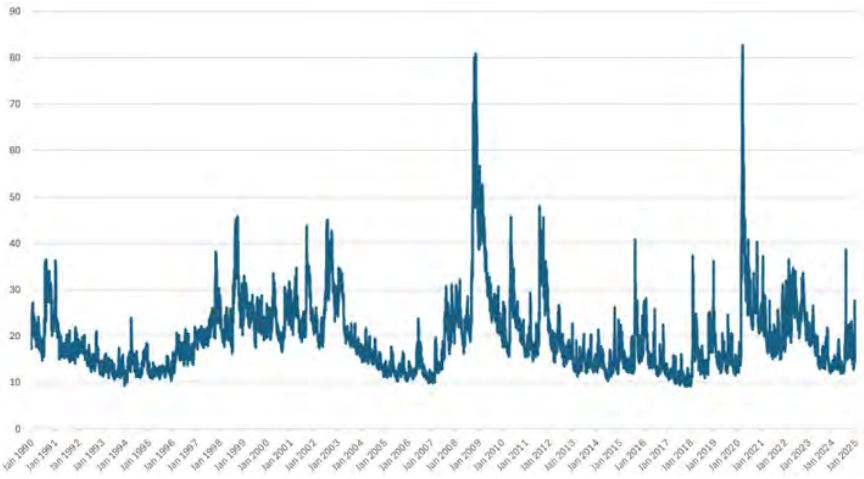


Pricing models also need adjustments to account for the differences between options on futures and options on actual underlying assets. For example, futures options are typically settled in cash, rather than through delivery of the underlying asset, which affects how their pricing is modelled. Additionally, for equity-based options, adjustments must be made to factor in dividends, since dividend payments can influence the underlying asset's price and, therefore, the option's value.

8.5.2 VIX

From a macroeconomic perspective, there are ways of measuring the degree of volatility across a broad range of asset classes. One of the most widely used is the Chicago Board Options Exchange (CBOE)'s volatility index, or VIX, which measures the short-term (30-day) implied volatility of S&P 500 options. Since detailed daily records of the VIX have been available since 1990, it provides a valuable long-term view of the market's perception of risk and future volatility.

VIX from January 1995 to January 2025



Source: Cboe[1]

As can be seen, the VIX itself is highly volatile, showing that perceptions about the future volatility can change dramatically with respect to shifting market conditions, news events and crises.

The peak in October 2008 shows the extreme panic during the global financial crisis, when implied volatility surged. The more recent spike in March 2020 coincided with the onset of the COVID-19 pandemic, thus showing another period of heighted uncertainty.

The more volatile an asset's price, the greater the uncertainty; thus, the higher the time value (TV), and consequently its premium. If the price of an asset is prone to large movements, holders have a higher chance of making a profit, while writers face higher risk. Volatility, therefore, significantly impacts option premiums because of its effect on the TV and overall pricing.

9. Swaps

Learning Objective

4.9.1 Know the purpose, key characteristics, benefits, costs and valuation of: interest rate swaps and swaptions; types of swap agreements: vanilla, basis, coupon, index and currency; interest calculations (compared to bond markets); quality spread differentials; foreign exchange forwards and swaps; equity forwards, swaps and swaptions (volatility, bullet and variance)

A swap is a financial agreement between two parties to exchange cash flows or financial instruments over a set period of time. There are many different types of swaps available, with different structures, terms and underlying assets.

Swaps are commonly used to manage or hedge financial risks. For example, a company might want to switch from a variable interest rate on its loan to a fixed one, to avoid the risk of rising interest rates.

1 Cboe, January 2025. VIX. Retrieved from https://www.cboe.com/tradable_products/vix/ (Accessed: January 2025)

Swaps can be customised to fit the specific needs of the parties involved, and as such, they are typically traded OTC.

9.1 Interest Rate Swaps (IRSs) and Swaptions

9.1.1 Interest Rate Swaps

An interest rate swap (IRS) is an agreement between two parties to periodically exchange a series of interest payments in the same currency, usually to manage or reduce the cost of borrowing.

IRSs are cash-settled contracts for difference (CFDs), which are financial derivatives that allow parties to settle the difference in the value of an underlying asset (or, in this case, the interest rate differential). As such, the notional loan principal (upon which the swap is based) is never exchanged. IRSs can be used for both new and existing borrowing, with terms up to 25 years.

Interest rate swaps take several forms:

- **Vanilla swap** – the most commonly traded and most liquid type of interest rate swap, where a fixed rate is exchanged for floating (or variable) rate. Also known as a fixed-to-floating swap or coupon.
- **Basic swap** – one type of floating rate is exchanged for another type of floating rate. Also known as a floating-to-floating swap.
- **Fixed-rate swap** – exchanging one type of fixed rate into another type of fixed rate. Also known as a fixed-to-fixed swap.

Example

Company A is embarking on a three-year project to build and equip a new manufacturing plant and borrows funds to finance the cost. Because of its size and credit status, it has to borrow at floating rates.

It can reasonably estimate what additional returns its new plant will generate but, because variability of the interest payments exposes it to the risk that rising interest rates could make the project uneconomic.

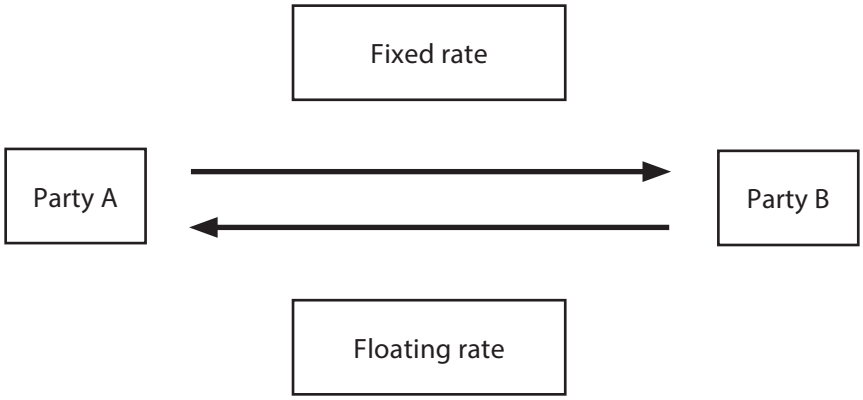
If the company could secure fixed-rate finance, it could mitigate the risk variations and more accurately predict the returns it can make from its investment. To do this, Company A could enter into an interest rate swap with an investment bank.

As part of the swap, it pays a fixed rate to the investment bank; and in exchange, it receives an amount of interest calculated on a variable rate. With the amount it receives from the investment bank, it then has the funds to settle its variable rate lending.

In this way, Company A has hedged its interest rate exposure risk.

The two exchanges of cash flow are known as the legs of the swap, and the amounts to be exchanged are calculated by reference to a notional amount. The notional amount in the above example is the amount that Company A has borrowed to fund its project.

Typically, one party will pay an amount based on a fixed rate to the other party, who will pay back an amount of interest based on a floating rate (eg, SONIA, €STR or SOFR). The floating rate will usually be set as the variable rate plus, say, 0.5% and will be reset quarterly:



9.1.2 Interest Rate Swaptions

An interest rate swaption is an arrangement where a buyer pays an upfront sum for the right to enter into an interest rate swap agreement (ie, to exchange fixed interest rate payments for floating rate payments, or vice versa) by a pre-agreed date in the future – essentially, a combination of a swap and an option, hence the name. The concept is the same as we saw for options in section 8.1 of this chapter.

9.2 Currency Swaps

Currency swaps are simply interest rate swaps made in two different currencies that require an exchange of the loan principal at the beginning and at the end of the swap period.

The exchange rate at which the loan principal is swapped is agreed upon at the outset. As a result of this exchange of principal, the credit risks between the parties are higher than for a single currency interest rate swap.

Currency swaps are mainly used as a hedging tool rather than for speculation and arbitrage.

9.3 FX Forwards and swaps

A forward contract is an agreement between two parties to agree now the rate at which a certain amount of foreign currency will be exchanged on a set future date; thus, the key advantage of forward contracts is the certainty that they provide regarding the exchange rate. These contracts are quoted OTC by banks. The rate at which the two currencies will be exchanged in the future – known as the **forward rate** – is derived by adjusting the **spot rate** to reflect the interest rate differential between them.

9.3.1 FX Forwards

There are two main types of FX transaction:

- **FX spot market** – this involves the exchange of two currencies nearly immediately after the transaction date. In the wholesale market, the standard settlement is T+2 (ie, two business days after the trade).
- **FX forwards** – these are transactions where the exchange rate is agreed today, but settlement occurs at a future date. Any FX contract with a maturity date beyond the normal spot settlement of T+2 is considered a forward contract. For major currencies, forwards (also known as outright forwards) can have maturities ranging from a few days to ten years, although the longer the maturity, the less liquid the market.

As mentioned above, the key advantage of forward contracts is the certainty that they offer regarding the exchange rate.

As well as commercial users, the forward market is used extensively by speculators, such as hedge funds and proprietary trading desks at investment banks. Since forward rates are influenced by the interest rate differential between the two currencies, the FX forward market is used to speculate on expected changes in the difference between these two interest rates. This is done using FX swaps.

9.3.2 FX Swaps

An FX swap involves simultaneously buying one currency at the spot rate and selling it at a future date at a pre-agreed forward rate. Profits or losses in such trades are driven by movements in the forward points, which reflect changes in the interest rate differential.

FX swaps therefore differ from currency swaps in that FX swaps are short-term contracts where only the principal is exchanged (not interest payments) at a rate determined by the interest rate differential between the two currencies; hence, they are used for liquidity management and short-term hedging. In contrast, currency swaps involve the exchange of both principal and interest over a longer period, and are typically for hedging or financing purposes.

Quality Spread Differentials (QSD)

In an FX swap, the two parties will usually have different credit ratings; it follows that one will have a higher credit rating than the other. As a result, the interest rates that they pay can also be based on their creditworthiness. The quality spread differential (QSD), which reflects the creditworthiness gap between them (and is therefore used to gauge default risk), is calculated by subtracting the contracted market rate from the rate available to them on comparable financial instruments.

QSDs are most commonly associated with FX swaps, although the concept can also apply to other financial instruments and transactions where credit risk plays a role.

9.4 Equity Forwards, Swaps and Swaptions

Equity forwards and swaps are agreements between two parties (eg, an institutional investor and a bank) to exchange payments based on a notional principal amount. One set of these payments is linked to the total return on an equity index, while the other is usually linked to a fixed or floating rate of interest (although it can also be tied to the return on another equity index).

9.4.1 Equity Forwards

Equity forwards involve a single payment or exchange of the underlying asset at a future date (ie, they settle at a single point in time). While they are based on a notional principal, no principal is actually exchanged between the two parties; instead, the contract focuses on the difference between the return of the underlying equity index and the agreed-upon rate.

An example of an equity forward contract could involve a party agreeing to exchange the return of the US S&P 500 index for a fixed interest rate over a six-month period. At the end of the six months, the investor either receives or pays the difference between the S&P 500 return and the agreed-upon interest rate. This return could either be positive or negative, depending on the performance of the index.

For example, if the S&P 500 index has a return of 5% over six months and the agreed-upon interest rate is 3%, then the investor will receive the 2% difference. Conversely, if the index return is -2%, then the investor would need to pay the 5% difference (ie, the negative return plus the agreed-upon rate).

Advantages of equity forwards include:

- Hedging equity exposure without the need to directly hold the underlying stocks.
- Customisation of contract terms, thus offering flexibility in settlement dates and interest rates.
- Access to forwards equity markets without the complexity of direct cross-border investments.
- No upfront capital requirements, as only the final difference between the equity return and the agreed rate is settled at maturity.

However, if the return on the equity index is negative, the investor will be required to make a payment to cover the negative return, in addition to any interest payments due. The payment is only made at the contract's settlement date, but the investor is exposed to market fluctuations and potential losses in the interim.

9.4.1 Equity Swaps

In contrast to equity forwards, equity swaps involve a series of periodic payments.

An equity swap may be a vanilla swap based on a single currency or a cross-currency swap based on two different currencies. Being cash settled, no principal is exchanged between the counterparties, only payments representing costs associated with two sides of the transaction.

An example of a vanilla equity swap could involve Japan's Nikkei 225 index, with payments tied to an interest rate such as the Tokyo overnight average rate (TONA or TONIA). This is similar to the party receiving the return on the UK's FTSE 100, and funding that equity exposure through a sterling cash deposit.

Advantages of equity swaps include:

- Gaining equity exposure without the costs of buying and holding equities.
- Facilitating index tracking.
- Facilitating access to illiquid markets that may be otherwise inaccessible to foreign investors.
- Permitting a longer-term exposure than would be possible using ETDs.

However, similarly to an equity forward, if the return on the equity index is negative in any period, then the investor will be required to make both an interest payment and an additional payment to cover this negative return. These payments are made periodically throughout the life of the swap, though, not just at settlement.

Alternatively, a cross-currency equity swap can be used to gain exposure to an overseas equity market, again by swapping the return on that market for a fixed or floating rate of interest. For example, a US investor could enter into a cross-currency swap to gain exposure to the German DAX index, while exchanging the DAX returns for a euro-denominated interest rate.

9.4.3 Equity Swaptions

An equity swaption is similar to an interest rate swaption (as described in section 9.1.2), but instead of entering into an interest rate swap agreement, a buyer pays an upfront sum for the right to enter into an equity swap agreement by a pre-agreed date in the future. The buyer then has the right, but not the obligation, to enter into the equity swap.

9.5 Index Swaps

Index swaps are very similar to equity swaps, in that both involve exchanging cash flows based on the performance of an underlying index, with one party receiving the total return of the index (including price changes and dividends) and the other paying a fixed or floating rate.

However, while equity swaps specifically reference equity indices (eg, the FTSE 100 or the S&P 500), index swaps can refer to swaps based on a broader range of indices, including bond or commodity indices.

Example

In a commodity index swap, one party might agree to receive the return on a commodity price index (eg, Bloomberg Commodity Index) while paying a fixed rate. The receiving party benefits from any increase in commodity prices over the life of the swap, while the paying party benefits from a fixed payment. This type of index swap allows the parties to hedge against commodity price fluctuations or gain exposure to commodity markets, without physically owning the commodities themselves.

9.6 Volatility, Variance and Bullet Swaps

The various types of swaps covered so far are focused on exchanging cash flows based on interest rates or asset returns. In contrast, volatility, variance and bullet swaps are more specialised instruments since they are designed to provide exposure to specific market risks (rather than simple cash flow exchanges). We will now consider volatility, variance and bullet swaps in turn.

9.6.1 Volatility Swaps

Unlike traditional equity swaps (where the exchange of cash flows are based on fixed or floating interest rates), volatility swaps are based on volatility, as their name suggests. These swaps only provide investors with exposure to the volatility of an underlying asset such as a stock index, an interest rate or an exchange rate; there is no directional underlying risk, meaning that there is no exposure to the asset's price movement. If an investor thinks volatility will increase, they will buy a volatility swap; otherwise, if they think volatility will decrease, they will sell a volatility swap.

Volatility swaps are pay-off-based instruments (ie, the pay-off is determined by the difference between the actual volatility of the asset and the agreed-upon level of volatility, known as the 'volatility strike'). This strike is set at the contract's inception, and reflects market expectations. The pay-off of a volatility swap is calculated by multiplying the notional value of the swap by the difference between the actual volatility and volatility strike:

$$\text{Pay-off} = \text{Notional value} \times (\text{Actual volatility} - \text{Volatility strike})$$

If the actual volatility differs from the volatility strike, then the pay-off is realised. A higher actual volatility compared to the strike results in a positive pay-off, while a lower actual volatility results in a negative one.

Example

A trader enters into a volatility swap on China's SSE Composite Index, with a contract notional value of 200,000 yuan and a maturity of 12 months. The volatility strike is set at 20% (ie, the level of volatility agreed upon at the inception of the contract). However, after 12 months, the volatility turns out to be 30%. Hence, the pay-off is 200,000 yuan (ie, 200,000 x (30% - 20%)).

This demonstrates that any significant jumps in the price of the underlying asset can produce unexpected results for the parties involved in the swap.

9.6.2 Variance Swaps

Variance swaps are similar to volatility swaps, in that both are pure plays on an underlying asset's volatility. However, the key difference lies in how volatility and variance are used: a volatility swap is a forward contract on future actual price **volatility**, while a variance swap is a forward contract on

future actual price variance (where variance is the square of volatility). Because of this, the pay-off for a variance swap will be larger than that of a volatility swap for the same underlying asset.

At the end of the contract, the pay-off of a variance swap is calculated by multiplying the notional value of the swap by the difference between the actual price variance and the fixed amount of variance agreed upon at the time of the contract:

Pay-off = Notional value x (Actual variance – Variance strike)

Example

A trader enters into a variance swap on the S&P 500 index, with a notional value of $1 million and a variance strike of 100 (which represents an expected volatility of 10%).

Upon maturity, the actual volatility of the S&P 500 turns out to be 15%. Hence, the actual variance is 225 (ie, 152 = 225, since variance is the square of volatility). The pay-off that the trader receives is therefore $125,000 (ie, $1 million x (225 – 100)).

9.6.3 Bullet Swaps

As already mentioned, in a traditional swap, the two parties agree to exchange a series of periodic payments between one another, based on a notional principal amount. In a bullet swap, however, no regular cash flows take place throughout the life of the swap. Instead, both parties of the swap agree to make a single payment at the maturity date.

9.6.4 Interest Calculation

Accrued interest on a swap is calculated in the same way as for bonds, and the same system of day count conventions is used (see section 6.7.5 of this chapter). There are, however, some crucial differences.

For example, while bonds are discounted using the same rate for each cash flow, this is not the case for swaps. At the time that the swap agreement is entered into, the total value of the fixed rate flows and the value of the expected floating rate payments will be equal. However, as forward expectations of the floating rate change, so will the fixed rate that investors demand when they enter into new swaps. Thus, the discount rate used to calculate the present value of each cash flow in a swap is subject to change over time.

Additionally, swaps do not have level coupons. Rather, the magnitude of the coupon depends on the accrual convention, and the business day adjustment rules stated in the contract.

The fixed leg of the swap is the easiest to value, since the coupons do not need to be estimated. For the floating leg, the coupons must be determined from the prevailing yield curve. Each cash flow is then discounted in a similar way to pricing a conventional bond, and the sum of the present values of the payments gives the dirty price of each leg (ie, the total value of the cash flows, including any accrued interest – see section 6.7.5 on clean and dirty prices).

Example

A bank sells a three-year swap that pays a fixed rate of 0.95% a year, with a principal of €1,000,000, on 18 June. The fixed coupons are paid on 1 June, and the floating coupons on 1 June and 1 December. Calculate the net value of the swap, using the discount rates provided.

As the swap is denominated in euros, the annual 30/360 day count convention is used for the fixed leg, and the semi-annual Actual/360 is used for the floating leg.

Fixed Leg

Year	Cash Flow		Discount Rate	Present Value
1	Interest	9,500	0.9996	9,496.20
2	Interest	9,500	0.9988	9,488.60
3	Interest	9,500	0.9963	9,464.85
3	Redemption	1,000,000	0.9963	996,300.00
Total		**1,028,500**		**1,024,749.65**

The dirty price of the fixed leg of the swap is €1,024,749.65. There are 18 days between the last coupon payment (1 June) and the settlement date (19 June). Using a 30/360 day count convention, all months are assumed to have 30 days and all years are assumed to have 360 days. From this:

Accrued interest = €9,500 x 18/360 = €475

Clean price = €1,024,749.65 – €475.00 = €1,024,274.65.

Example cont'd

Floating Leg

Year	Cash Flow		Discount Rate	Present Value
0.5	Interest	1,962.17	0.9998	1,961.78
1	Interest	2,249.72	0.9996	2,248.82
1.5	Interest	2,262.08	0.9993	2,260.50
2	Interest	1,179.33	0.9988	1,177.91
2.5	Interest	1,179.33	0.9978	1,176.74
3	Interest	3,240.61	0.9963	3,228.62
3	Redemption	1,000,000	0.9963	996,300.00
Total		**1,028,500**		**1,008,354.37**

The dirty price of the floating leg is €1,008,354.37. Again, there are 18 days between the last coupon payment and the settlement date. Using an Actual/360 day count convention, the denominator is the actual number of days in the current coupon period – as the current coupon period began on 1 June and ends on 1 December, there are 182 days in the period. From this:

Accrued interest = €1,962.17 x 18/182 = €194.06

Clean price = €1,008,354.37 – €194.06 = €1,008,160.31.

Net Value of the Swap

The net value of the swap is simply the difference between the present values of the two legs. Based on the clean price, the net value is: €1,024,274.65 – €1,008,160.31 = €16,114.34. Note that as the seller of the swap, the bank is the fixed leg payer.

10. Corporate Actions

Learning Objective

4.4.1 Understand the purpose and structure of corporate actions and their implications for investors: stock capitalisation or consolidation; stock and cash dividends; rights issues; open offers, offers for subscription and offers for sale; placings

A corporate action is an event that affects the capital structure of a company. The most direct impact of corporate actions is on shareholders, as shares represent part-ownership in the company. However, they can also affect bondholders, as changes to the company's capital structure (eg, debt issuance, restructuring or mergers) can impact the value and terms of the company's bonds.

There are many different types of corporate action, and they can be classified into three types:

- **Mandatory** – one that is mandated by the company, not requiring any intervention from the shareholders or bondholders themselves. The most obvious example of a mandatory corporate action is the dividend payment, since all shareholders automatically receive the dividend.
- **Mandatory with options** – an action with some default option that will occur unless the shareholder intervenes. However, until the date at which the default option occurs, shareholders are given the opportunity to select an alternative option. An example of a 'mandatory with options' corporate action is a rights issue, which is considered in section 10.3 below.
- **Voluntary** – an action that requires the shareholder to make a decision. An example is a takeover bid: if the company is being acquired, each individual shareholder must decide to accept the offer or not.

These classifications are the ones used by the **European Central Securities Depository Association (ECSDA)**. Other countries often use the simpler distinction of mandatory and voluntary (ie, a mandatory with options event then becomes a voluntary event, followed by a separate mandatory event), but this does not change the nature of the corporate action event itself.

10.1 Cash Dividends

The board of directors undertakes day-to-day management of a company, and their power extends to determining whether a dividend can be paid. The board determines whether the company is sufficiently profitable to pay a dividend and, if so, how much. They then present a resolution to the ordinary shareholders, requesting approval to the proposed dividend, and the ordinary shareholders then vote on whether to accept or reject the resolution.

It should be noted, therefore, that ordinary shareholders participate in profits by way of dividends, but that they do not have an automatic right to a dividend; the decision to pay dividends is ultimately at the board's discretion. However, the board must operate within certain legal constraints that limit their ability to pay dividends, as outlined in the following sections.

10.1.1 Realised and Unrealised Profits

To ensure that a company's assets are not depleted at the expense of the creditors, company law restricts the type of profit that can be distributed to shareholders.

Profits and losses can be divided into two types: realised and unrealised.

- **Realised profit** refers to profits arising from a completed transaction. For example, if a company sells an asset, then it will make (or realise) a profit or a loss from that sale. Net realised profits can be distributed as dividends.

  Dividends from realised profit can be covered or uncovered:

  - A covered dividend is a payment made from this year's profit.
  - An uncovered dividend is a payment made by the company where an insufficient profit has been made in the current financial year to cover the dividend payment.

  See section 3.6.3 of chapter 3 on dividend cover. In the UK, the Companies Acts allow companies to pay dividends from profits earned in previous years, which are shown as reserves on the company's

statement of financial position. Additionally, a public company has to cover net losses, whether realised or not, using realised profits before paying a dividend.

- **Unrealised profits** arise from increases in the value of assets that have not yet been sold. For example, if a company buys a building, and its value increases over time, then the profits from that increase is unrealised until the building is sold. This type of profit is sometimes referred to as a 'book profit', as it reflects a theoretical gain recorded on the company's financial statements. Unrealised profits cannot be distributed as dividends.

10.1.2 Timing and Frequency

Companies must also follow specific rules and guidelines regarding the timing and frequency of dividends. The frequency with which companies pay dividends varies, with some paying one dividend a year, some two and others four:

- If only one dividend is paid, it is typically the final dividend for the full financial year.
- If more than one dividend is paid, the earlier dividends are called interim dividends and the last dividend is called a final dividend.
- The interim dividend is paid after the results for the first six months of a company's financial year have been announced.
- Before declaring an interim dividend, the directors must ensure that the company's financial position supports the payment of such a dividend from profits available for distribution (ie, realised profits).
- The final dividend is paid after the accounts, along with the dividend for the full financial year, have been approved at the AGM.

Dividend procedures are typically published annually by stock exchanges or regulatory bodies to document the defined process that companies must follow when paying dividends. For example, in the UK, the London Stock Exchange (LSE) provides this information.

There are three key dates in the payment of dividends for registered securities:

- **Record date** is the day on which the company closes its share register for the purpose of the payment of dividends, and is sometimes known as the 'books closed date'. In other words, the company will pay the dividend to those persons recorded as shareholders on the register on the record date. Companies should aim to pay straightforward cash dividends within 30 business days of the record date.
- **Ex-dividend date** is the date on which the shares trade without the right to the next dividend payment; they are said to be ex-dividend (xd).

  The basic principle is that the xd date typically falls a few days before the record date, with many markets setting it two business days earlier. For example, in the UK, the xd date normally falls on a Wednesday, with the associated record date falling two business days later (usually on Fridays). Further, the dividend must be declared via a primary information provider (PIP) or notified to the exchange at least six business days before the proposed record date; otherwise, the xd date will be deferred until the following week (unless otherwise agreed by the exchange).

  Prior to the xd date, the shares are said to be trading cum-dividend. The amount of the dividend is announced several days before the xd day; and in theory, the share price should fall by the dividend amount on the xd date.

- **Payment date** is the day on which shareholders receive the dividend, either by cheque or bank transfer.

As shares are continually changing hands, the share register inevitably lags behind the actual trading of the shares, which is why a defined process and well-established timetable are in place for dividend payments. This ensures that investors (both buyers and sellers) know exactly what their entitlements are and avoids confusion. For purchases and sales close to the record day, though, there may be doubt as to whether the transfer will be recorded on the share register in time. To address this, the stock exchange will declare the shares ex-dividend several days before the record date.

Example

A company determines that it intends to pay a dividend shortly before the end of the year. To ensure that it can pay the dividend within the recommended 30 day deadline, it announces the dividend using the following schedule:

Announcement date: Thursday 17 November

Ex-dividend date: Wednesday 23 November

Record date: Friday 25 November

Cash dividends reduce a company's cash reserves, which can raise concerns among bondholders about the company's ability to meet its debt obligations. If the dividend payout is seen as excessive or unsustainable, then bondholders may worry about the company's financial stability, leading to lower bond prices.

10.1.3 Stock Dividends

A company may choose to provide alternatives for how the dividend is paid in lieu of paying a cash dividend. Some of the main types of dividend alternatives are scrip dividends and dividend reinvestment plans (DRIPs).

Scrip Dividends

Instead of distributing dividends to shareholders as a cash payment, a company may choose to pay the dividend instead in the form of new shares in the company, called a scrip or stock dividend. The company may offer investors a certain number of new shares for each share they already hold, based on the share price and the dividend per share. This can be calculated as follows:

$$\text{Stock dividend ratio} = \text{Share price} \ / \ \text{Dividend per share}$$

Example

A company has a share price of 200p and pays a dividend of 8p per share. If the company were to offer a scrip dividend, it might offer shareholders one new share for every 25 shares that they hold (ie, 200p / 8p).

If an investor holds 10,000 shares, they may take a cash dividend of £800 (ie, 10,000 x £0.08) or they may take 400 new shares (£10,000/25). At a price of 200p per share, the new shares would also be worth £800.

Scrip dividends offer advantages for both shareholders and the company. For shareholders, they allow the acquisition of new shares without incurring dealing costs. For the company, they improve cash flow by retaining the cash that would otherwise have been used to pay the dividend.

In terms of tax, shareholders are taxed on the cash equivalent of the dividend (ie, there is no tax advantage). If a shareholder accepts the scrip alternative, the following tax consequences apply:

- **Income tax:**
  - The grossed-up amount of the cash dividend still counts as taxable income for the shareholder.
  - A basic rate taxpayer will have no further tax liability, and non-taxpayers cannot reclaim the tax credit.
  - Higher and additional rate taxpayers will have to pay additional tax, as with a cash dividend.
- **Capital gains tax (CGT):**
  - Providing that the market value of the shares on the first day of trading is not more than 15% different from the cash dividend, the cash dividend is used as the acquisition price for CGT purposes. For example, if the dividend is €5 per share, and the market value on the first day of trading is €5.50 (ie, a 10% increase), then the acquisition price for CGT purposes is €5.
  - If the 15% rule is breached, then the market value on the first day of trading is used as the CGT base cost. Continuing with our example, if the market value on the first day of trading is €6.50 (ie, a 30% increase), then the acquisition price for CGT purposes becomes €6.50.
- The rules are designed to promote consistency and fairness in how CGT is calculated, while also preventing manipulation of CGT by shareholders.

As a scrip dividend is offered as an alternative to the cash dividend, the company must ask shareholders if they wish to take it up. This involves sending a letter to the shareholders requesting them to return it within a deadline if they want to take up the scrip dividend offer. If the letter is not returned, the shareholder will receive a cash dividend instead.

Dividend Reinvestment Plan (DRIP)

A DRIP is a variation on this theme. Under a DRIP, however, the company makes a cash payment to all shareholders but offers them the choice of using the cash to buy additional shares on their behalf in the market.

DRIPs differ from scrip issues in the following ways:

Scrip Dividend	DRIPS
• New shares are issued by the company, and the cash that would otherwise be used for the dividend is retained within the company. • The company issues newly created shares to those shareholders who elect to receive their dividend in this way. • It can take up to one week for the shares to be added to a portfolio. • A scrip dividend dilutes existing shareholdings as new shares are issued.	• The company pays the full amount of the cash dividend. • The company uses the cash dividend to buy shares in the market and passes on the benefit of the lower commission rates it can negotiate for a bulk purchase. • It can take up to three weeks for the shares to be added to a portfolio. • A DRIP does not dilute existing shareholdings as the shares required are purchased in the market.

Both scrip dividends and DRIPs can be carried out in CREST. The new shares will be recorded in the shareholder's account, and the company registrar will update the shareholders' register accordingly.

Stock dividends do not affect a company's cash flow, so they do not directly impact a company's ability to service debt. However, bondholders might view the dilution negatively, as it could signal weaker shareholder value or reduced future profits. On the other hand, if the company has a strong financial position, then stock dividends may have a neutral or even positive impact on bond prices.

10.2 Bonus Issues, Share Splits and Consolidations

From time to time, companies may decide to issue additional shares to existing shareholders or change the nominal value of ordinary shares. The former is a bonus issue and the latter a consolidation. Alternatively, companies may choose to subdivide their shares, known as a share split.

10.2.1 Bonus Issues

Occasionally, a company may issue new shares to its existing shareholders without requiring any payment (meaning that the company is not raising any further capital), often as a public relations exercise to accompany news of a recent success or as a means to make its shares more marketable. The number of shares issued is based on the holdings of each shareholder on record date.

This issuance is usually referred to as a bonus issue (also known as a **capitalisation issue** or scrip issue; however, the term 'scrip issue' should not be confused with 'scrip dividend', as they are entirely different actions).

A bonus issue involves the company converting reserves (which may have arisen from the accumulation of undistributed profits or from the premium received from new shares in the past) into share capital. These newly issued shares rank ***pari passu*** (ie, the same in all respects) with those already in issue and are distributed to the company's ordinary shareholders in proportion to their existing shareholdings free of charge.

Once a company's share price rises significantly, its marketability can suffer as potential investors may shy away from purchasing the shares at a higher price. Therefore, a reduction in a company's share price (often through a bonus issue) can improve marketability. This may, in turn, result in the share price settling above its new theoretical level, and the company's market capitalisation increasing slightly. The share price level at which investors start to get nervous varies from one country to another – in the UK, for example, share prices that enter double-digit territory can often reduce investor interest; in the US, on the other hand, it is not uncommon for companies to trade at three-digit prices (or even higher) as the market there is generally more accustomed to such levels.

Bonus issues typically do not affect the company's cash flow or debt levels directly. However, they might raise concerns for bondholders about the company's future ability to service debt or its overall financial health. For example, the issuance of bonus shares could signal a lack of cash reserves or indicate that the company is struggling to find other ways to reward shareholders. This could lead to a negative reaction in bond prices.

10.2.2 Share Split

An alternative to a scrip issue to reduce a share price is to have a **share split** (also known as a stock split or subdivision) whereby each existing share is split into a greater number of shares with a lower nominal value.

Example

A company with shares having a $3 nominal value and a $15 market price have a share split whereby each $3 share is divided into five shares, each with a nominal value of $0.60. In theory, the market price of each new share should be $30 (ie, $150/5).

It might appear as though there is little difference between a bonus issue and a subdivision, but a bonus issue does not affect the nominal value of the company's shares.

While bondholders are generally unlikely to be directly affected by a share split, their market perception may be affected. If investors view it as a strategy to increase liquidity or reduce volatility, then it could have a neutral or mildly positive effect on bond prices. Conversely, if seen as an attempt to mask underlying financial issues, bond prices may fall due to increased perceived risk.

10.2.3 Consolidation

Alternatively, a company may consider a consolidation if it wants to raise more equity from existing shareholders. In a consolidation, the company decreases the number of shares in circulation by combining them, with each share having a higher nominal value. Hence, it is the reverse of a share split, which is why it is also known as a reverse split

Example

A company has €0.50 NV ordinary shares in issue, which are trading at a share price of €0.10. After deciding to consolidate 10 shares into one, the market price of each new share should then be €1 (ie, €0.10 x 10) and the shares become €5 NV ordinary shares.

New shares typically cannot be issued at less than their nominal value (eg, under companies law in the UK), which can present a challenge when a company wants to raise new capital. This issue becomes particularly relevant when the company's share price has fallen significantly, causing the nominal value of its shares to be or even below the market price. In such cases, issuing new shares at a discount to the current market price may not be feasible, as doing so would violate the rule that shares cannot be sold for less than their nominal value.

Additionally, a very low share price can have a dampening effect on investor confidence. Investors may perceive a low share price as a sign of financial distress, poor company performance or a lack of growth potential. It can also make investors fear that the company is not viable or that the share price could continue to fall further. Further, very low-priced shares are often seen as speculative or high-risk investments, which may deter long-term institutional investors or even more conservative individual investors who are looking for stability and growth potential.

A consolidation can help to address this issue by increasing the nominal value of each share, thereby raising the share price to a level where new shares can be issued at a reasonable price. By reducing the number of shares in circulation, the company can effectively raise the value of each remaining share. This also makes it possible for the company to proceed with other forms of equity financing (eg, a rights issue, see section 10.3) which, in turn, allows the company to offer new shares to existing shareholders at a price above the nominal value, while still providing a discount to the market price – thus making it an attractive proposition for investors.

Example (continued)

Continuing with our example, the company's share price falls significantly, such that it is now trading at €0.05 per share. In this case, the company is unable to issue new shares, as this price is below the share's nominal value of €0.50.

To resolve this, the company can opt for a share consolidation. By consolidating 10 shares into one, this will increase the share price to €1 and the nominal value to €5. While the new share price is still below the new nominal value (and, therefore, the company is still unable to issue new shares), this action helps to position the company for future equity financing (eg, a rights issue) as it has made the shares more marketable to investors.

Had the company simply conducted a rights issue without the consolidation, then:

1. investors may have been deterred by the very low share price of €0.05, and therefore are unlikely to have exercised their share entitlement under the rights issue, and
2. it would have been difficult for the company to issue shares at a discount to the market price (as per the purpose of a rights issue), thus limiting the amount of capital that it could raise.

10.3 Rights Issues

A rights issue is where a company offers existing investors the right to subscribe to additional new shares at a discount to the market price at the time of announcement. When a company wishes to raise further equity capital (whether to finance expansion, develop a new product or replace existing borrowings), it can make a rights issue to its existing ordinary shareholders. Similar to a bonus issue (covered in section 10.2.1), these newly issued shares rank *pari passu* with those already in issue.

The rights issue is accompanied by a prospectus, which outlines the purpose of the capital-raising exercise, but does not require an advertisement of the issue to be placed in the national press. New shares are offered in proportion to each shareholder's existing shareholding, at a price discounted to the market price, thus ensuring that the issue will be fully subscribed and often to avoid the cost of underwriting the shares.

The number of new shares issued and the price of these shares will be determined by the amount of capital that the company seeks to raise. Recall that this price must be above the nominal value of the shares already in issue.

The choices open to shareholders under a rights issue are as follows:

- **Take up the rights in full**, by purchasing all of the shares offered. This option may appeal to shareholders who wish to maintain or increase their stake in the company and are able to commit the required funds.
- **Sell all of the rights** on to another investor. The rights entitlement is transferable (often described as renounceable), and has value because it enables the purchase of shares at a discounted price. Shareholders might choose this option if they do not want to increase their stake in the company, but wish to benefit financially from the rights issue.
- **Sell some of the rights** and use the proceeds to take up the balance (an approach sometimes known as tail-swallowing). This option may be attractive if the shareholder wants to increase their holding in the company, but does not have enough cash to fully cover the purchase.
- **Take no action and allow the rights to lapse**, which means that the company will sell the rights on behalf of the shareholder and distribute any proceeds to them. This is often the most economical way to proceed for smaller shareholders who do not wish to increase their stake in the company.

A rights issue can impact bonds by altering the company's capital structure. If the rights issue raises equity and reduces debt, then it can improve the company's financial stability, thus making its bonds less risky and potentially increasing bond prices. However, if the rights issue is perceived as a sign of financial distress (such as a desperate attempt to raise capital), bondholders may become concerned about the company's creditworthiness, potentially leading to a decline in the bond price or a downgrade in the company's credit rating.

10.4 Open Offers

An open offer is a method of raising new capital that is similar to a rights issue. It is another type of secondary market offering, whereby a company seeks to raise new capital from its existing shareholders.

Similarly to a rights issue, an open offer invites shareholders to buy new shares at a price below (ie, at a discount to) the current market price.

Unlike a rights issue, though, the entitlement to an open offer cannot be sold or transferred. Therefore, if the shareholder decides not to take up the entitlement, then it lapses. For these shareholders, open offers lead to a dilution in value for non-accepting shareholders; hence the listing rules limit the discount to a maximum of 10%.

In a standard open offer, shareholders cannot apply for more than their pro-rata entitlement. However, the issue can be structured to allow shareholders to apply for more than their entitlement, with the possibility of being scaled back if the offer is oversubscribed. Further, an open offer can be structured as an 'open offer with compensation', where any shares not taken up are sold in the market and the proceeds distributed to non-participating shareholders.

If the capital raised in an open offer is used to reduce debt or strengthen the company's statement of financial position, then bondholders may view it positively, leading to increased bond prices. However, if the open offer is seen as a sign of financial instability, it could signal higher risk to bondholders, potentially leading to lower bond prices or credit rating downgrades.

10.5 Offers for Subscription and Offers for Sale

A company applying for a listing on a stock exchange is said to be undertaking an initial public offering (IPO). It can use one of several methods to achieve this, including:

- offer for subscription
- offer for sale, or
- placing.

10.5.1 Offer for Subscription

An offer for subscription is a method of issuing new shares in the primary market in order to raise new capital. It should be differentiated from secondary market capital raising issues, such as rights issues and open offers, which involve the sale of existing shares. In this method, the company offers the new shares directly to the public, at a price that is usually set below the market price to encourage investor participation.

To meet regulatory requirements, the company must provide the following information:

- A detailed prospectus, known as an offer document.
- This document must contain comprehensive information about the company and its directors, and how the proceeds from the share issue will be used.
- It must be prepared by the company's directors and be reviewed by an independent sponsor, such as a solicitor or accountant.
- The sponsor must confirm that the company's working capital is adequate.
- An advertisement detailing the flotation must be placed in a national newspaper.

An IPO that uses the offer for subscription method requires the company to offer its new shares directly to the public by issuing a detailed prospectus and placing an advertisement (eg, in the national press). The company will also arrange for an issuing house to underwrite the share issue – in exchange for a commission, the underwriter will take up the remaining shares if the issue is undersubscribed.

10.5.2 Offer for Sale

Similarly to an offer for subscription, an offer for sale is another method of issuing new shares in the primary market in order to raise new capital, and it too requires the preparation of an offer document to investors.

Unlike an offer for subscription (where new shares are offered directly to the public by the company), an offer for sale involves a third party to facilitate the sale of shares to investors. This third party – an **issuing house** – then invites applications from the public at a slightly higher price than what the issuing house paid for them in order to cover its fees and generate a margin for the service provided.

An offer for sale can be made on either a fixed or a tender price basis.

Fixed Price Offer	Tender Offer
• When a fixed-price offer is made, the price is usually fixed just below that at which it is believed the issue will be fully subscribed, so as to encourage an active secondary market in the shares. • Subscribers apply for the number of shares they wish to purchase at this fixed price. • If the offer is oversubscribed (as it nearly always is, given the favourable pricing formula), then shares are allotted either by scaling down each application or by satisfying a randomly chosen proportion of the applications in full. The precise method used will be detailed in the offer document.	• Under this method, investors subscribe for the number of shares they wish to purchase and state the price per share they are prepared to pay. • Once the offer is closed, a single strike price is then determined by the issuing house to satisfy all applications tendered at or above this price. • As with a fixed-price offer, this strike price is typically set at just below that required for the entire share issue to be taken up, again to ensure an active secondary market in the shares.

Although tender offers are the more efficient way of allocating shares and maximising the proceeds from a share issue, they are also more complex to administer, so tend to be less common than fixed price offers.

10.5.3 Placing

In placing its shares, a company simply markets the issue directly to a broker, an issuing house or other financial institution, which in turn sells the shares to selected clients. Hence, this method is also known as a selective placing.

A placing is the least expensive IPO method, as the prospectus accompanying the issue is less detailed compared to the other two methods, and no underwriting or extensive advertising is necessary. For this reason, a placing is the preferred new issue route for companies looking to list on smaller or alternative markets (eg, the UK's AIM, formerly known as the Alternative Investment Market).

However, if the the company is seeking a full listing (ie, it aims to be listed on a major stock exchange under the listing rules, which typically involve stricter regulatory requirements), then the issue must still be advertised (eg, in the national press).

10.5.4 Impact of IPOs on Investors

The impact of IPO methods on shareholders and bondholders can vary.

Shareholders are primarily concerned with dilution: existing shareholders may see their ownership percentage reduced if new shares are issued. However, if the capital raised is used for growth or debt reduction, then it could boost long-term shareholder value. In the case of an offer for sale or placing, there may be no immediate dilution, but shareholders may react to market perception about the sale of shares or the selectiveness of the placing.

If the funds from the IPO are used to expand the business or invest in growth, then this could be a concern for bondholders as the increased risk from expansion might affect the company's ability to service its debt. Similarly, if the funds are used to pay down existing debt, this may signal that the company is facing financial difficulties and is unable to access other forms of capital. On the other hand, if the funds raised are used to strengthen the company's statement of financial position (eg, by paying off debt or stabilising its finances), then it could make the company less risky for bondholders, which would be a positive outcome.

10.6 Calculating the Effect of Corporate Actions

Learning Objective

4.4.2 Be able to analyse the theoretical effect on the issuer's share price of the following mandatory and optional corporate actions: bonus/scrip; consolidation; rights issues

Corporate actions are usually expressed using a securities ratio, which refers to the terms of a particular corporate action. The market convention is to quote the terms as 'X new shares for each existing Y shares'.

Example

A company announces a 3:2 bonus issue. This indicates that an investor will receive three new shares for every two shares already held: the first number indicates the number of new shares that will be received, and the second number refers to the existing holding.

For example, if an investor has a holding of 10,000 shares, they will then receive an additional 15,000 shares (ie, 10,000 x 3 / 2) to make their total holding 25,000 shares.

10.6.1 Bonus Issues

As discussed in section 10.2.1, under a bonus issue, a company issues new shares to existing shareholders in proportion to their existing shareholding. The primary aim is often to increase the share's marketability by reducing the share price.

For example, if a company's shares were trading at £16 each, it might announce a 3:5 bonus issue to reduce the price and enhance the shares' appeal. What would be the theoretical effect on the post-bonus issue share price (ie, the theoretical ex-bonus price (TEBP))?

Assume that an investor holds 1,000 shares which are valued at £16,000. Under the terms of the bonus issue, they will receive an additional 600 shares, and the theoretical effect on the share price is as follows:

Shares	No of Shares	Price	Value
Before the bonus issue	1,000	£16	£16,000
Bonus issue	600	–	–
After the bonus issue	**1,600**	**£10**	**£16,000**

The TEBP is simply calculated by dividing the value of the shares by the increased number of shares that the investor now holds (ie, £16,000 ÷ 1,600 = £10).

As no new money is raised in a bonus issue, the total value of the investor's holding remains the same. The only change is that the share price reduces, ideally making the shares more attractive to potential investors. (Note: the new share price is referred to as 'theoretical' since, in practice, investor perception and the forces of supply and demand will influence the actual price.)

10.6.2 Share Split

A company can also reduce the market price of its shares to make them more marketable, without capitalising on its reserves, by undertaking a share split. Recall from section 10.2.2 that a share split simply entails dividing each existing share into a greater number of shares, with each new share having a lower nominal value, without changing the overall nominal value of the company's share capital.

Assuming that an investor held 1,000 ordinary £1 shares, which were priced at £4 per share. The theoretical effect on its share price can be seen in the following table:

Shares	No of Shares	Price	Value
Before the split	1,000 ordinary £1 shares	£4	£4,000
After the split	4,000 ordinary 25p shares	£1	£4,000

Although the total nominal value of the shares in issue remains unchanged, the company's overall market capitalisation should increase as its shares become more marketable. Provided that other factors remain the same, the effect of a stock split on the share price should be similar to that of a bonus issue.

A company may choose a share split over a bonus issue. While the reduction in the share price from a bonus issue may have its advantages, it also carries potential drawbacks. For example, if the share price is falling, a bonus issue could cause the price to drop below its nominal value, which would prevent the company from raising finance by issuing more shares. An alternative way to reduce the share price, but avoid this risk, is to undertake a share split.

10.6.3 Consolidation

A consolidation (covered in section 10.2.3) occurs when a company reduces the number of shares in circulation by combining them, which results in each new share having a higher nominal value. This is typically done to raise the share price to a more marketable level, especially when the share price has fallen significantly (which may, in turn, impact the company's ability to raise new capital or issue new shares at a reasonable price).

Assuming an investor holds 1,000 ordinary shares with a nominal value of 50p each, and the shares are priced at £1 per share. The theoretical effect on the share price can be seen in the following table:

Shares	No of Shares	Price	Value
Before the consolidation	1,000 ordinary 50p shares	£1	£1,000
After the consolidation	500 ordinary £1 shares	£2	£1,000

From this, we can see that the consolidation has reduced the number of shares in circulation, which has effectively doubled the share price from £1 to £2. At the same time, it has maintained the total value of the investor's holding at £1,000 due to the higher nominal value per share after the consolidation.

10.6.4 Rights Issue

Rights issues (covered in section 10.3) occur when a company offers existing shareholders the opportunity to purchase additional shares at a discounted price, typically in proportion to their existing holdings, in order to raise new capital. The new shares rank *pari passu* with those already in issue; therefore, the share price will be adjusted once the shares are traded **ex-rights**, to reflect the additional capital raised and the greater number of shares in circulation.

The following example shows what takes place during a rights issue, the effect on the share price, and the options available to shareholders.

Example

ABC Holdings has one million shares in issue, currently trading at £4 each. To raise finance for expansion, the company decides to offer its existing shareholders the right to buy one new share for every five they currently hold (ie, a 1-for-5 rights issue). This means that the company will issue 200,000 new shares (ie, 1,000,000/5). The price of the new shares is set at a discount to the prevailing market price, at £3.50 per share.

The price to which the share price will fall as a result of the rights issue is called the theoretical ex-rights price (TERP). This is calculated as follows:

Shares	No of Shares	Price	Value
Before the rights	1,000,000	£4.00	£4,000,000
Rights	200,000	£3.50	£700,000
After the rights	**1,200,000**	**£3.92**	**£4,704,000**

The company initially has 1,000,000 shares which, at the current price of £4, are valued at £4 million. Under the terms of the rights issue, investors can subscribe for one new share for every five existing shares held, so the company will issue an additional 200,000 shares from which it will raise £700,000 of capital (ie, 200,000 x £3.50).

After the rights issue, the company is theoretically worth £4.7 million but it has more shares in circulation. To calculate the TERP, we need to divide the company's post-rights value by the increased number of shares in issue. The TERP will, therefore, be £3.92 (ie, £4,700,000/1,200,000), which represents the theoretical price that the shares trade at immediately after they go ex-rights. However, the actual price will be determined by market factors such as supply and demand, as well as investor sentiment towards the issue.

During the rights issue period, the rights are known as nil-paid rights; these are separately tradeable and will have some value, known as the rights premium. This premium can be calculated using the above information:

Theoretical rights premium = TERP – Subscription price

In this example, the TERP is £3.92, and each right gives a shareholder the right to subscribe for one additional share at £3.50. Therefore, the theoretical rights premium is £0.42 per right.

As discussed in section 10.3, each shareholder is given choices regarding how to proceed following a rights issue. Using this information, a shareholder with 1,000 shares in ABC Holdings can choose from the following:

- **Take up the rights in full,** by paying £3.50, and increasing their holding in ABC Holdings by 200 shares to 1,200 shares. This would cost the shareholder £700 (ie, 200 x £3.50), so they would need to ensure that they have sufficient cash to cover the purchase.
- **Sell all of the rights on to another investor** – in this case, the shareholder would receive £3.50 per right (ie, £700 in total), as this is the price at which they can purchase the new shares.
- **Sell some of the rights** – the shareholder could instead sell just part of the rights (again at £3.50 per right), and use the proceeds to take up the remainder of their entitlement.
- **Take no action and allow the rights to lapse** – if the investor chooses this option, the company's advisers will sell the rights at the best available price and pass on the proceeds (after charges) to the shareholder.

11. Market Activity

Learning Objective

2.4.1 Be able to assess characteristics of: traditional investment exchanges; alternative trading platforms; over-the-counter (OTC) trading

11.1 Investment Exchanges

The **Markets in Financial Instruments Directive (MiFID)** was implemented in November 2007 and represents a central component of the European Parliament's ambition to create a single market in financial services for the European Economic Area (EEA). Under MiFID, investment firms are required to take all reasonable steps to deliver best execution to their customers, taking into account factors including speed, cost and certainty of execution and settlement. The directive aims to promote competition between trading venues based on market transparency and a regulatory level playing field. Under MiFID, key execution venues include:

- **Regulated markets**, referring to regulated stock exchanges such as NYSE Euronext, the LSE's Main Market and the Frankfurt Stock Exchange, operated by Deutsche Börse.
- **Multilateral trading facilities (MTFs)**, **organised trading facilities (OTFs)** and **systematic internalisers (SIs)** – see section 11.2.3 of this chapter.

The regulated markets and their equity-trading systems in the selected markets are as follows:

11.1.1 UK

The **Stock Exchange Electronic Trading Service (SETS)** is the **London Stock Exchange** (LSE)'s flagship electronic order book, trading FTSE 100, FTSE 250 and the FTSE Small Cap Index constituents, as well as some other liquid securities. The exchange also operates a modified version of SETS for trading covered **warrants** and other structured products.

The LSE's Main Market is its flagship market for the listing and trading of equity, debt and other securities. **AIM** is a share trading market established principally for small companies; classified as a MTF. it is regulated by the LSE but it has less demanding listing rules.

SETSqx (Stock Exchange Electronic Trading Service – quotes and crosses) is a trading platform for less liquid securities than those traded on SETS. SETSqx combines a periodic electronic auction book with stand-alone non-electronic, quote-driven market making. Electronic orders can be named or anonymous.

Stock Exchange Automated Quotation (SEAQ) is the LSE's trading platform for the fixed-interest market and AIM securities that are not traded on either SETS or SETSqx.

11.1.2 Europe

While nearly every country in Europe (excluding the UK) has a stock exchange, only four are considered major exchanges with a market capitalisation exceeding $1 trillion: Euronext, the Frankfurt Stock Exchange (Deutsche Börse), the Swiss Stock Exchange (SIX Swiss Exchange), and Borsa Italiana.

Euronext combines markets in Amsterdam, Brussels, Dublin, Lisbon, Paris and Oslo, and was formed through a series of mergers, including with the historic Paris Börse.

Germany is the central location for business in Europe. Of its seven stock exchanges, the Frankfurt Stock Exchange is the largest. Over 90% of stock trading at all German stock exchanges is conducted through Xetra, a fully electronic, order-driven platform of Deutsche Börse. Xetra automatically matches orders, so it is useful for securities that are traded often with high liquidity, for example the DAX 40 Index of blue-chip shares.

Other major European financial centres are France, the leading stock market index of which is the CAC 40, and Italy, where Borsa Italiana, the country's primary exchange, hosts the 40 largest Italian companies.

Switzerland is another leading centre for financial services, with a centuries-old tradition of private banking for wealthy clients. It is outside the European Union (EU) and the eurozone, but participates in the European single market.

11.1.3 US

The US is home to the world's largest stock exchange by market capitalisation: the New York Stock Exchange (NYSE), which exceeded $25 trillion in July 2024[2]. While trading on many stock exchanges has transitioned to electronic platforms, the NYSE still features an iconic open outcry system on its trading floor, where brokers use hand signals and vocal bids to execute trades in real time.

Since companies in the US can only list on one domestic stock exchange, most technology companies choose to list on the **National Association of Securities Dealers Automated Quotation System (NASDAQ)**. NASDAQ is larger than the NYSE in terms of trading volume and daily turnover, and lists about 3,300 companies.

2 Capital.com, July 2024. What are the biggest stock exchanges worldwide? Retrieved from https://capital.com/markets/shares/largest-stock-exchanges (Accessed: January 2025)

11.1.4 Japan

The largest stock exchange in Japan is the Tokyo Stock Exchange (TSE), which is owned by the Japan Exchange Group. The TSE comprises three new market segments: prime (large-cap companies with excellent corporate governance and high liquidity); standard (companies with basic corporate governance standards and a standard level of market liquidity); and growth (companies with relatively high risks, so they must disclose progress at set time periods).

11.1.5 India

Of the seven stock exchanges recognised by the Securities and Exchange Board of India (SEBI), the two largest are the National Stock Exchange (NSE) and the BSE (formerly the Bombay Stock Exchange).

The NSE was established in 1992 as India's first exchange to provide a fully automated, screen-based trading system. Initially trading in equities and wholesale debt securities, it expanded its product offerings over the years; for example, it commenced trading in derivatives in 2000 and launched its SME-specific EMERGE platform (for the listing and trading of SME securities) in 2012.

The BSE is the oldest stock exchange in Asia. It has over 5,000 companies listed, making it the largest exchange in the world in terms of listed issuers.

11.1.6 China

China has three exchanges:

- **Shanghai Stock Exchange** was founded in 1990, and is China's largest exchange today. It lists two different types of stocks: A and B shares. The difference between them is the currency they are traded in: A shares are traded in the local renminbi (or yuan) currency, whereas B shares are traded in US dollars. Most of the 1,800 stocks listed on the exchange are A shares.
- **Shenzhen Stock Exchange** was established at the same time as the Shanghai Stock Exchange. It is the market for about 2,300 smaller and emerging sector companies.
- **Beijing Stock Exchange** was established in 2021. It is much smaller than the others. It is specifically designed to serve small and medium-sized enterprises (SMEs) and innovative firms that might not meet the listing requirements of the larger Shanghai and Shenzhen exchanges. Therefore, the Beijing Stock Exchange is seen as part of China's efforts to develop a more vibrant capital market and improve access to financing for smaller companies.

Additionally, the **Hong Kong Stock Exchange (HKEX)** plays a vital role in linking China to global financial markets in that it serves as a key gateway for international investors to access Chinese companies. Many large Chinese firms list on the HKEX to raise capital from global investors, often through dual listings. The Stock Connect programmes (Shanghai-Hong Kong and Shenzhen Hong-Kong) further integrate China's mainland markets with Hong Kong. Hong Kong's index, the Hang Seng, was introduced in 1969. It consists of the largest 80 of the 2,600 companies listed on the exchange, representing around 70% of the value of all stocks traded.

11.1.7 Saudi Arabia

The Middle East's largest stock exchange is the Saudi Stock Exchange, or Tadawul. Formed in 2007, the Saudi Stock Exchange is owned by the Public Investment Fund (the sovereign wealth fund of Saudi Arabia and one of the largest sovereign wealth funds in the world).

11.2 Alternative Trading Platforms

Traditionally, trading in securities centred on large national stock exchanges such as the LSE, NYSE and TSE. Since the mid-1990s, trading platforms (and the infrastructure supporting them) have evolved significantly from the more conventional systems, in response to the changing needs of the financial markets.

In 1998, the Securities and Exchange Commission (SEC) authorised the introduction of electronic communication networks (ECNs), also called 'alternative trading networks' (ATNs). These are essentially computerised trading platforms that allow trading of various financial assets away from a specific venue, such as a stock exchange. The primary motivation for this authorisation was to increase competition among trading firms by lowering transaction costs, giving clients full access to their order books, and offering order matching outside of traditional exchange hours.

In 2007, the Markets in Financial Instruments Directive (MiFID) – a piece of European legislation that has now been largely transposed into UK law following Brexit – became effective. Important features of MiFID include that it:

- aims to improve pre-trade and post-trade transparency, and
- introduced the concept of multilateral trading facilities (MTFs), organised trading facilities (OTFs) and systematic internalisers (SIs), thus making it easier for investors to trade securities away from a stock exchange.

MiFID II, which entered into force in 2018, extended the concept of trading venues to include regulated markets, MTFs, OTFs and SIs.

11.2.1 Multilateral Trading Facilities (MTFs)

An MTF is a system that brings together multiple parties (eg, retail investors or other investment firms) that are interested in buying and selling financial instruments and enables them to do so. These systems can be crossing networks, or matching engines that are operated by an investment firm or a market operator. Instruments may include shares, bonds and derivatives. This is done within the MTF operator's system.

An example of an equities-trading platform which captures the key characteristics of an MTF is Turquoise, which has been adopted by the LSE as pivotal to its new trade execution platform. Turquoise was originally created by a consortium of nine major investment banks and is a hybrid system that allows trading both on and off traditional exchanges.

Turquoise has been majority-owned by the LSE Group since 2010. Turquoise gives customers access to pan-European and US equity trading in more than 4,300 securities. Unique functionality in Turquoise's

integrated book combines visible and non-displayed orders to deliver increased likelihood of execution and price improvement.

In Europe, one of the aims of MiFID was to promote competition between traditional exchanges and other trading systems. Many still view the regulated market status as the gold standard trading venue. However, the distinction between regulated markets and MTFs is nowadays arguably rather blurred to the extent that this view ceases to make a great deal of commercial sense. Regulatory standards for MTFs and regulated markets are broadly the same in areas such as transparency and market abuse.

Banks and large institutions have backed the MTFs both through their custom and increasingly, as seen in the example of Turquoise, through involvement in actually establishing them. Many banks and large institutions see MTFs as an opportunity for forcing recognised exchanges to lower their fees. The trend toward increasing market fragmentation is unlikely to be halted unless there is a change of policy on the part of financial regulators.

11.2.2 Organised Trading Facilities (OTFs)

Many trades (eg, government and corporate bonds, derivatives, structured products and foreign exchange) take place between firms in the OTC market, also referred to as 'off-exchange'. OTC trading occurs directly between two parties, without a centralised exchange, and often involves custom agreements tailored to the specific needs of the participants. The OTC market is typically less regulated than exchange-based trading, which can result in greater flexibility but also more risks, such as counterparty risk, and less price transparency.

With the introduction of MiFID II in 2018, a new type of trading venue was introduced to bring more transparency and regulation to off-exchange trading activities: organised trading facilities (OTFs). An OTF is a multilateral system that is not a regulated market or an MTF. Within an OTF, multiple third-party buying and selling interests in bonds, structured finance products, emission allowances or derivatives can interact in a way that results in a contract. Equities are not permitted to be traded through an OTF; however, since derivatives are permitted, it will be possible to trade equity derivatives on an OTF.

Many transactions that were previously categorised as 'off-venue' came within a multilateral trading environment following the introduction of OTFs, thus increasing overall market transparency and the quality of price discovery, investor protection and liquidity.

A key difference between OTFs and MTFs is the ability and requirements of an OTF to use discretion when matching buying and selling interests, provided the use of discretion is in line with fair and orderly trading and with best execution obligations to clients. This helps to provide liquidity and price transparency in asset classes that have traditionally been less liquid and transparent. It also facilitates competition.

The rules and requirements that apply to OTFs and their transactions are generally the same as those that apply to MTFs. This is because OTFs and MTFs are similar multilateral systems that bring together third-party buying and selling interests in financial instruments that result in a contract.

11.2.3 Systematic Internalisers (SIs)

An SI is, in broad terms, a qualifying investment firm that (on an organised, frequent, systematic and substantial basis) deals on its own account by executing client orders outside a regulated market, MTF or an OTF. The firm executes orders from its clients against its own book or against orders from other clients.

For a firm to become an SI, it must trade on its own account on a 'frequent and systematic basis' when executing client orders outside a regulated market, an MTF or an OTF. The terms 'frequent' and 'systematic' will be measured by the proportion and volume of OTC trades in financial instruments carried out by the firm executing client orders on its own account.

The same legal entity cannot operate both an OTF and an SI.

11.3 High-Frequency Trading (HFT)

Learning Objective

2.4.2 Know the basic principles of algorithmic trading; volume weighted average price (VWAP); an algo wheel; transaction cost analysis

High-frequency trading (HFT) refers to the use of advanced algorithms and technology to trade financial instruments at very high speeds. Unlike traditional trading, where humans make decisions, HFT relies entirely on algorithms to place trades – these trades can occur in microseconds, which is far faster than any human trader could ever react.

By engaging in HFT, firms aim to profit by exploiting small, temporary price differences between markets. This is similar to traditional arbitrage, where a trader buys at a lower price in one market and sells at a higher price in another. HFT algorithms look for brief inefficiencies in the market to make quick profits. Another common HFT strategy is market making, where firms place both buy and sell orders to earn the difference between the buying and selling price, known as the bid-offer spread.

From this, we can see that HFT capitalises on small price discrepancies in extremely short time frames; hence, the impact of HFT on markets is a topic of ongoing debate. Some believe that HFT increases costs for investors and makes markets less stable. Another major concern is that HFT can create the illusion of liquidity – eg, HFT firms might make rapid trades in a stock without actual buying or selling pressure, potentially misleading traditional investors. Conversely, others argue that it improves pricing accuracy, reduces bid-offer spreads, and provides more liquidity, ultimately benefiting investors.

A well-known incident linked to HFT was the 'flash crash' of 6 May 2010, when the Dow Jones Industrial Average plunged by about 1,000 points (roughly 9%) in minutes and then quickly recovered. Regulators have suggested that HFT may have played a role in this event.

11.4 The Algorithmic (Algo) Wheel

The Algo Wheel refers to an automated system used by investment firms to select the best way to execute trades. It is designed to follow pre-set algorithms that make decisions about how and when to execute a trade, without requiring human intervention.

Example

An investment firm wants to buy 1 million shares of a stock. The firm could manually decide to place the order at the current market price or use different strategies depending on market conditions, which can be time consuming and subject to human judgment errors.

Instead, the firm uses an Algo Wheel to automate the process. The Algo Wheel is programmed with several trading strategies (or algorithms) that are designed to execute the trade in the best possible way based on the market environment. The Algo Wheel selects one of these strategies and decides how and when to place the order. For example:

- If the market is volatile, the Algo Wheel might select a strategy that breaks the order into smaller chunks and executes them over a longer period to avoid causing large price fluctuations.
- If the market is calm, the Algo Wheel might choose a strategy that places the order in one go to take advantage of the current price.
- If there are liquidity constraints, the Algo Wheel might choose a strategy that places the order in the dark pool (see chapter 1, section 4.1.2) to avoid pushing the price up in the open market.

The Algo Wheel continuously monitors the market and can switch between strategies in real time based on changing conditions, without any need for human intervention. This ensures that the trade is executed in the most efficient way possible, based on the predefined criteria – eg, minimising costs, improving execution speed or reducing market impact.

This Algo Wheel is particularly useful for firms that need to comply with best execution rules, such as those under MiFID II, which require them to prove that they are executing trades in the best interests of clients. This tool helps these firms to meet their obligations by ensuring that decisions are consistent and transparent.

However, there are some downsides. For example, the Algo Wheel depends entirely on technology, meaning that if there is a technical failure (eg, a lost internet connection), then the trade may not be executed and opportunities could be missed. Additionally, the system cannot respond well to unpredictable or 'irrational' market conditions that might require human judgement.

11.5 Volume Weighted Average Price (VWAP)

The volume weighted average price (VWAP) is a technical analysis tool to identify intra-day market trends. It is often used as a benchmark for the passive investor, as it shows the stock's average price weighted by the total trading volume. The VWAP is used to calculate the average price of a stock over a given time period.

Example

An investor is tracking the VWAP of a stock over a single trading day. Throughout the day, the stock trades in the following way:

Transaction number	Price per share ($)	Shares traded	Price x Shares traded ($)
1	10	1,000	10,000
2	12	1,500	18,000
3	11	2,000	22,000
4	13	500	6,500
	Sum =	**5,000**	**56,500**

VWAP = $56,500 / 5,000 = $11.30

The VWAP (ie, the average price at which this stock was traded, weighted by the volume of each transaction) was $11.30 per share over the course of the day. If the stock is currently trading above this price then it might indicate that it is overvalued relative to its average trading price; if it is below then it might be undervalued.

Therefore, the VWAP can be used to ascertain whether a stock has been traded at a comparatively good price. It can be used to cover any time period (including seconds, minutes, hours or weeks and) but it is best suited for intraday analysis. That said, there can still be a significant lag between the indicator and the price.

11.6 Transaction Cost Analysis (TCA)

Transaction cost analysis (TCA) is the framework used by institutional investors to achieve best execution. It involves measuring the costs of transactions (eg, commissions and fees), to determine whether those transactions have been arranged at favourable prices. TCA can be achieved for frequent traders using algorithms to identify more costly trading.

TCA is based on the principle that costs arise when you ask someone else to do something for you. Any market activity generates transactional costs, which represent the expenses needed to cover the transfer of the ownership of assets (eg, stock exchange fees, broker fees and commissions).

Transaction costs are often split into two parts:

- **Pre-trade analysis** involves taking known parameters of a trade, and determining an execution strategy that will minimise transaction costs for a given level of acceptable risk.
- **Post-trade analysis** ensures that the best execution has been delivered; for example, by calculating the difference between the actual trade price and the benchmark price (eg, VWAP), called 'slippage'.

Thus, TCA helps firms and investors to understand how well their decisions have been acted on and, following on from this, how they can improve their overall performance.

Notably, different trading strategies correspond to different risk/cost trade-offs. For example, FX TCA is more complex than equity TCA, as there are no transparent or complete data sets about all transaction volumes and prices traded in the FX markets.

12. Risk Factors in International Deals and Investment

Learning Objective

2.5.1 Be able to assess the risks associated with: dealing internationally; global investment

12.1 Operational Risks

Operational risk refers to the uncertainties and potential hazards that a company faces in conducting its daily business activities. It typically arises from failures or weaknesses in internal processes, people or systems, rather than from external factors such as political events, economic shifts or broader market risks (ie, systematic risk). As operational risks are unique to a particular company or industry, they are considered to be unsystematic risks.

Some of the operational risks that may affect international deals include:

- system failure (eg, stock exchange IT system failure)
- fraud
- vandalism or political unrest (resulting in offices/equipment for trading being damaged or staff being unable to work), and
- people (eg, making mistakes due to not understanding international rules).

Beyond that, other operational risks that will arise in the execution of trades and their settlement include the following:

- The need for authorisation to trade in certain markets or the establishment of legal arrangements with local **broker-dealers**.
- Legal restrictions on certain types of trades, such as short selling.
- Delays between placing of the order and its execution due to time differences. This may lead to trades taking place at significantly different prices due to market volatility.
- The need to undertake due diligence on a local custodian to hold and settle trades.
- Delays in transmitting details of executed orders due to timing differences.
- Delays in settlement instructions from asset manager to local custodians, again due to timing differences.
- Different rules and penalties for settlement delays and possibly compulsory buy-ins.
- Legal and physical arrangements for the safeguarding of assets.
- Communication, understanding and subsequent processing of any corporate actions.

Managing operational risk involves identifying and addressing vulnerabilities within a firm's workforce, systems and internal controls to prevent disruptions and financial losses.

12.2 Foreign Currency Risk

This risk arises when converting cash flows received from overseas investments, such as foreign stocks and shares, back into the investor's domestic currency.

One further dimension to consider evaluating performance relates to international investing and currency risk. Currency movements can have a significant positive or negative impact on returns, and most portfolio/fund managers will consider this factor when deciding whether to be over or underweight in a foreign market.

Example

A German investor is interested in investing overseas by purchasing Japanese stocks trading on the TSE. The investor may have a positive view of Japanese stocks, but at the same time they have to bear in mind that the currency rates will also change over the investment holding period. Thus, they have to consider the possibility of losses or gains on the stock market, together with the losses or gains on currency.

When they buy Japanese shares, they have to convert euros into yen (at a starting FX rate expressed in EUR/JPY). At the end of the investment holding period, the investor will sell their holdings in the Japanese shares and convert the yen received from this investment into euros.

The formula to calculate the domestic total return from an investment made in an asset in a foreign country is:

$$Rd = [(1 + Rf) \times (1 + Rfx)] - 1$$

where:

Rd = the holding period return (annualised) to an investor in a domestic base.
Rf = the holding period return gained on the investment made overseas.
Rfx = the holding period return gained on the currency exchange.

Example

A UK investor has £20,000 to invest. They convert this amount of domestic cash into dollars at an exchange rate of GBP/USD of 1.50 and now has $30,000 (ignoring the bid-ask spread and commissions). This is invested in 15,000 ABC Corp at $2.00 per share.

After one year, the shares rise in price to $2.50, and the investor sells the holding and receives $37,500. The dollars are converted back into GBP at a rate of USD/GBP of 1.90, receiving £19,737.

Calculating the Return in Local Currency (USD)

The holding period return in USD (ignoring dividends) is 37,500/30,000 or 25%.

Calculating the Return in Domestic Currency (GBP)

However, over the period, the currency has depreciated in value, so the return in GBP terms is 19,737/20,000 or a loss of 1.31%. The currency return was (1.50/1.90) – 1 = –0.2105 or –21.05%.

Alternatively, we can calculate the returns using the above formula if we have information about the asset return (+25%) and the foreign currency return (–21.05%):

$$\text{Rd} = (1+0{,}25)(1-0{,}2105)-1 = \text{-}0{,}013125 \text{ or } \text{-}1{,}3125\ \%$$

This example illustrates that foreign exchange risk can seriously affect the performance in local terms. This is especially true if the foreign currency weakens against the local domestic currency.

Hedging Foreign Currency Exposure

There are many benefits to investing in overseas assets, particularly overseas equities, owing to the positive diversification effects.

Currency risk can, however, either augment or detract from the return generated by the asset.

Foreign currency risk can be reduced, though not completely eliminated, by employing the following hedging instruments or strategies:

- Forward contracts.
- Back-to-back loans.
- Foreign currency options.
- Foreign currency futures.
- Currency swaps.

Exchange rate forecasting is an inexact science despite the existence of parity relationships and advances in forecasting techniques. While currency hedging should be considered when investing overseas, the result is usually imperfect (much like any other form of hedging).

Further, hedging strategies can also be costly, timeconsuming and sometimes inflexible – the extent will depend on the method adopted.

On balance, hedging is generally recommended when investing in overseas bonds, as bonds have a fixed income stream; any currency depreciation can erode that return, and hedging can be a useful strategy to mitigate that risk. In contrast, hedging is often avoided when investing in a diversified portfolio of overseas equities denominated in a variety of currencies, since equities are more volatile and their returns are more uncertain, therefore effective hedging is more difficult.

12.2.1 Credit Rating Risk

A credit rating is an assessment of the creditworthiness of an issuer (eg, a government or company) based on its ability to repay its debt. Credit rating agencies assign ratings that range from investment grade (ie, high quality and low risk) to non-investment grade (ie, low quality and high risk, also called speculative, high yield or junk). These ratings help investors to gauge the likelihood that the issuer will default on its debt obligations.

For higher-quality, lower-risk issuers, investors are generally willing to accept lower interest rates (ie, coupons) on their bonds. In contrast, a credit rating downgrade increases the cost of borrowing for issuers, as they must offer higher coupon payments to attract investors who perceive greater risk (eg, in an Irish government bond compared to a US Treasury bond).

The list below shows the kinds of factors or indicators credit-rating agencies employ to determine a country's credit rating. Each country's sovereign debt can be graded by scoring these factors and calculating an overall score.

- Debt profile (eg, debt service ratio, and absolute level of debt).
- Banking and financial stability.
- Liquidity and access to capital markets.
- GDP growth.
- Political system and stability.
- National security (external threats, internal strife, terrorism).
- Governance (regulatory regime, the rule of law, corruption, transparency).
- Export profile (growth, diversity).

Depending on the type of issuers, different criteria will also apply. For example, for governments, factors such as balance of payments/current account, fiscal policy and external debt obligations are also considered. Governments are also evaluated based on their ability to raise revenue, manage public debt and maintain a stable currency, all of which directly impact their overall ability to meet their debt obligations. For companies, the focus is often more on profitability, operational efficiency and sectoral risks.

The increasingly important derivatives markets are also becoming a major influence on how markets trade government debt.

End of Chapter Questions

Think of an answer for each question and refer to the appropriate workbook section for confirmation.

1. **What is the significance of the nominal value for a company's ordinary shares?**
   Answer reference: Section 1.1.1

2. **What does the term 'cumulative' entail when applied to the preference shares of a company?**
   Answer reference: Section 2.2.2

3. **How does an American depositary receipt (ADR) differ from a global depositary receipt (GDR)?**
   Answer reference: Section 3.1.1 and 3.1.2

4. **Who is eligible to benefit from the tax concessions associated with investments in enterprise investment scheme (EIS) shares?**
   Answer reference: Section 4.2

5. **What is a placing, and why is it the least expensive IPO method?**
   Answer reference: Section 10.5.3

6. **Explain the difference between a fixed and floating charge in relation to a corporate bond or debenture and indicate which would have priority in liquidation?**
   Answer reference: Section 6.3.4

7. **A 6% coupon bond, maturing in five years' time, is priced at £103.25. Calculate its flat yield.**
   Answer reference: Section 6.4.1

8. **What are CoCos?**
   Answer reference: Section 7.1.1

9. **Describe the three types of volatility to be considered when assessing an asset.**
   Answer reference: Section 8.4.1

10. **What choices are available to shareholders under a rights issue?**
    Answer reference: Section 10.3

Chapter Five

Collectives and Other Investments

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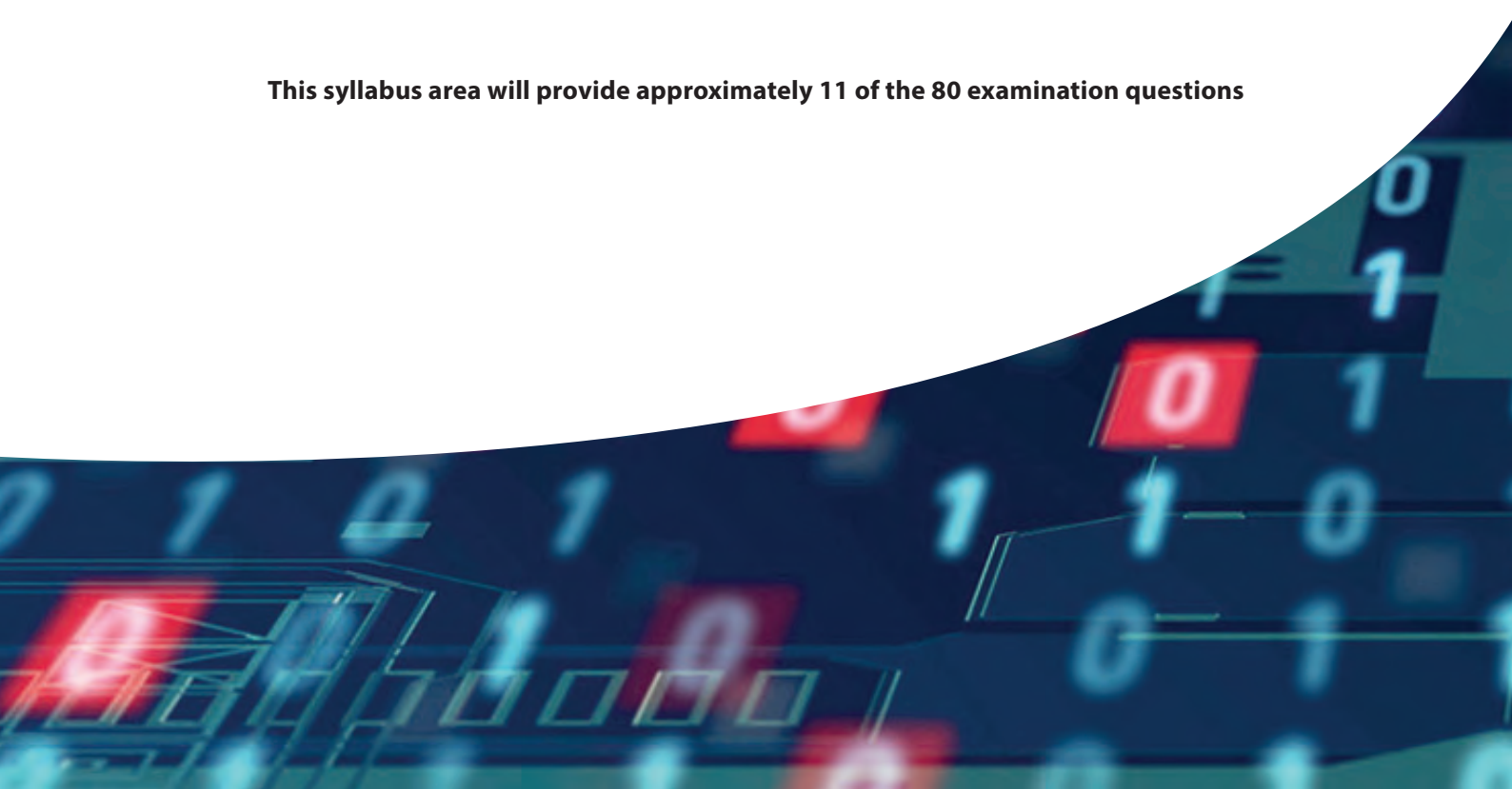
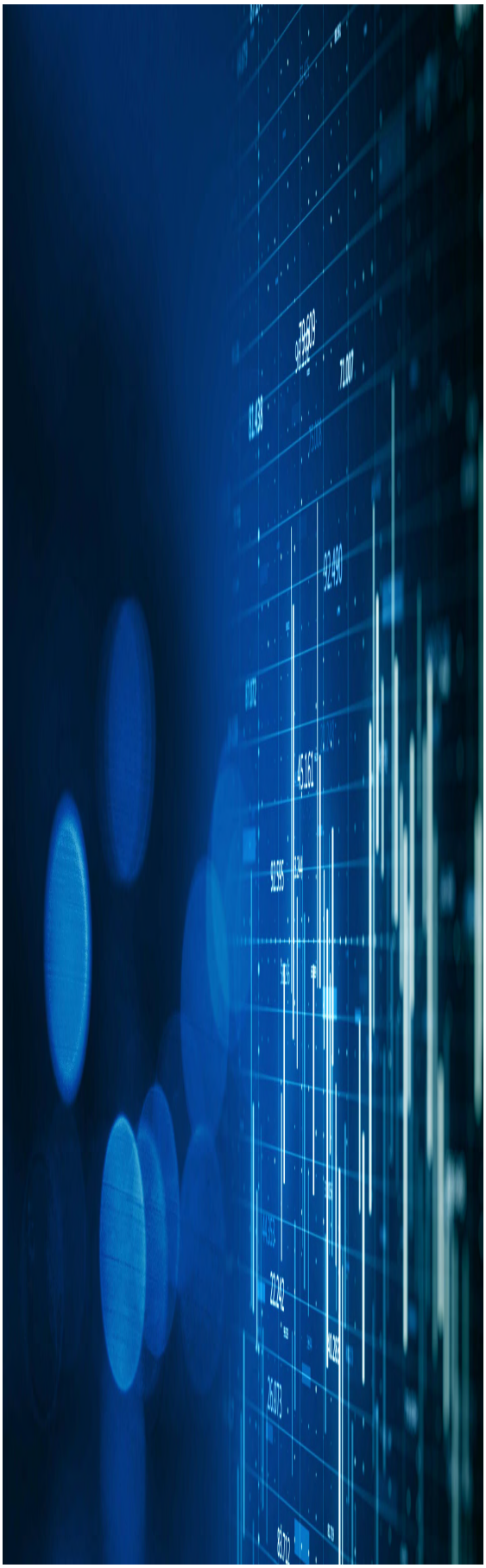
This syllabus area will provide approximately 11 of the 80 examination questions





1. Collective Investments

Learning Objective

1.2.2 Know: the purpose of a centralised investment proposition; the different types of fund structure and underlying corporate structures

5.1.2 Know why closed-ended and open-ended funds may be valued differently

5.2.1 Know the key features: accessibility; risks; tax treatment; charges; valuation and yield characteristics of the main types of exchange-traded products

Collective investment schemes (also called 'collectives', 'CISs', or 'pooled investments') are financial intermediaries that combine and pool the financial resources of many investors to create a larger diversified portfolio of assets. The term 'collective investment scheme' is internationally recognised, but CISs go by different names depending on their regulatory structure and domicile – for example, unit trusts and open-ended investment funds in the UK; Fonds Commun de Placement (FCPs) and Société d'Investissement à Capital Variable (SICAVs) in Europe; and 'mutual funds' (or 'funds' for short), in particular in the US.

A majority of CISs are open-ended. An open-ended fund is one that can create new shares or units when new investors subscribe and can cancel shares or units when investors cash in their holdings. Units/shares are sold to investors at the net asset value (NAV) per share; for example, if the underlying investments are valued at £125 million and there are 100 million shares in issue, the NAV of each share is £1.25. Open-ended funds are generally not traded on organised exchanges, but through the investment company at the quoted NAV.

Conversely, closed-ended funds do not accept any new money or redemptions while the fund is being managed; rather, they have a fixed number of shares in issue at any time. Shares are issued to the public when the fund makes its debut in an **initial**

public offering (IPO). The shares are then listed on a regulated exchange, and thereafter investors trade in these shares in the **secondary market**.

A fund mandate will typically define the following:

- The aim of the fund (eg, to generate dividend income or long-term growth).
- The type of strategy it will follow (which will tend to follow from the above).
- What regions (eg, UK, Europe, emerging markets) and sectors it will invest in.
- Maximum and minimum exposures for strategic and tactical asset allocation (eg, a fund of fund may have limits at the fund or sector level).
- What types of securities it will invest in (eg, equities, bonds, derivatives).
- Whether the fund will short sell and whether it will be hedged.
- Whether it will be geared and to what extent.
- A benchmark index that the fund aims to beat (or match, if it is a tracker fund).
- The maximum error in tracking the benchmark.

Fund mandates are set by the fund management company but publicised so that investors can choose a fund that suits their requirements.

Fund fact sheets can also provide investors with a readily available way of finding out about the investment objective, fund profile and its asset allocation, portfolio composition, portfolio turnover, fund performance and risk measures, to ensure the suitability of the fund.

Unit trusts, OEICs, ETPs and investment trusts are all retail investment funds – this means that they are CISs that are accessible to individual investors. We will now explore each of these funds in detail.

2. Open-Ended Funds

2.1 Unit Trusts

A unit trust is a professionally managed collective investment fund found in many countries including the UK, Ireland, Australia, New Zealand, South Africa, Malaysia and Singapore.

- Investors can buy units, each of which represents a specified fraction of the trust.
- The trust holds a portfolio of securities.
- The assets of the trust are held by **trustees** and are invested by managers.
- The investor incurs annual management charges and possibly also an initial charge.

Authorised Unit Trusts (AUTs)

In order to be marketed to the public, a unit trust must be authorised by the relevant regulator in the jurisdiction where it is being marketed. An authorised unit trust (AUT) must be constituted by a trust deed made between the manager and the trustee.

The basic principle of AUTs is that there is a single type of undivided unit, although this is modified where there are both income units (paying a distribution to unitholders) and accumulation units (rolling up income into the capital value of the units). The way in which income and accumulation units are

taxed will depend on the asset composition of the AUT: if more than 60% of the assets in the AUT are invested in fixed-income securities, then distributions will be made as interest income; otherwise, they will be made in the form of dividends.

Being authorised directly impacts the taxation of the fund. AUTs benefit from a more favourable tax treatment, in that they are exempt from paying tax on income and capital gains, so the fund's returns can be passed onto unitholders without being taxed at the fund level. Note that unitholders are liable for tax on the income they receive and any gains when they dispose of their units.

If the fund manager of an EU-authorised AUT wishes to market it in other EU member states, they may apply for certification under the **Undertakings for Collective Investment in Transferable Securities (UCITS) Directive**.

AUTs and OEICs (which are covered in section 2.2) are authorised investment funds (AIFs) and are collectively referred to as 'funds'.

Unauthorised Unit Trusts (UUTs)

UUTs are used for specific applications (eg, enterprise zone property holdings). As they are not subject to the same regulatory requirements as AUTs, UUTs are not marketed directly to the public.

UUTs are treated differently from AUTs for tax purposes. Generally, UUTs are subject to income tax and capital gains tax (CGT) within the fund, so the fund pays tax on income and gains before they are passed onto investors. Additionally, investors are liable for any further income tax and CGT when they dispose of their units.

A further category of UUTs is exempt unit trusts (EUTs). As their name suggests, EUTs are free of CGT on disposals within the fund (although they are still subject to income tax). Holders of EUTs are therefore strictly confined to entities that are exempt from CGT, so they are used as investments for pensions and registered charities only.

2.1.1 The Role of the Manager

Generally, the unit trust manager must also be authorised by the relevant regulator (eg, the **Financial Conduct Authority (FCA)** in the UK). The role covers:

- Marketing the unit trust.
- Managing the assets in accordance with the trust deed.
- Maintaining a record of units for inspection by the trustees.
- Supplying other information relating to the investments under the unit trust as requested.
- Informing the regulator of any breaches of regulations.

2.1.2 Buying and Selling Units

Units in unit trusts can be purchased in several ways, for example over the phone or internet. These methods will generally require payment with the order, or some form of guarantee of payment. A contract note will be produced and sent to the investor as evidence of the purchase.

Investors can sell their units through the same source they purchased or contact the fund managers directly, for example, by telephone.

2.1.3 Unit Trust Pricing

Unit trusts are valued daily at a specific time, called the valuation point, based on the net asset value (NAV). The NAV of a collective investment scheme is calculated by reference to the total value of the fund's portfolio (its assets) less its accrued liabilities (money owed to lending banks, fees owed to investment managers and service providers and other liabilities).

- The portfolio's assets are generally valued by objective criteria established at the outset of the fund.
- If assets are traded on a securities exchange or cleared through a clearing firm, the most common method of valuation is to use the market value of the assets in the portfolio (using, for example, the closing bid price or last traded price).
- The value of OTC derivatives may be provided by the counterparty to the derivative, which may be trading similar derivatives with other parties.
- If there is no objective method of calculating the value of an asset, the fund manager's own valuation methods, subject to a fund's directors or trustees, are usually used.

Example

A unit trust's underlying investments are valued at £125 million, and there are 100 million shares in issue. Thus, the NAV of each share is £1.25.

The last issue raised in the valuation techniques is very relevant to the quality of the assets under management. Some unit trusts – and funds in general – have made investments in assets for which there may be illiquid markets, (eg, complex asset-backed securities), which not only hinders the mark-to-market valuation methodology but can also prove to be a major problem if the fund has to liquidate holdings following client redemptions in adverse market conditions. It is certainly not fair to conclude that assets not traded in liquid markets suffer from inferior quality. However, the percentage of such assets should be relatively small in a fund where the shareholders or participants can exit the fund at short notice.

(This is less of a problem for some hedge funds which have 'gating' provisions which allow the fund manager to suspend redemptions in adverse market conditions – hedge funds are covered in section 6.1 of this chapter.)

The open-ended nature of unit trusts means that they cannot trade at a discount to their NAV.

Offer and Bid Prices

Most unit trusts use dual pricing, where separate buying (offer) and selling (bid) prices are quoted, typically with a 2–3% spread. However, these spreads can widen during times of heightened market risk or increased market volatility and may also be larger for funds holding fewer liquid assets.

- In a rising market, it is likely that investors demand for units will be high. In these circumstances, fund managers can move the spread to the top of the range. This means that the offer price paid by buyers will be at the highest level allowed by the relevant regulator's rules, so they are paying more per unit. However, it also increases the price at which sellers can sell (although they will receive a price lower than the offer price). This is known as being on an offer basis.
- In a falling market, it is likely that investors demand for units will be low, and they will primarily be selling. In these circumstances, managers can move the spread to the bottom of the range. This means that the offer price being paid by buyers will be the lowest level allowed. At the same time, it reduces the price for sellers (who will receive a lower price than the bid price). This is known as being on a bid basis.

In contrast, some fund managers use single pricing, where there is the same price quoted for buying and selling units, with any charges being separately disclosed.

There is no definitive advantage to single or dual pricing. However, dual pricing can provide a mechanism whereby the costs of creating and cancelling units are borne by the buyer or seller respectively that causes the cost. In contrast, for single-priced funds, the cost is borne by the fund itself, in turn affecting all investors in the fund. This is known as dilution.

Historic Pricing and Forward Pricing

Unit trust prices can be set on a historic or forward pricing basis:

- **Historic pricing** – the price that the investor pays is based on the previous valuation point. All units purchased up to the valuation point on the following day will use the same, previous price. The manager creates units units based on the expected number of sales up to the next valuation point; if sales exceed expected levels, the manager must either move to forward pricing or risk loss of money for the fund, if there is an unfavourable price movement.
- **Forward pricing** – the price that the investor pays is determined at the next valuation point. All units purchased up to the next valuation point will use this price. The manager must create units at the valuation point sufficient to cover all transactions from the last valuation point.

Each system has merits:

- With historic pricing, the investor knows the price they will pay for units, but the value of the underlying securities may not be reflected in the price paid. This benefits investors if prices have moved up, but not if they have moved down.
- Investors find future pricing confusing, as it is not possible to determine in advance the price they will pay, but the price will be more reflective of the underlying value of the securities.

In the UK, the FCA requires that for managers using the historic pricing basis, they move to a forward pricing basis if they believe that the value of the fund has changed by 2% or more since the last valuation, and if the investor requests forward pricing.

2.1.4 Charges

Generally speaking, the charges on a unit trust can be taken in four ways, as summarised in the following table (note that not all of these fees will be charged by all unit trusts):

Fund Charges	
Initial charges	An initial charge (also known as an upfront sales charge of front-end load) is applied at the time of investment, and is added to the buying price incurred by the investor. The range of initial charges varies widely from fund to fund; and may depend on whether the investor deals directly with a fund, or through a fund supermarket or platform. Initial charges tend to be higher on actively managed funds (as these funds tend to have higher operational costs), while lower initial charges are typically levied on passively managed funds. Some managers may offer discounted initial charges for direct sales including those made online. In recent years, an increasing number of fund managers have abolished their initial charges as part of their efforts to become more cost competitive, particularly against passively managed funds.
Annual management charge (AMC)	An AMC is made periodically, is generally levied at a rate of 0.5–1.5% of the underlying fund. Like the initial charge, the AMC will typically be lower for trusts that are cheaper to run, such as index trackers, and higher for more labour-intensive actively managed funds.
Performance charges	Performance fees may be applied on certain funds over and above the annual fee, based on the fund's growth or outperformance relative to a standard. Usually, these fees are only payable on net new highs (ie, the manager will not be rewarded for simply regaining lost ground if the fund's value has fallen), called the 'high-water mark'.
Exit fees	An exit charge (also called a back-end load) may apply when the investor sells units, particularly if the manager charges low or zero initial charges. These charges typically only apply when the investor sells within a set period of time (eg, the first three or five years). If exit charges apply, then they tend to be made on a sliding scale, with higher charges for those investors exiting earlier than those exiting later. The sliding scale reflects the manager's ability to recover costs through AMCs if units are held for longer.

The fund's ongoing charges figure (OCF) and total expense ratio (TER) provide investors with a clear view of the costs associated with owning a fund. Both figures include the AMC and any other ongoing variable costs, expressed as a percentage of the fund's assets. The key difference between the two is that the OCF excludes performance charges, while the TER includes them. (Note that neither the OCF nor the TER include one-time charges, such as initial charges and exit fees, which are disclosed separately.) Hence, the OCF and TER offer a simplified way for investors to understand the total cost of investing in a fund.

Charges vary from fund to fund. Whatever charges are made must be explicitly detailed in the trust deed and documentation. The documents should provide details of both the current charges and the extent to which the manager can change them.

In the UK, the Retail Distribution Review (RDR) came into force with the aim of enhancing consumer confidence and trust in the retail financial services market, particularly by improving fee and commission transparency. This led to compressed fee margins being compressed across the industry, with some fund managers innovating lower-cost products.

Further, in 2018, the Markets in Financial Instruments Directive (MiFID) II and the Packaged Retail Investment and Insurance Products (PRIIPs) regulation came into force. Both MiFID and PRIIPs are pieces of EU legislation that have been transposed into UK law, so they continue to apply in a UK context post-Brexit. Both MiFID II and PRIIPs require the disclosure of all costs and charges involved in investing in products such as funds, in order to make the cost of investing in those products completely transparent and comparable. While MiFID II applies to MiFID firms (ie, financial services businesses undertaking MiFID business anywhere in the EEA), PRIIPs applies to funds and products that are marketed to EEA-resident retail investors. See section 2.7 for more information on PRIIPs.

In 2024, the Consumer Duty further strengthened these principles by requiring firms to deliver good outcomes for consumers, including ensuring fair value, transparency, and products that meet customer needs. This regulatory shift continues to drive competitive pricing and innovation in cost-effective solutions across the market.

2.2 Open-Ended Investment Companies (OEICs)

Open-ended investment companies (OEICs, pronounced 'oiks') – also known as investment companies with variable capital (ICVCs) – are a type of open-ended collective investment. The terms 'OEIC' and 'ICVC' are used interchangeably, with different investment managers favouring one over the other. Another variation of the name is *société d'investissement à capital variable* (SICAV), which translates into English as 'investment company with variable capital' (ICVC).

OEICs and authorised unit trusts (AUTs) are authorised investment funds (AIFs), and are collectively referred to as 'funds'.

An OEIC may take the form of an umbrella fund, consisting of several separately priced sub-funds. These sub-funds may adopt different investment strategies or denominated in different currencies. Each sub-fund will have a separate client register and asset pool.

Within an OEIC, there may be different classes of shares, including:

- income shares, which pay a dividend, and
- accumulation shares, in which income is not paid out, and all income received is instead added to net assets. Dividends paid on accumulation shares are still taxable at the investors' marginal income tax rate if the shares are not held within a tax wrapper (eg, a pension).

Similarly to unit trusts, the way in which income and accumulation shares are taxed will depend on the asset composition of the OEIC: if more than 60% of the assets in the OEIC are invested in fixed-income securities, then distributions will be made as interest income; otherwise, they will be made in the form of dividends.

Since 1997, regulations have allowed OEICs to be incorporated within the scope of the UCITS Directive, meaning that they can invest only in transferable securities (eg, listed securities, other CISs and certificates of deposit). OEICs can be set up as UCITS retail schemes, non-UCITS retail schemes (NURS) or as schemes for qualified investors (QIs).

In the UK, OEICs are formed as a corporation under the Open-Ended Investment Companies Regulations and governed by the FCA's Collective Investment Schemes Sourcebook (COLL) rules, which also apply to AUTs (see section 2.1). Further, following the implementation of the Financial Services and Markets Act (FSMA) 2000, the range of UK-authorised OEICs was extended to align with the types of unit trusts, including money market funds and property funds.

2.2.1 The Structure of OEICs

OEICs are different from unit trusts in that OEICs have a corporate structure. The company's objective in each case is to make a profit for shareholders by investing in the shares of other companies. They differ also from closed-ended funds, and these differences are explored in more detail in section 2.8.1

An OEIC must have:

- An authorised corporate director (ACD), who may be the only director; the responsibilities of the ACD include the day-to-day management of the fund.
- This is usually a firm (usually a bank) authorised by the FCA, independent of the OEIC, its directors and the ACD.
- The depositary holds legal title to the OEIC investments and is responsible for their safe custody.
- The depositary can appoint sub-custodians to take custody of the assets, but will remain ultimately responsible for their safety.
- The depositary is also responsible for ensuring compliance with key regulatory requirements.

The ACD and the depositary must be regulated by the regulator and approved as authorised persons.

In the UK, OEICs are incorporated under the Open-Ended Investment Companies Regulations. The FCA has specific rules that govern the sale and marketing of OEICs to ensure that they are promoted and distributed in a manner that is transparent, fair and in the best interests of investors. In 1997, new regulations allowed for the incorporation of OEICs within the scope of the UCITS Directive, meaning that they can invest only in transferable securities (eg, listed securities, other CISs and certificates of deposit).

2.2.2 Pricing, Buying and Selling

OEICs and unit trusts are similar in that they are both types of open-ended collective investments. However, with a unit trust, the units held provide beneficial ownership of the underlying trust assets. In contrast, the shares in an OEIC express the entitlement of the shareholders to a share in the profits of the underlying fund.

Like unit trusts, but unlike most companies:

- The value of shares in an OEIC is determined by the NAV of the underlying investments.
- OEICs cannot trade at a discount to the NAV, due to their open-ended nature.
- The number of shares in issue can be increased or reduced to meet investor demands.

OEICs are single-priced instruments, meaning there is no bid/offer spread. The buying price reflects the value of the underlying shares, with any initial charge reflecting dealing costs and management expenses being disclosed separately. The fund may meet costs of establishing the fund. OEICs are typically priced on a historic basis, with forward pricing being uncommon.

When investors wish to sell OEIC shares, the ACD will buy them. The money value on sale will be based on the single price less a deduction for the dealing charges. The ACD may choose to 'run a box' – ie, a pool of shares that can then be reissued to other investors who wish to buy. This reduces the need to create new shares or cancel existing ones; this practice helps to manage the fund's liquidity and minimise transaction costs associated with creating and cancelling shares.

2.2.3 OEIC Charges

As with unit trusts, OEICs have a range of charges that investors should be aware of. These charges can include initial charges, AMCs, performance charges and exit fees, although the specifics may vary depending on the fund. The OCF and TER of an OEIC provide investors with an overview of the costs involved in ownership. For more details, see section 2.1.4.

2.2.4 Advantages and Disadvantages of OEICs for Investors

Advantages	Disadvantages
• As for unit trusts, the general advantages of CISs apply to OEICs (eg, diversification and professional management). • Like unit trusts, there is a wide range of funds available. • The introduction of OEICs has led to lower costs for investors and greater transparency of charges, without compromising investor protection. • OEIC charges may be lower than those for unit trusts, particularly in terms encashment fees, due to single pricing. • Annual management costs are not disclosed as a separate charge, unlike as with unit trusts, which can make it easier for investors to clearly see the breakdown of fees.	Like unit trusts, OEICs are not allowed to borrow, which can limit potential returns. Investors' capital is still at risk, and the value of their shares can fluctuate or fall. Their investment may be subject to taxes, depending on the investor's personal circumstances. Investors must pay fees and other charges to invest, which can be high.

2.2.5 Money Market Funds and Manager of Managers Funds

Two examples of open-ended fund structures are money market funds (MMFs) and manager of managers (MoM) funds. MMFs are particularly important because they provide low-risk, liquid investment options that allow investors to safely park short-term capital, while earning higher returns than traditional savings accounts. Further, MoM funds offer a unique approach to diversification by employing multiple managers, each responsible for specific asset classes or strategies, which helps to mitigate risk and enhance the potential for consistent performance. Hence, MMFs and MoMs offer investors the opportunity to achieve greater diversification, reduce risk concentration and access a broader range of strategies or low-risk assets, all while benefitting from the liquidity and regulatory protections typical of open-ended structures.

Money Market Funds (MMFs)

Money market instruments are primarily used by the Treasury operations of central banks, international banks and multinational companies and are traded in a highly sophisticated market.

That does not mean, however, that they have no role to play in the investment management of a client's portfolio. Indeed, they can play a very useful and significant role, but they need to be accessed through specialist investment funds. Private investors can utilise money market accounts offered by banks or money market funds.

Money market deposits can be used as a temporary home for idle cash balances, rather than using a standard retail bank account. For a retail investor, these accounts can offer higher returns than

can be achieved on standard deposits. Money market accounts are offered by most retail banks. The disadvantage is that the higher returns can usually only be achieved with relatively large investments.

There is a range of money market funds available, and they can offer some advantages over pure money market accounts. The obvious advantage is that the pooling of funds with other investors gives the investor access to assets they would not otherwise be able to invest in. The returns on money market funds should also be greater than a simple money market account offered by a bank.

Placing funds in a money market account exposes the investors to the risks of that specific bank. In contrast, a money market fund invests in a range of instruments from many providers, and as long as these instruments are highly rated, they can offer high security levels. However, money market funds are still exposed to risk, as their values can fluctuate. Investors typically view them as a variation on cash deposits, with an expectation that the value will not fall; however, in some cases, money market funds may face liquidity issues or require support from their parent institutions.

The European Fund and Asset Management Association (EFAMA) classifies money market funds into different types to reflect different investment strategies. In addition, money market funds can be differentiated by the currency of issue of their assets. The Investment Association (IA) – which classifies investment funds, and is based in the UK – also has two money market sectors:

- **Short-term money market funds** – which must maintain a constant NAV, which means that the NAV should remain unchanged if income in the fund is accrued daily; and either paid out to the unitholder or reinvested in more units in the scheme.
- **Standard money market funds** – which should have a fluctuating NAV. It should be noted that money market funds may invest in instruments where the capital is at risk, which may make them unsuitable for some investors.

These sectors align with the European definitions of money market funds, which the UK's FCA has adopted as short-term and standard money market funds.

Under COLL rules, money market funds may only invest in approved money market instruments and deposits with credit institutions, and must meet other conditions on the structure of the underlying portfolio.

Diversifying risk across different funds with different managers reduces the risk of a manager performing poorly. This is one of the attractions of manager of manager and fund of fund structures.

Manager of Managers (MoM) Funds

A **manager of managers (MoM)** fund is a type of investment fund where the strategy used is to select several different investment managers who have the discretion to manage their own investments and make all of their own investment choices. MoM provides diversification and balance, which is better achieved by having a team of specialists instead of a single individual.

The fund is underpinned by a group of investment experts, whose performance will be closely monitored against benchmarks. The team adapt and evolve to market conditions and current performance.

Each manager has the responsibility for the investment fund they are assigned to, and the manager of managers is responsible for ensuring that the managers are employed as effectively as possible, taking into account that no single manager is an expert in all asset classes. MoMs may be used to manage assets for various purposes (eg, pension funds).

However, MoM funds can be more expensive than conventional funds due to the additional layers of management. The costs associated with selecting, overseeing and compensating multiple managers can result in higher fees compared to funds where a single manager is responsible for the entire portfolio.

2.3 Exchange-Traded Products (ETPs)

Exchange-traded products (ETPs) are open-ended investments that are listed on a stock exchange, and are traded and settled like shares. The main types are:

- exchange-traded funds (ETFs)
- exchange-traded commodities (ETCs), and
- exchange-traded notes (ETNs).

The majority of ETPs are passive investments, aiming to replicate the performance of a given market or benchmark index by investing in the constituents of that index (or a representative sample thereof). However, some ETPs are actively managed, with the fund manager making investment decisions to seek outperformance.

2.3.1 Exchange-Traded Funds (ETFs)

Exchange-traded funds (ETFs) are the most well-known type of ETP. They typically aim to track the performance of a wide variety of fixed-income and equity indices (including sector- and theme-specific indices and industry baskets), and trade very close to their NAV.

The yield characteristic of ETPs will depend on the assets they track. Some ETPs may provide income distributions from dividends, interest payments or other yield-generating activities associated with the underlying assets. These distributions can vary depending on the type of ETP, for example, a bond-based ETP may distribute interest income, while an equity-based ETP may pay out dividends.

Some distinguishing features of ETFs include:

- **Liquidity** – some ETFs are more liquid (or more easily tradeable) than others, depending the index that they are tracking.
- **Transparency** – the details of the fund's holdings are transparent, allowing their NAV to be readily calculated.
- **Real-time pricing** – they have continuous real-time pricing, thus enabling investors to trade at any time. They generally have low bid-offer spreads, depending on the market, index or sector being tracked.
- **Cost efficiency** – they have low expense ratios and no initial or exit charges are applied. Instead, the investor pays standard dealing commissions to their stockbroker.

The yield characteristic of ETPs will depend on the assets they track. Some ETPs may provide income distributions from dividends, interest payments or other yield-generating activities associated with the underlying assets. These distributions can vary depending on the type of ETP – for example, an ETP that has less than 60% of its assets invested in fixed-income securities, it may distribute income as interest income; otherwise, it will typically make distributions in the form of dividends.

ETFs do also have drawbacks:

- **Price impact** – when adjusting portfolios to reflect constituent changes, investors may buy (or sell) securities at elevated (or depressed) prices.
- **Limited research-based decisions** – buy and sell decisions are based on index constituents, not on active research.
- **No risk management strategies** – cash drag and internal costs can affect performance relative to the index ('**tracking error**').
- Investors are unlikely to employ any risk management strategies, such as short-selling or increasing the cash weighting, so they can never outperform the index they follow.
- ETFs are still exposed to market risk and will likely follow the index down in bear markets.

ETFs can be used by both retail and institutional investors for a wide range of investment strategies, including the construction of core/satellite portfolios (see chapter 1, section 2.3.1), , asset allocation and hedging.

In Europe, ETFs are usually structured as UCITS III-compliant funds. UCITS III refers to a specific version of this framework whereby funds are subject to specific rules on risk diversification, leverage and liquidity to enhance investor protection.

Replication Methods

To achieve their investment objectives, ETF providers can either use physical or synthetic replication. The risks associated with synthetic replication have been the subject of intense regulatory scrutiny by regulators around the world.

Physical replication can be achieved either through full replication or by sampling. See chapter 1, section 2.2 for more details on full replication/sampling and other passive investment strategies.

Alternative ETF Strategies

The majority of ETFs are directional, meaning that if the specific market index or benchmark that they track rises, then the ETF's share price rises as well; and if the market falls, then so does the ETF. They also typically aim to track the performance of their benchmark index as closely as possible, without attempting to magnify or reduce the returns. However, there are variations of ETFs that use different strategies, which aim to achieve different outcomes based on market movements.

Strategy	Description
Reverse ETFs	• ETFs can be constructed as reverse ETFs or inverse funds, which means that they are constructed in a manner that the ETF has either outright short positions in the underlying instruments for the sector or derivatives that provide a synthetic short position for that sector. • Accordingly, an investor who buys or takes a long position in an inverse fund is effectively short the sector or index, and will benefit from a downward movement in that particular sector or index. This feature makes it easier for investors to take a short position, rather than having to borrow stock from a brokerage.
Leveraged ETFs	• These are a specialised type of ETF that attempt to achieve returns that are more sensitive to market movements than non-leveraged ETFs, and carry higher charges as a result. • To accomplish their objectives, leveraged ETFs use a range of financial engineering techniques and investment strategies, such as equity swaps, futures contracts and other derivative instruments. They also employ frequent rebalancing to achieve the desired return. • An important characteristic of index-tracking leveraged funds is that they seek to achieve their stated objectives daily. Their performance over longer periods of time can differ significantly from the multiple (or inverse multiple) of the index performance, and this effect can be magnified in volatile markets. • Leveraged index ETFs are often marketed as bull or bear funds: • A leveraged bull ETF might attempt to achieve daily returns that are 2x or 3x more pronounced than an index such as the FTSE 100 or the S&P 500, for example. • A leveraged inverse (bear) ETF will attempt to achieve returns that are –2x or –3x the daily index return, meaning that it will gain double or triple the loss of the market.

2.3.2 Exchange-Traded Commodities (ETCs)

Exchange-traded commodities (ETCs) are investment vehicles that track the performance of an underlying commodity index, including total return indices based on a single commodity. Similar to ETFs, ETCs are traded and settled exactly like ordinary shares on their own dedicated segment of an exchange. They benefit from market maker support, which ensures guaranteed liquidity and enables investors to gain exposure to commodities on-exchange during market hours.

Most ETCs implement a futures trading strategy, which may produce different results from owning the commodity. For many commodity funds, this involves simply rolling so-called front-month futures contracts from one month to the next. While this provides exposure to the commodity, it also subjects the investor to risks that arise from the differing prices along the term structure of futures contracts – this may include additional costs, as contracts have to be rolled forward.

While the terms 'ETC' and 'commodity ETF' are used interchangeably, there are structural differences between the two. For example, while ETCs typically track a single commodity or commodity index, commodity ETFs enable investors to gain exposure to multiple commodities or baskets of commodities.

ETCs are not UCITS III-compliant but they are fully collateralised, meaning that counterparty risk is effectively hedged out.

(In addition to ETCs, there are also exchange-traded currencies (ETCs), which provide exposure to foreign exchange (FX) spot rate changes and local institutional interest rates. It is important not to confuse exchange-tradd commodities with exchange-traded currencies, as they refer to different asset classes.)

2.3.3 Exchange-Traded Notes (ETNs)

An exchange-traded note (ETN) is a senior, unsecured, unsubordinated debt security issued by an underwriting bank. Again, they are not UCITS III-compliant.

When an investor buys an ETN, the underwriting bank promises to pay the amount reflected in the index, minus fees, upon maturity. Thus, the ETN carries additional risk compared to an ETF. In the event of a downgrade in of credit ratings or if the underwriting bank goes bankrupt, the value of the ETN may be significantly eroded.

There are two types of ETNs:

- **Collateralised ETNs** – which are hedged partly or fully against counterparty risk.
- **Uncollateralised ETNs** – which on the other hand, are fully exposed to counterparty risk.

Although linked to the performance of a market benchmark, ETNs are not equities or index funds, but they some similarities with both. Like equities, they are traded on an exchange and can be shorted; and like index funds, they are linked to the return of a benchmark index. However, as debt securities, ETNs do not actually own any of the underlying assets that they track.

ETNs can be liquidated before their maturity by trading them on the exchange or by redeeming a large block of securities directly to the issuing bank. Redemptions typically occur every week, and a redemption charge may apply, subject to the procedures described in the relevant prospectus.

Since ETNs are unsecured, unsubordinated debts, they are not rated, but are backed by the credit of underwriting banks. Like other debt securities, ETNs do not have voting rights. Unlike other debt securities, ETNs do not pay interest.

2.4 Risks of ETPs

As well as understanding the different types of ETPs, it is important to be aware of the risks that arise from certain practices, such as stock lending and the use of swap counterparties.

2.4.1 Collateral and Counterparty Risk

Like traditional index funds, many ETPs engage in stock lending to generate fee income. This involves the fund lending securities to other market counterparties in exchange for fees, which can help offset the fund's operating expenses.

However, stock lending introduces the following risks:

- **Counterparty risk** – the risk that the party to whom securities have been lent fails to return the securities when required.
- **Collateral risk** – the risk that the collateral provided to secure the loaned stock is insufficient to replace the loaned securities, if necessary.

To manage these risks, ETPs that lend securities employ a number of established techniques, including:

- enforceable legal agreements
- taking collateral of greater in value than the securities lent, and
- regular mark-to-market assessments of the loaned securities so that additional collateral can be called, if required.

ETFP that engage in securities lending must provide a detailed description of the associated risks, conflicts of interest and impact on performance. They should also outline their collateral management policy, including the procedures for recalling any lend securities or terminating lending agreements at any time. Details of fees arising from securities lending and fee-sharing arrangements with lending agents should be disclosed.

2.4.2 Swap Counterparty Risk

ETPs that use swaps are also subject to counterparty risk, in the same way as for securities lending. European ETPs that are structured as UCITS funds have to meet certain concentration and diversification requirements, including that:

- a fund cannot invest more than 20% of its NAV in instruments issued by the same entity, and
- the maximum exposure to any swap counterparty is limited to 10% of the fund's NAV.

As a result, swap-based ETPs typically have multiple counterparties, and manage exposure by requiring collateral to be posted with an independent custodian. Most providers disclose the composition of the collateral taken daily on their websites.

2.4.3 Liquidity Risk

Liquidity risk refers to the potential difficulty in quickly trading a security or asset, especially when selling it to realise cash. It also refers to the ability to sell an asset (or, in the context of a fund, an underlying asset) without significantly affecting its market price.

For ETPs (as well as other types of investment fund including unit trusts and OEICs), liquidity risk generally relates to the fund's ability to fulfil redemption requests. Authorised and simpler funds generally carry less liquidity risk. Examples of highly liquid assets include large-cap equities, government bonds from stable economies, and money market instruments.

However, if an underlying asset lacks liquidity (eg, small-cap stocks, corporate bonds from lower-rated issuers, and directly held property), there is a risk that its price will move significantly when a sale is attempted.

2.5 Charges and Taxation

Many ETPs are managed by large financial intermediaries, such as Barclays and JPMorgan Chase. The fees and charges are very competitive and often considerably lower than those applied to more traditional managed funds.

Also, no stamp duty is applied to purchases of ETPs available on UK stock exchanges, as they are typically domiciled offshore.

In the UK, the tax treatment of ETPs will typically mirror that of other open-ended investment funds. However, it is important to confirm that the fund is classified as a reporting fund by HM Revenue & Customs (HMRC) to ensure this treatment applies – see section 3.12 on reporting and non-reporting funds.

2.6 Legal Structure of Open-Ended Funds

Despite the different names used, there are three basic legal structures used for CISs: corporate, trust and contractual forms.

	Legal Structure of CISs
Corporate form	In the corporate form, the CIS is established as a separate corporate entity in which the assets are owned by the investment company and the investors are the shareholders of the investment company. The investment company will have variable capital – in other words, its capital base can expand or contract in accordance with demand. For this reason, it is known as an 'investment company with variable capital' or ICVC. While the law in the US recognises other forms of CIS, the vast majority are open-ended mutual funds recognised in corporate form. A SICAV and an OEIC are also recognised in the same way.

	Legal Structure of CISs
Trust form	A trust is an Anglo-Saxon legal concept in which an identified group of assets is constituted and managed by trustees for the benefit of another party (the beneficiary). A trust is created by a legal deed between the manager of the trust and the trustee. The investor is a beneficiary of the trust and owns units of the trust. The trust form is found in the UK as a unit trust and in Singapore and New Zealand. In Canada, most CISs initially were recognised in corporate form but now most are recognised as trusts.
Contractual form	In the contractual form, a legal contract is used to create the fund by the investment management company. The investor enters into a contract with an investment management company, which agrees to purchase a portfolio of securities and manage those securities on behalf of the final investor. The investor owns a proportional share of the portfolio, and their holdings are represented by units. Denmark, Germany, Portugal, Sweden and Switzerland have the contractual form.

The laws of some countries allow for only one legal form for collective investments, while others allow for more than one. Luxembourg, which is the largest centre for funds domicile outside of the US, recognises both corporate and contractual forms – a SICAV is the corporate form and the FCP is the contractual one.

2.8 Closed-Ended Funds

2.8.1 Investment Trusts

Investment trusts are publicly listed companies that invest in financial assets or the shares of other companies (quoted or unquoted), found mostly in the UK and Japan.

Investment trusts are similar to OEICs in that they have a corporate structure; thus, investment trusts are run by a board of directors. The directors can choose to self-manage, which means they undertake the investment management themselves. Alternatively, and more commonly, they can outsource investment management and other tasks such as administration, registra-tion and accountancy.

While unit trusts, OEICs and ETFs are open-ended, investment trusts are closed-ended because they do not accept any new money or redemptions while the fund is being managed; rather they have a fixed number of shares in issue at any time. Shares are issued to the public when the fund makes its debut

in an initial public offering (IPO). The shares are then listed on a regulated exchange, and thereafter investors trade these shares in the secondary market. Some closed-ended funds may offer periodic redemptions, providing investors with a way to realise all or part of their investment; in such cases, these redemptions can provide liquidity.

Shares in investment trusts are not priced directly in relation to the fund's NAV, but in accord-ance with investor demand. NAV is calculated as an open-ended fund, but investment trusts trade at either a premium (ie, above the NAV) or a discount (ie, below the NAV) depending on the share price performance. The premium/discount is calculated as a percentage so investors can see how much the current share price is relative to its NAV per share. This is in contrast to unit trusts and OEICs (covered in sections 2.1 and 2.2 respectively of this chapter), which are priced at the NAV.

Investment trust company shares generally trade at a discount to their NAV. A number of factors contribute to the extent of the discount, and it will vary across different investment trust companies. Most importantly, the discount is a function of the market's view of the quality of the investment trust and its choice of underlying investments. A smaller discount (or even a premium) will be displayed if investment trusts are nearing their winding-up, or about to undergo some corporate activity such as a merger/takeover. The tax treatment of investment trusts is the same as for normal equities.

Another major difference between open-ended funds and investment trusts is the option for investment trust managers to borrow money freely (within set limits) to buy shares and other assets when they see good investment opportunities. This gearing (or leveraging) adds to the possibilities of greater rewards, but at greater risk.

2.9 Funds and Corporate Governance and Investor Protection

A further characteristic of the different types of funds is their arrangements for corporate governance and investor protection.

The International Organization of Securities Commissions (IOSCO), which is a global standard-setting body, outlines several corporate governance principles aimed at protecting investors. These principles should be incorporated into the regulations covering CISs. Investor protection in this context does not mean preventing investors from suffering any market loss; but rather, to ensure that investors understand the risks associated with a specific fund, and to prevent misleading, manipulative and fraudulent practices.

IOSCO Principles for CISs	
Independent review and oversight	CISs should be subject to review and oversight of their activities by an entity that is independent of the fund.
Legal and regulatory framework	The legal and regulatory framework should impose standards relating to fiduciary obligations, the operation of the fund, disclosure of relevant information, conflicts of interest and financial reporting.

IOSCO Principles for CISs	
Investor rights	Investors' fundamental rights may include, but are not limited to, operation of the fund in their best interests, access to certain information about the fund, the right to exit the fund, and, possibly, the right to vote on specific matters.
Internal controls	Appropriate internal controls should be in place to ensure the fund is operated in accordance with applicable legal requirements and for the benefit of investors.
Transparency	CISs should provide investors and markets with transparent information about their operations, including fees, expenses, investment activity and personnel. This transparency should promote market competition and help investors to understand the risks associated with their CIS investments.
Market and industry participants	Market and industry participants should develop codes of conduct, assist in the development of better regulations and standards, help to educate investors, and help to ensure that investors choose funds that are suited to their needs.

3. Factors to Consider When Selecting Collective Investments

Learning Objective

5.1.1 Know the factors to consider when selecting collective investments: due diligence; total expense ratio (TER); ongoing charges figure (OCF); turnover ratio; assessment of value report

Choosing a fund can be a daunting task for any investor with hundreds, if not thousands, of funds to select. Along with the investor's objectives, risk profile and investment time horizon, several factors can be considered to aid this process. Investors must therefore carry out thorough due diligence, to ensure that the selected funds are aligned with their investment criteria.

3.1 Investment Objectives

Certain fund objectives will be more suited to different kinds of investor profiles. They will not only include the investor's needs for income on a current basis but also will depend on their appetite for risk and their investment horizons.

- As a simple rule of thumb, for those investors who have a low propensity to liquidate their holdings in a short time frame and who do not require a steady stream of income, the focus on more adventurous asset classes (such as emerging markets and equity investments in technology funds) may offer the highest long-term prospects for capital gains.
- For an investor that is looking for current yield or income, the most appropriate kinds of collective investment vehicles are those focused on fixed-income securities and high dividend stocks such as utility companies.

3.2 Investment Mandate

The investment mandate of a collective investment vehicle, often defined in a trust deed, is a statement of its aims, the limits within which it is supposed to invest, and the investment policy it should follow.

The mandate may specify the types of assets that the fund can hold, including any restrictions on the proportion of assets allocated to particular asset classes, regions or sectors.

It is important to note that the investment mandate can sometimes be modified or updated – this will depend on the terms outlined in the trust deed or fund documents. For example, a fund may amend its mandate from focusing solely on domestic equities to include global equities, in order to meet changing investor needs, reduce risk (eg, by diversifying exposure during periods of market volatility), or to capitalise on growth opportunities in different regions.

3.3 Investment Strategy

Each fund follows a distinct investment strategy – ie, a plan for achieving its investment objectives, which can include different investment styles (eg, growth or value), asset allocations and approaches to manage risk. These strategies are designed to meet the diverse needs of investors, and can vary significantly between funds.

The investment strategy can impact the types of investments in which a fund can invest which, in turn, affects its risk/return profile. For example, a growth fund will typically invest in companies expected to grow faster than the market, while a value fund focuses on undervalued stocks – therefore, during periods of economic expansion or low interest rates, growth funds will likely outperform value funds, and vice versa. This distinction in investment focus can significantly affect the fund's performance, both in absolute and relative terms.

To assist investors in making informed decisions as to which funds may best suit their needs, various organisations – such as the Investment Association (IA) in the UK – categorise funds based on their investment strategies. The IA has developed a classification system that groups funds according to different their primary objectives:

- **Funds principally targeting capital protection** – aimed at preserving the value of the original investment.
- **Funds principally targeting income** – focused on generating a steady income, typically through dividends or interest.
- **Funds principally targeting capital growth** – designed to achieve higher returns by appreciating in value over time, often with higher risk.
- **Specialist sector** – focused on specific sectors such as technology, healthcare, renewable energy and infrastructure.

The general principle for qualification within a given sector is that the fund holds at least 80% of its assets in that sector.

Allocations within the fund (whether by asset type, geography or sector) are decided by the management team based on the overarching strategy. The manager's discretion in asset selection will depend on the flexibility provided by the fund's trust deed or mandate. Ongoing assessments of the

fund are typically carried out by the trustees (for unit trusts) or independent directors (for OEICs, among others) who – along with the regular reporting of the fund's assets to participants – ensure the fund is being managed in accordance with its stated strategy and the domain of permissible assets.

3.3.1 Active and Passive Management

Another important distinction in investment strategy is whether a fund follows an active or passive management approach. As discussed in chapter 1, section 2:

- **Active fund managers** use their expertise and research to select securities with the aim of outperforming a benchmark or market index. This strategy often involves higher fees due to the research, analysis and frequent trading required.
- **Passive fund managers** seek to replicate the performance of a specific market index, with minimal trading and lower fees. Passive funds aim to match (not beat) market performance, and are often seen as a more cost-effective strategy for investors seeking long-term growth without the need for active decision-making.

Both strategies align with different investment goals risk profiles, and investor preferences, and choosing between them ultimately depends on whether the investor values potentially higher returns (active) or lower costs and market-matching returns (passive).

3.3.2 Ethical, Responsible and Sustainable Investing

For some investors, ethical, responsible and sustainable investing is a priority, and there are funds specifically designed to align with these values. These funds aim to satisfy the criteria of investors who wish to invest in companies that they consider to be ethical, responsible and sustainable.

For example, there are some investors who do not wish to invest in tobacco companies, those with business dealings in certain foreign jurisdictions, or those with poor labour practices in developing countries. Alternatively, they may wish to invest in companies with strong environmental, social and governance (ESG) practices, or supporting businesses that prioritise sustainability.

The range of preferences is broad, and this is covered in more detail in section 5 of this chapter. The range of strategies that fund managers apply is equally diverse. It is therefore important to ensure that the fund strategy aligns with an investor's preferences.

Note that while the IA and other organisations categorise funds by their primary investment objectives, they do not necessarily separate out index-tracking funds or ethical, responsible or sustainable funds, even though they are common categories in the broader market.

3.4 Fund Size

As an actively managed fund becomes larger, its performance may suffer. The manager may have less time to conduct in-depth research and monitor each of the fund's holdings, and may move the market against the fund if they were to trade a sizeable amount of stock.

However, this will depend on the types of companies the fund invests in. For example, a larger size should have relatively little impact on a fund that focuses on the largest companies in the US (which have market capitalisations in the billions of dollars), or 'bricks and mortar' property funds (where considerable amounts of money are required to invest in the underlying assets).

Conversely, this could pose a challenge for a small- or micro-cap fund. For example, the larger the fund becomes, the greater the proportion of a company's shares that the fund may have to buy, which could potentially affect liquidity, the more companies it may have to invest in, which may mean compromising on the manager's investment philosophy with regard to quality, and/or the fund may need to move up the market capitalisation scale (eg, into large companies), which could impact on performance.

There is no 'one-size-fits-all' as to what is considered to be 'too large'.

Fund size is less of an issue for passively managed funds, however, since passive funds are designed to track the performance of an index, which typically consists of large, liquid companies. As such, the size of a passive fund does not create the same challenges as it does for active funds. Passive funds can therefore handle significant inflows of capital without disrupting the market or facing capacity constraints due to the composition of the underlying index. Further, as passive funds are generally more diversified, they are less affected by liquidity and concentrated positions.

A follow-on consideration is the size of the team supporting the manager in running the fund. As the fund expands, it typically requires a larger number of investments to maintain diversification, which increases the research and monitoring demands. The manager and their team may therefore need to conduct more in-depth analysis on a greater number of securities (particularly if the fund begins to invest in new sectors or asset classes), which often necessitates additional specialists or analysts in specific sectors, regions or investment types to ensure thorough due diligence. Otherwise, if the team does not scale appropriately with the fund's size, then the quality of research and decision-making may suffer, which could potentially impact performance.

One advantage of larger funds, though, is that they can spread their costs over a wider base. Data on fund size can be obtained from a range of Morningstar and Trustnet.

3.5 Track Record

Funds usually (but not always) choose an index to be their performance benchmark. This index should be representative of the fund's investment universe, and therefore match the region or sector in which the fund invests. For example, a technology fund might choose the MSCI World Information Technology Index, whereas an emerging markets fund may choose the MSCI Emerging Markets index.

The use of indices as benchmarks is one of the reasons why so many different indices exist: each one is designed to match the variety of investment strategies that funds may adopt. Even so, some funds and portfolios are better served using a composite of multiple indices to reflect a broader investment strategy.

A key challenge of using indices is that it can encourage active managers to track their benchmark index (and thus avoid the risk of underperforming), rather than genuinely trying to outperform it, yet still charging an active fee. These types of funds are often referred to as 'closet trackers'.

Further, indices are not perfect benchmarks for performance measurement. Limitations include:

- **The range available** – while the range of indices has grown over the years to cover more sectors, regions and investment styles, no single index may fully capture the complexity of funds with unique investment strategies. However, this limitation can be overcome by using synthetic indices specially calculated for a specific portfolio.
- **Changes in composition** – which introduce a form of survivorship bias. This is the tendency for failed companies/funds to be excluded from performance studies because they no longer exist. It often causes the results of studies to skew higher, because only companies/funds which were successful enough to survive until the end of the period are included.

When assessing a fund's track record, it is important to consider the fund's specific investment strategy. A fund with a strict mandate may underperform during periods when its investment style is out of favour – for example, a fund focused on value investing may underperform during periods when growth stocks are outperforming, as was seen in the 15-year bull market for growth stocks following the global financial crisis. Conversely, a value-focused fund will tend to outperform during periods of market correction or when growth stocks are considered to be overvalued. Therefore, assessing a fund's track record is only meaningful when its performance is viewed in the context of its investment strategy and the prevailing market conditions.

For passive funds, another key consideration when assessing track record is tracking error, which measures the degree to which a fund's returns deviate from its benchmark index. A low tracking error (broadly speaking, considered to be less than two percentage points a year) suggests that the fund is closely tracking its index, while a higher tracking error may indicate that the fund is deviating significantly from its benchmark. Ideally, passive funds should have a tracking error close to zero, as this reflects their goal of minimising deviations from the benchmark; in practice, though, a tracking error of zero is rare due to factors such as cash drag and internal costs (see chapter 1, section 2.2.4). Investors should be wary of passive funds with high tracking error, as this could signal inefficiencies in the fund's management, or that it is not truly passively managed. That said, for passive funds investing in niche or less liquid markets or asset classes, tracking error will naturally be higher due to wider bid-offer spreads, less frequent trading and the difficulty in exactly replicating the performance of those indices.

Finally, it is also important to remember that while past performance is useful for context, it is not a guarantee of future results.

While a fund manager with a strong past track record may be able to repeat that success in the future, remember that past performance is not an indicator of future returns.

3.6 Fund Rating

Investment funds are usually promoted on the basis of their past performance and level of charges. One of the most frequently asked questions in the investment world is: 'is past performance a reliable guide to future performance?'

Another way of phrasing this question is: what is the probability of this year's above-average performing fund still being an above-average performer next year?

One of the greatest myths perpetuated by many product providers is that the better a fund's past performance and the higher its level of charges, the greater its chances of outperforming the peer group in the future.

Remember that while past performance can provide context, it is not a reliable indicator going forward. Although the consistent achievement of a fund's objectives provides initial evidence of a manager's skill and investment style, as well as evidence of the risks taken to generate this performance, this must be weighed against two key factors:

- **Chance** – the possibility that good performance could result from luck, not skill.
- **Change** – even if good performance is attributable to skill, very few managers manage the same portfolio for any considerable length of time. Moreover, manager skill, especially an ability to exploit a particular investment style or rotate between styles, is rarely consistent in changing market conditions.

Several independent ratings agencies provide fund ratings with many offering this data free of charge. The majority of these ratings are based on risk-adjusted past performance, although some place considerable weight on qualitative factors, such as how a manager runs their fund. However, even the evaluation of qualitative factors only indicates how a certain manager is likely to perform under specific market conditions and when adopting a particular investment style.

A simple conclusion can be drawn: past performance should never be used as the sole basis on which to judge the suitability of a fund or, indeed, be relied upon as a guide to future performance.

While no ratings agency claims to have predictive power, they can provide a valuable tool for financial advisers to filter out those funds that consistently under perform.

3.7 Fund Manager Ratings

As well as assessing the fund itself, many advisers believe it is important to consider individual fund manager ratings. Fund managers regularly switch funds and jobs, so funds are not necessarily being run by the managers who were responsible for their past performance (whether positive or negative).

Fund manager ratings typically assess the risk-adjusted performance of fund managers over a specific time period (often three years). These ratings aim to identify managers who consistently add value by outperforming their benchmarks. A common method for evaluating managers is the use of the information ratio, which measures the manager's return relative to the volatility (or risk) of that return. An information ratio of more than 1 is regarded as unusual and impressive, as it indicates that the manager delivers more than 1% outperformance of the index for each 1% deviation from the index; a figure of 0.5 is still considered 'impressive'; while a negative figure indicates under-performance. From these assessments, rating agencies then classify managers into performance tiers, based on their relative performance.

3.8 Key Person Risk

One important risk for investors in certain high-profile funds relates to the possible loss of a key manager. They may retire, be lured away by higher compensation from a competitor, decide to start their own fund/firm, or be required to leave the firm for violation of FCA rules, for example.

Firms that rely heavily on the input of a 'star' manager can find themselves subject to large-scale redemptions if that manager leaves. This can lead to loss of capital, the possible recall of any borrowed funds and reputational damage. From a short-term perspective, the loss of a key manager may disrupt a firm.

That said, the level of disruption will depend on various factors. For example, the damage will likely to be less problematic and shorter lasting if:

- the team of professionals within the fund is more diversified, or
- the fund invests in larger companies that are well-researched (in contrast, if the fund focuses on smaller companies that require more intensive research and specialist knowledge, then the departure of a key manager could be more concerning).

Fund management companies have devoted considerable resources to reduce the impact of senior figures. Paying key managers more, insuring against executives' departure, and inventing quant systems to do away with manager decisions are just some of the tactics that have been used.

However, perhaps the biggest risk is in hiring a top manager and paying them too much, only to find out later that they fail to consistently deliver on the fund's objectives.

3.9 Fund Charges

As discussed in section 2.1.4 of this chapter, charges levied against a fund's assets are collectively known as the fund's ongoing charges figure (OCF) or total expense ratio (TER), depending on whether performance charges are included in the calculation.

Funds that impose high charges will put the investor at an immediate disadvantage and could prove to be a significant drag on subsequent fund performance. Active funds generally have higher initial charges and AMCs (and therefore OCFs/TERs) than passive funds, while open-ended funds generally have higher fees than closed-ended funds. That said, funds with higher fees, managed by skillful managers, have the potential to provide investors with a superior return after fees relative to one with lower charges. Fund charges are usually detailed in the same data sources as those that publish fund sizes, as well as on the fund fact sheet and other official documents.

In terms of trackers, those that closely tie their stock selection to the index they seek to outperform, without adjusting their charges, almost certainly guarantee underperformance against the index they seek to outperform.

Institutional investment in funds is naturally significantly larger than any retail investment. As a result, many funds have different share classes for retail and institutional investors. Institutional share classes will usually carry lower charges than a comparable retail fund, due to larger investment sizes and the resulting economies of scale. Institutional share classes are also used to restrict access to certain types

of investment strategy, to ensure that only institutional or professional investors (who meet specific qualification criteria) can invest in them.

3.10 Portfolio Turnover Ratio (PTR)

Portfolio turnover (or, simply, turnover) refers to the rate at which securities within a portfolio, directly or indirectly held, are bought and sold. Whether an investor holds those securities directly or indirectly, the frequency of purchase and sale transactions within the portfolio may impact on the eventual rate of return experienced by the investor, particularly if the level of trading is significant. This is a result of the costs discussed in section 2.1.4.

The nature of the portfolio is an important consideration when evaluating turnover. For example, in a core/satellite portfolio strategy (see chapter 1, section 2.4.1), the core holdings are typically held for the long term, and the satellite holdings are more frequently traded. As a result, a fund's turnover may seem high, but this could be due to the tactical satellite portion, rather than the core holdings.

Additionally, funds invested in less liquid assets (eg, small-cap equities and corporate bonds) typically exhibit lower portfolio turnover, as these securities are less frequently traded. In contrast, for example, short-dated bond funds often have higher turnover, as managers need to reinvest proceeds when those bonds mature, which occurs frequently.

Therefore, turnover should be assessed within the context of the overall portfolio strategy.

3.11 Administration

The back-office functions of collective investment vehicles, which include the administration and reporting to clients, are sometimes a major source of differentiation from the client's perspective. With many funds to choose from, and often very little in terms of performance differentiation, funds that excel in client communication and adhere to best procedures in terms of administration tend to have a competitive edge.

3.12 Authorised and Unauthorised Funds

As already covered earlier in this chapter, some CISs are authorised (ie, they are approved by the regulator), and such funds can be freely marketed to the general public in the jurisdiction concerned. Broadly, regulators will authorise only those schemes that are sufficiently diversified and which invest in a range of permitted assets.

Others are unauthorised or unregulated, so they cannot be marketed to the general public. These unauthorised schemes are perfectly legal, but their marketing must be carried out subject to certain rules and, in some cases, only to certain types of investors such as institutional investors.

When selecting collective investments, the regulatory status of the scheme should be considered as this can affect its risk, transparency and investor protections. Authorised funds generally offer more regulatory oversight, which can provide added confidence in their adherence to diversification and

other investment requirements. While unauthorised funds offer potentially higher returns or more flexible strategies, they may also come with greater risks due to the lack of regulatory scrutiny.

3.13 Onshore and Offshore Funds

CISs that are established and operated domestically are referred to as being onshore, while those that are established and operated in other jurisdictions are referred to as offshore funds.

Although offshore funds may be based in any overseas jurisdiction, some of the most commonly used domiciles include the Channel Islands (Jersey and Guernsey), the Isle of Man, Luxembourg, the Cayman Islands and the British Virgin Islands, among others. These jurisdictions are often chosen for their established regulatory frameworks, tax advantages, and flexibility for fund managers and investors.

Some (but not all) offshore funds are subject to less stringent regulation than their onshore equivalents, perhaps enabling them to pursue more flexible or riskier strategies. Additionally, offshore funds are likely to be subject to different tax treatment compared to onshore funds; and while some are regarded as more tax-efficient, others may not be. The specific tax benefits and regulatory requirements vary depending on the jurisdiction of the fund.

For example, in the UK, offshore funds are generally classified into two categories for tax purposes:

- Reporting funds.
- Non-reporting funds.

3.13.1 Reporting Funds

- A reporting fund does not have to distribute all of its income, but must report its income to HM Revenue & Customs (HMRC).
- The income need not be physically distributed, as the regime allows for deemed distributions or a combination of physical and deemed distributions.
- Offshore reporting funds are generally taxed in the same way as unit trusts and OEICs, and a UK investor will be taxed on their share of the fund's income, even if they do not receive an actual distribution.
- The main difference is that the investor receives the income without deduction of tax at source, because the fund that pays it is based outside the UK.
- If the underlying fund has more than 60% of its assets invested in cash deposits or fixed-interest securities, then the distribution is treated as an interest payment. If the fund is held outside of a tax-efficient wrapper (eg, a pension or an ISA) then the personal savings allowance applies; thereafter, the distribution is taxed in the same way as any other interest receipt.
- Otherwise, these distributions are treated as a dividend. If the fund is held outside of a tax-efficient wrapper then the dividend allowance applies; after that, the distribution is subject to tax as dividends.
- Any gains on encashment or disposal, above the annual CGT allowance, are subject to CGT.

3.13.2 Non-Reporting Funds

- If an offshore fund has not been certified as a reporting fund, then it is treated as a non-reporting fund.
- These funds may roll up investment income within the fund, often called 'gross roll-up funds'. Income and gains accruing to an offshore non-reporting fund can roll up within the fund free of tax.
- On disposal by a UK resident investor, all the gains are subject to income tax. As a result, capital gains and rolled up dividends and interest are subject to income tax rather than capital gains tax, so the investor cannot use their annual CGT allowance to reduce their tax liability.

In terms of selecting a CIS, it is important to understand whether the fund is onshore or off-shore; and for those that are offshore, whether it is a reporting or non-reporting fund. Onshore funds tend to offer more robust regulatory protections, which may reduce risk, but could limit investment flexibility. Offshore funds offer greater flexibility and tax efficiency, but may be subject to less stringent regulation, which can introduce higher risk. Further, as seen above, the distinction between reporting and non-reporting offshore funds determines how income and gains are taxed, which can impact the investor's overall return (particularly for investors that are subject to higher tax rates or seeking more tax-efficient investment strategies).

3.14 Assessment of Value

When selecting a fund, financial advisers and investors must assess the value that it provides ie, the balance between the fees charged and the value delivered through performance, service and cost-effectiveness.

Fund managers or fund boards should produce an annual assessment of value report, which evaluates whether the fund's charges are justified in relation to the value provided to investors. The report typically covers several key areas, including:

- **Fund performance** – how the fund has performed relative to its benchmark, taking into account both short-term and long-term results.
- **Service quality** – an assessment of the services provided to investors, including transparency, reporting and customer service.
- **Cost-effectiveness** – an evaluation of the fund's TER/OCF and other fees, considering whether these charges are justified in relation to the services and returns provided.
- **Value for money** – an analysis of whether the overall costs (including fixed and performance-based fees) deliver appropriate value to investors. This can involve comparing the fund's charges against its peers or against funds offering similar strategies.

Regulatory requirements for these reports have been introduced in various jurisdictions to improve transparency and investor protection. Their overall purpose is to help investors make more informed decisions, ensuring that they are paying fees that reflect the value they are receiving from their investment.

In the UK, under the Consumer Duty (a regulatory framework that places an obligation on financial services firms to act in the best interests of their customers), fund managers must ensure that the fees charged for their funds reflect the value provided to investors, particularly in light of the services offered and the outcomes delivered. This includes taking steps to ensure that the products and services meet

investors' needs, are transparent and offer fair value. Firms are required under the Consumer Duty to provide clear, transparent and well-justified charges that align with the value delivered to investors, thus safeguarding their interests and promoting fair treatment.

4. Structured Products

Learning Objective

5.3.1 Know the key features, accessibility, risks, valuation and yield characteristics of the main types of retail-structured products and investment notes: structure; income and capital growth; investment risk and return; counterparty risk; expenses; capital protection; tax efficiency

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'Structured products' is a generic term used to loosely cover a diverse range of savings and investment products. Their features and terms differ markedly from product to product so there is no single, uniform definition used to describe them. Some are designed for the mass retail market, while others target high-net-worth individuals, customers of private banks, or even ultra-wealthy individuals.

In general, though, all structured products share some common features, such as:

- They offer income or growth, but not both.
- They have defined returns and defined risks.
- They have returns linked to a defined external measure (eg, MSCI ACWI, gold or oil prices).
- They have a defined term – this can vary widely, depending on the specific product and its underlying features, and can range from a few months to several years.

Another feature of some structured products is a principal guarantee (known as a 'floor'), which protects the principal if the product is held to maturity. Examples include guaranteed growth bonds and capital-protected bonds, which are designed to return the original capital, even if the underlying asset underperforms. Other structured products have variable levels of protection, and are known as structured capital at risk products (SCaRPs).

Some structured products are traded on exchanges, but many are arranged privately for customers over-the-counter (OTC). OTC-structured products are bilateral contracts between two counterparties, which allows for greater customisation to meet individual needs (eg, a custom contract expiration or a specific pay-off profile). These products are considered to be highly exotic securities due to their complex structures, often involving multiple cash flow scenarios, which can make them difficult to value accurately. The type of structured product influences its price, suitability, expected returns and alignment with customer objectives. Additionally, as they are tailored to participants' specific requirements, their secondary market liquidity is relatively low.

All structured products are designed to run to maturity, at which point the issuer will aim to return the initial investment (or deposit) amount, along with any gain from the linked asset.

4.1 Main Categories of Structured Product

Structured products can be separated into two main categories:

- **Structured investments** – these are generally pre-packaged investments that are based on derivatives, a single security, a basket of securities, options, indices (including dual indices), commodities, debt issuances and/or foreign currencies, and, to a lesser extent, swaps. They are primarily innovations designed to fulfil highly customised return/risk objectives.

  'Capital at risk' varieties of investment-based structured products offer high returns if the linked index measure outperforms; however, they can result in losses at maturity if the underlying index performs poorly. The structured nature of such products also uti-lises barriers or buffers to cushion some of the losses in the event of larger-than-expected falls in the linked index measure.

- **Structured deposits** – these are cash-based products but can only be offered by banks which are able to accept deposits. The underlying asset in structured deposits is a cash deposit and the returns may be linked to the performance of another asset (eg, the MSCI ACWI) between the date when the fund is set up and its end date. Structured deposits are designed to return at least the initial amount deposited at the end of the product's life.

While deposit-based products benefit from the protection of a deposit protection scheme (eg, the FSCS in the UK) in the event of counterparty defaults, investment-based products do not. This key aspect sets them apart.

Structured products can be used as an alternative to a direct investment, as part of the asset allocation process to reduce risk exposure of a portfolio, or to ride the current market trend. The risks associated with many structured products (especially those products that present risks of loss of principal due to market movements) are similar to those risks involved with options. Structured product funds are also available in the market, thus enabling investors to access a range of strategies through one investment (rather than using separate structured products for each).

Even with a principal-protected product, the protection is provided solely by the issuer, so there is still counterparty risk attached to them – the value of this protection is only as strong as the credit quality of the issuer.

4.2 Characteristics of Structured Products

Structured products are packaged products based on derivatives which generally feature protection of capital if held to maturity, but with a degree of participation in the return from a higher performing (but riskier) underlying asset.

These products are created by combining underlying assets such as shares, bonds, indices, currencies and commodities with derivatives. This combination can create structures that have significant risk/return and cost-saving advantages compared to what might otherwise be obtainable in the market.

Benefits	Risks
• **Flexible** – can be tailored to suit a wide range of individual investment needs. • **Capital protection** – potential protection of initial capital investment. • **Tax efficiency** – tax-efficient access to fully taxable investments. • **Enhanced returns** – offers the potential for enhanced returns (capital and income) and reduced volatility. • **Risk reduction** – can reduce overall portfolio risk. • **Diversification** – high-net-worth investors (HNWIs) can use structured products as a way of achieving portfolio diversification. • Retail accessibility – structured products are also available at the mass retail level, particularly in Europe, where national post offices and even supermarkets sell investments to their customers.	• **Inflexible** – investors cannot amend the product if their market views change. • **Capped returns** – returns are limited, preventing full benefit in a bull market. • **Risk of breaching protection barriers** – markets may fall below protection levels. • **Inflation erosion** – capital may be eroded by inflation if no gain is achieved. • **Illiquidity** – structured products are generally illiquid, with potential loss in a secondary market. • **Credit risk** – as they are unsecured debt, there is a risk of a complete loss of capital. • **No deposit protection** – investors are not protected if the issuer fails or defaults. • **Complexity** – structured products are complex instruments so should only be recommended to informed or experienced investors. • **No shareholder rights** – investors have no rights (eg, dividends, voting rights) since they do not hold the shares directly. • **Expensive** – upfront costs are high, thereby affecting long-term returns. • **Lack of pricing transparency** – without standard pricing comparising products is difficult.

One of the most popular features of structured products is a 'Kick Out' (or 'autocall plan'), where the product can mature before its defined maturity date if certain pre-defined conditions are met. These conditions are defined on a product's start (ie, strike) date. Kick Out plans are mostly found in growth products, but also sometimes feature in income products. The returns to investors on maturity depend on the product's specific features, and if any capital protection is included.

Example

A structured product that is linked to the S&P 500, and that matures in five years, has a Kick Out feature that is observed each year on the anniversary of its start date.

If, on the observation date, the S&P 500 is above 100% of its starting level at the market close, then the product automatically matures and the original capital plus accumulated growth is paid back to the investor.

On the other hand, if the S&P 500 is below its starting level on the observation date, then the product continues for another year, when it is checked again, and this process continues until maturity.

However, the onus is on the adviser to carefully assess the value for money and the protection premium of a product – that is, the value/cost for of having the certainty of capital returned, at the expense of potential growth.

4.3 Types of Structured Products

Retail structured investment-based products fall into the following categories, each with its own risk/reward profile.

4.3.1 Principal-Protected Products

These products guarantee the return of the investor's principal, regardless of the performance of the underlying asset, offering varying degrees of exposure to asset growth.

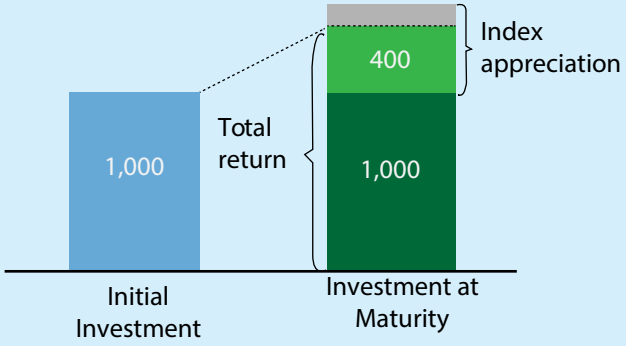
Principal-Protected Investments

A principal-protected investment may be appropriate for investors who have long-term financial obligations, but are unwilling to risk their principal. These investments generally offer a return at maturity linked to a broad-based equity index or a qualified basket of stocks, but such returns are limited or capped. In exchange for principal protection, investors may give up some or all of the potential equity appreciation or income from the underlying asset. Maturities often range from five to seven years, and investors should intend to hold the investments to maturity.

Example – Principal-Protected Investments

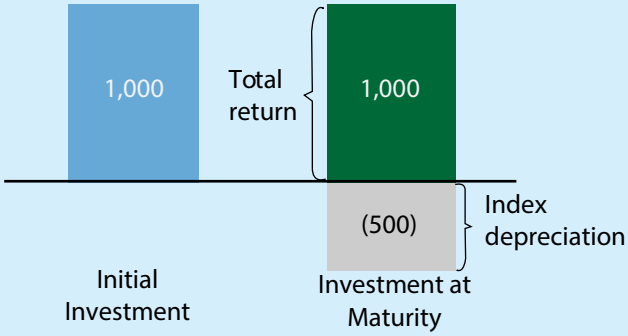
Investor A wants to preserve their principal but make money as equity markets rise. Investor A may consider the equity markets too risky for a direct investment, but is comfortable given the added protection of a principal-protected note. Investor A puts €1,000 in a seven-year principal-protected note linked to a broad-based equity index (the S&P 500) with an 80% participation in the index appreciation.

Scenario 1 – the index is up 50% at maturity:



At maturity, the investor will receive their €1,000 principal back, plus 80% of the index appreciation, equal to 40%.

Scenario 2 – the index is down 50% at maturity:



At maturity, because the index has declined, the investor will receive their €1,000 principal back.

Capital-Protected Trackers

'Capital-protected' is a broader term than 'principal-protected', as capital-protected products can include varying levels of protection or partial growth exposure, whereas principal-protected products generally do not provide participation in the asset's growth.

Like principal-protected products, therefore, capital-protected trackers provide protection for the capital invested; however, they also allow investors to gain some exposure to the growth of an underlying asset or index. The amount of participation in any growth and the protection over the capital

invested will vary from product to product, and is obtained by surrendering any right to income (eg, dividends) from the underlying asset.

Example

An instrument might be issued to track the performance of the DAX index and provide participation of 140% of any growth, but with 100% capital protection. If the DAX index is at a higher level at maturity, then the investor will receive back the initial price plus 140% of the growth over that period. If the index is lower than at the start, then the capital protection kicks in and the investor will receive back the initial price.

A capital-protected product (which is also known as a capital-protected borrowing or capital-protected loan) is generally associated with the purchase and holding of shares or other financial securities, such as single warrants. This type of product allows an investor to borrow money or obtain credit to purchase shares, which then serve as collateral for the loan. If the value of these shares or securities falls below purchase price, then the purchaser can either:

- transfer them back (via a put option), or
- surrender them to the lender to meet all outstanding obligations under the loan (via a limited recourse loan).

Therefore, the investor is guaranteed a minimum value for the purchased shares or securities. In effect, it is a loan with an embedded put option for the financed securities.

Capital-protected products generally have higher interest rates and/or additional fees than other types of product.

4.3.2 Risk-Managed Products

These products involve varying levels of protection (where investors are exposed to potential gains), but also carry some risk to their principal. They can be structured to provide greater upside potential than principal-protected products.

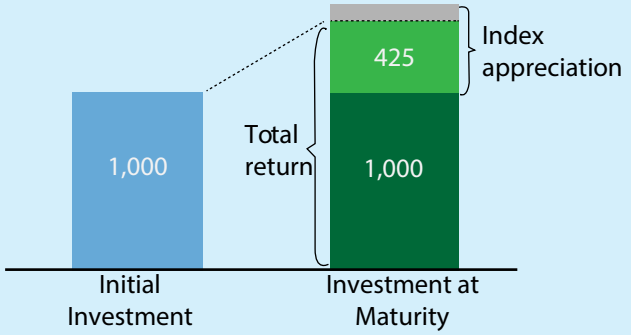
Buffer-Zone Investments

In exchange for risking their principal, investors in buffer-zone investments are offered the potential for greater upside compared with a principal-protected investment. Generally, buffer-zone investments can be structured to have a shorter maturity than a principal-protected investment (typically between two and four years).

Example – Buffer Zone Investments

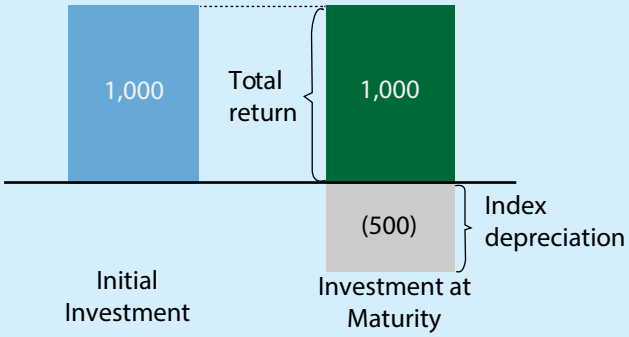
Investor B is willing to accept a 20% buffer zone, meaning they will begin to lose their principal if the index has declined more than 20% at maturity, in order to receive 85% participation in the index appreciation over three years. Investor B puts €1,000 in a three-year buffered equity note linked to a broad-based equity index with an 85% participation in the index appreciation.

Scenario 1 – the index is up 50% at maturity:



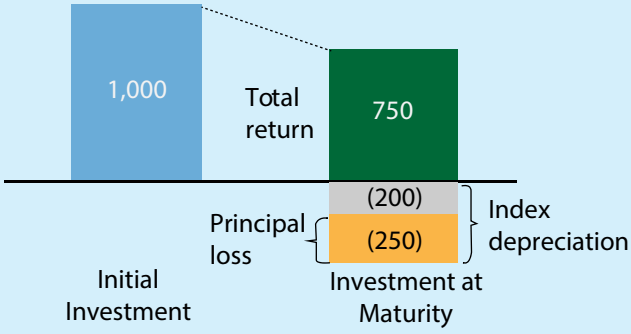
At maturity, the investor will receive their €1,000 principal back, plus 85% of the index appreciation, equal to 42.5%.

Scenario 2 – the index is 15% down at maturity:



At maturity, the investor will receive their €1,000 principal back because the index is within the buffer zone.

Scenario 3 – the index is 45% down at maturity:



At maturity, the index is 25% below the buffer zone. The investor will lose 1% of their principal for each 1% the index has declined below the buffer zone, or 25% of their initial investment.

Structured Capital at Risk Products (SCaRPs)

SCaRPs are similar to buffer-zone and principal-protected products, as described above; however, they have variable (or floating) floors instead of a fixed capital protection, so the level of protection changes based on the performance of the underlying asset. These products often pay out based on barriers, which determine the level of gain or loss. The rate of pay-out rate can vary depending on the barrier reached, with multipliers such as 1:1, 1.5:1, 2:1 and, 3:1.

Example

Investor D invests $1,000 in a SCaRP linked to a broad-based equity index. The product has specific terms that if the index falls below a certain threshold (set at a -20% decline) then the investor begins to incur losses. However, there's an important feature of the SCaRP: losses beyond the -20% threshold are amplified by a 1.5:1 multiplier – ie, for every 1% decline in the index past the -20% point, the investor loses 1.5% of their initial investment.

At maturity, the index has fallen by 25%, which breaches the -20% barrier by 5 percentage points. Given the 1.5:1 multiplier, the investor's loss is amplified by 1.5 times this drop. In this case, the investor loses 7.5% (ie, 5% x 1.5). Therefore, the total loss amounts to $75 (ie, 7.5% of $1,000); and on maturity, the investor will receive $925 (ie, $1,000 - $75).

4.3.3 Leveraged and Return-Enhanced Investments

These products are typically used by investors who are seeking higher returns in a moderately bullish market, but with the understanding that they accept full downside exposure.

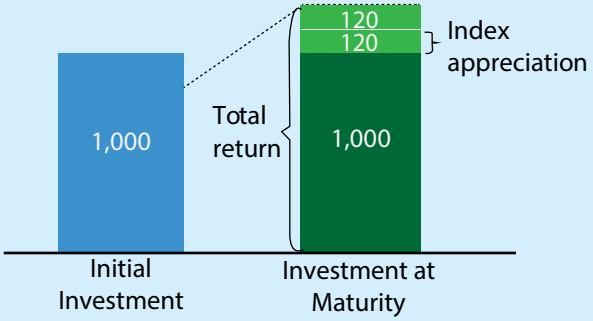
Return-Enhanced Investments

These products are ideal for investors with a float to moderately bullish outlook, as they provide leveraged upside in exchange for full downside exposure to the underlying asset. Returns are typically capped, but can be double or triple the performance of the underlying asset, subject to a pre-specified maximum. Return-enhanced investments tend to have maturities of one to three years.

Example

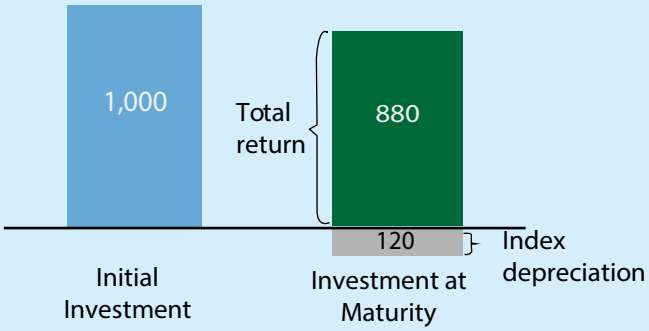
Investor C has a flat to moderately bullish market view and would like to achieve a higher return than would otherwise be possible in the current market. With a return-enhanced investment, Investor C will receive twice the appreciation in the underlying equity index as a return, subject to a maximum return or cap of 26%, at the end of two years. If the index has declined at maturity, a 1% loss in principal will occur for each 1% decline in the index. Investor C puts €1,000 in a two-year return-enhanced note linked to a broad-based equity index.

Scenario 1 – the index is up 12% at maturity:



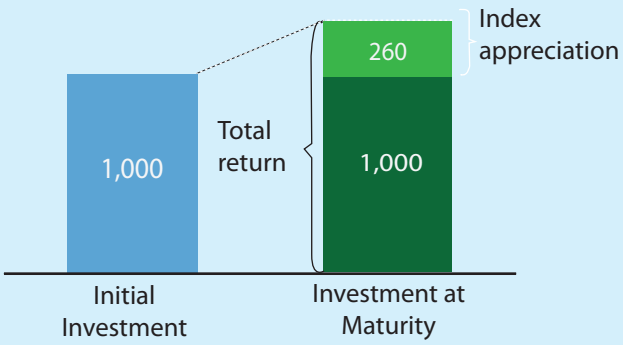
At maturity, the investor will receive their €1,000 principal back, plus double the 12% index return, equal to 24%.

Scenario 2 – the index is down 12% at maturity:



At maturity, the investor will lose 1% of their investment for each 1% decline in the index.

Scenario 3 – the index is up 30% at maturity:



At maturity, because the index is above the 13% upside cap, the investor will receive the maximum return of 26%.

Accelerated Trackers (and Boosters)

With an accelerated tracker, the investor will participate in the growth of the underlying index or asset provided that, when it matures, its value is greater than the initial value. If the asset or index is valued at less than its initial value, then the investor will lose the same amount. If the product pays out an income, which is accelerated (often quoted as a ratio), then this is often referred to as a 'booster'.

Example

An accelerated tracker might provide for the investor to participate in 200% of the growth of an index. If an investor buys £1,000 of an instrument and the index it is based on grows by 10%, then they will receive back their initial investment of £1,000 plus 200% of the growth, which amounts to £200; that is, £100 growth x 200% = £200.

If the final value of the underlying asset is, say 10% less than the issue price, then the investor will receive back the initial price of £1,000 less the change in the underlying asset (ie, 10% or £100) which amounts to £900.

The investor will usually surrender any right to the underlying income stream from the asset in exchange for the right to participate in any performance.

4.3.4 Market Index and Asset-Tracking Products

These products are designed to replicate the performance of an underlying asset or index, with or without additional leverage or protection features.

Index-Based Product Trackers

As the name suggests, a tracker-structured product replicates the performance of an underlying asset or index. They are usually long-dated instruments or even undated, so they have an indefinite lifespan.

- An **index-linked note's** return is determined by a specific index, such as an equity index, inflation index (eg, CPI or RPI) or market index.
- An **equity-linked note (ELN)** is a debt instrument where the yield is linked to the performance of an equity product, such as a company's share price. The value of the tracker moves in proportion to the underlying asset, and income is typically embedded in the capital value (rather than paid as dividends).

Where the underlying asset is, say, an index on an overseas market some trackers incorporate features that fully hedge currency risk at all times.

Example

An accelerated tracker might provide for the investor to participate in 200% of the growth of an index. If an investor buys £1,000 of an instrument and the index it is based on grows by 10%, then they will receive back their initial investment of £1,000 plus 200% of the growth, which amounts to £200; that is, £100 growth x 200% = £200.

If the final value of the underlying asset is, say 10% less than the issue price, then the investor will receive back the initial price of £1,000 less the change in the underlying asset (ie, 10% or £100) which amounts to £900.

The investor will usually surrender any right to the underlying income stream from the asset in exchange for the right to participate in any performance.

Reverse Trackers

A reverse tracker is similar to a standard tracker, except that, if the underlying asset falls, then the value of the tracker will rise. These trackers are also referred to as 'bear certificates'.

Digitals

A digital is a structured product/note that consists of a fixed payment that is either paid out or not, depending on whether a particular event linked to the product's reference occurs. For example, if the underlying asset is above a target level (usually the initial level) at maturity, then a fixed payment is made to the investor along with the capital at maturity; otherwise, only the capital is repaid. Thus, digitals are a type of capital-protected product, but with a contingent pay-out structure.

4.4 Structured Product Funds

In response to growing demand from retail investors, some innovative managers have created funds of structured products. These funds offer a diversified way for investors to access these products. Similar to other types of CIS (as discussed earlier in this chapter), structured product funds pool investments in multiple structured products, thus allowing retail investors to benefit from their features without having to purchase them individually.

4.5 Trading and Settlement

Listed structured products are usually structured as instruments such as zero coupon bonds (ZCBs) and are initially offered in the primary market, where they are made available to investors.

In the UK, they are treated as derivatives for the purpose of FCA Conduct of Business rules. A firm distributing these products must give a two-way risk warning, in the form of a generic warrants/derivatives warning notice, and either a tailored risk warning or a copy of the listing particulars.

On any subsequent dealing in the secondary market, a contract note is issued as normal. The contract note must specify the name of the investment, the nominal amount purchased, the price at which it has been dealt and any commission charged.

One key feature of listed structured products is that they are listed, held and settled in a securities settlement system (eg, CREST). They are issued in uncertificated form, and settlement is normally T+2, which is in line with other markets.

At the end of the term, the investor will usually sell the investment on the last valuation day. If it is not traded, though, then the instrument representing the structured product will be redeemed using the settlement functionality at the central securities depository (CSD) where it is held (eg, CREST).

In contrast, OTC structured products are not traded on exchanges, so they do not benefit from established settlement systems. Further, settlement methods are typically bespoke and agreed upon between the counterparties. Their lower trading volume and absence of a secondary market make them harder to value, and they carry counterparty risk, as their value and protection depend on the financial stability of the issuer or counterparty.

4.6 Charges and Tax Treatment

The fees payable for structured products are higher than for many simpler and direct holdings of assets, reflecting the specialised packaging and structuring involved. The fee structure should be transparent and laid out clearly in the offering documentation.

Structured products are normally designed to ensure that the proceeds returned at maturity are treated as capital gains, rather than income. These products can also be held within tax-advantaged accounts (eg, self-invested pension plans (SIPP) in the UK), which provide additional shelter from current taxation. However, tax treatment is subject to change and cannot be guaranteed to remain the same throughout the term of the product.

5. Ethical, Responsible and Sustainable Investment

Learning Objective

5.4.1 Be able to assess investment characteristics associated with ethical, responsible and sustainable investment: green bonds; blue bonds; impact debt; social bonds, sustainability bonds, sustainability-linked bonds, gender bonds, carbon, valuation and screening tools specific to ESG investment

5.1 Environmental and Social Governance (ESG) Investment

As we saw in section 5.2 of chapter 1, in today's world, many individuals are concerned about the environment, business practices and ethical issues. As a result, many investors seek to align their investments with their personal values – this may involve avoiding companies they deem unsuitable

(eg, tobacco or oil shares), supporting environmentally conscious companies, or using their funds to generate social and environmental impact (potentially alongside a financial return), to name a few.

Despite the growing focus on ESG factors in investment decisions, bonds are often overlooked in the construction of ESG portfolios. While equities typically receive more attention and account for a large proportion of sustainable investing activity, bonds can play an equally important role in supporting sustainable and responsible investing. In particular, ESG bonds offer investors a unique opportunity to contribute to environmental and social outcomes while maintaining a fixed-income strategy. ESG bonds currently represent a smaller portion of overall sustainable investment compared to ESG-focused equities, but they are growing in popularity among investors.

5.1.1 ESG Bonds

The following table shows the characteristics associated with ethical, responsible and sustainable investment bonds. They have features similar to conventional bonds, although they are mandated to invest proceeds into projects with particular environmental/social benefits.

Green Bonds	Green bonds are issued by private firms and public entities to raise funds to finance projects that have a positive environmental impact, such as renewable energy and green construction of buildings. For investors, the attraction is that they allow investment that contributes to social and environmental impacts.
Blue Bonds	Blue bonds are silimar to green bonds but the funds raised are to support projects related to ocean conservation and marine projects, such as promoting biodiversity. The focus is also on wastewater treatment, prevention of water pollution and water-related climate change adaptation.
Impact Debt	Impact bonds are designed to fund prevention and early intervention. Impact debt is designed to be responsive to the needs of vulnerable groups to improve their lives.
Social Bonds	Social bonds are issued to raise funds for projects that deliver positive social outcomes. The focus is, but not limited to, affordable basic infrastructure (eg, clean drinking water, sewers, sanitation, transport), health, education and vocational training for individuals living below the poverty line, marginalised populations and vulnerable groups including those affected by natural disasters.
Sustainability Bonds	Sustainability bonds raise finance for a combination of both green and social projects.
Sustainability-Linked Bonds (SLBs)	SLBs are defined as 'any type of bond instrument for which the financial and/or structural characteristics vary depending on whether the issuer achieves predefined sustainability/ESG objectives'. Proceeds of SLBs are intended to be used for general purposes, but issuers are required to define and commit to a sustainability path over a period of years. SLBs are therefore a complementary financing instrument to green, social and sustainability bonds.

Gender Bonds	Similar to other types of sustainable bond, gender bonds channel financing into projects aimed at reducing gender inequalities and promoting women's empowerment. Examples of projects include promoting access to education and healthcare for women and girls, supporting women-led businesses, and providing job training and leadership development opportunities for women in underserved regions.

The International Capital Market Association (ICMA) has developed key guidelines to ensure transparency and integrity in the issuance of specific types of sustainable bonds – Green Bond Principles (GBP), Social Bond Principles (SBP), Sustainability Bond Guidelines (SBG) and Sustainability-Linked Bond Principles (SBLP), collectively referred to as 'the Principles'. These Principles provide a framework for issuers to allocate funds to projects with clear environmental or social benefits, require rigorous reporting, and often include third-party verification.

For investors, adherence to these Principles offers assurance that funds are used as intended and that the impact claims are credible, helping to mitigate risks such as greenwashing (ie, the practice of making misleading environmental claims to improve their reputation and increase profits), among other forms of 'washing'. By aligning with these standards, issuers demonstrate their commitment to delivering measurable outcomes, thereby fostering confidence in sustainable investment opportunities.

5.2 Carbon as an Asset Class

Carbon pricing is a policy that aims to reduce carbon emissions and, in turn, combat climate change, by requiring emitters to internalise the societal costs of emissions. There are two main carbon pricing policy instruments:

- Carbon taxes, which involves the government setting a price that emitters must pay for each ton of greenhouse gas they discharge.
- Emissions trading systems (ETSs), which are market-based instruments that incentivise emitting firms to reduce their emissions. In short, the government caps the level of emissions that emitting firms are allowed to produce (hence ETSs are also known as 'cap and trade'). For each unit of emissions allowed within this cap, the government creates permits (ie, an allowance). These permits are then either allocated for free, or firms can purchase through auction. Each year, the government reduces the cap, in order to achieve further emissions reductions.

If a firm does not have enough permits, it must cut back on its emissions. Alternatively, permits are tradeable – once firms have been allotted their allowance, and if they have overachieved on their targets, then they can sell the excess permits in the secondary market to other firms. The price of the permit is often expressed as a value per tonne of carbon dioxide equivalent (tCO2e) – eg, $50 per tCO2e. Prices are set using both spot or derivatives contracts such as futures, options and swaps.

Compliance with ETS obligations is mandatory for eligible entities, and any firm in violation is subject to a penalty, which is decided by the government in question. Thus, ETSs are an effective way of encouraging firms to reduce their carbon emissions (and, in turn, mitigate climate change) on a large scale.

Carbon taxes and ETSs are the two most common mechanisms for carbon pricing, mainly due to their flexibility and efficiency. They offer clear, predictable signals for businesses and industries to reduce carbon emissions, while also generating revenue that can be reinvested into climate change mitigation and adaptation initiatives. The key difference between them is that carbon taxes charge companies according to the amount of carbon they emit, but it does not limit that amount, while ETSs set a cap on total emissions.

The EU ETS was adopted by the European Parliament and European Council in 2003, and came into force in 2005. Today, it remains the largest and most established carbon pricing mechanism in the world, covering about 45% of the EU's greenhouse gas (GHG) emissions[1]. Operating in all EU countries as well as Iceland, Liechtenstein and Norway, the EU ETS limits GHG emissions from over 11,000 installations including power stations, industrial plants and airlines.

The UK Emissions Trading Scheme (UK ETS) launched in 2021, replacing the UK's participation in the EU ETS after Brexit. The UK ETS follows a cap-and-trade model, and companies must purchase allowances to cover their emissions. Under the Ireland/Northern Ireland Protocol (an agreement under Brexit designed to avoid a hard border on the island of Ireland by keeping Northern Ireland aligned with certain EU rules), electricity generators in Northern Ireland remain within the EU ETS, which creates a distinction between the UK and Northern Ireland in terms of carbon pricing.

Elsewhere, in the US, the Regional Greenhouse Gas Initiative (RGGI) is a subnational carbon market operating in 11 eastern states, and the states of California, Washington, Oregon and others form the Western Climate Initiative (WCI).

At the national and subnational levels, ETSs are operational or are under development in Switzerland, China, Japan, Canada, Australia, New Zealand, South Korea and Kazakhstan, among others. The number of ETSs around the world has grown rapidly in recent years. In total, there are currently over 30 ETSs implemented globally (with over 20 more under development or consideration), covering jurisdictions representing nearly 60% of global GDP[2].

5.3 Valuation and Screening Tools

For investors seeking a financial return from their investment, valuation ratios (such as price/earnings ratio (PER), discussed in chapter 3, section 3) can be applied to assess whether an investment is financially viable. Those investing indirectly via funds may also consider factors that apply to other collective investments, as discussed in section 3 of this chapter.

For responsible/sustainable/ethical investors, additional criteria must be applied. More specifically, they need to evaluate whether the investment strategy is aligned with their values. Additionally, they must assess whether the responsible/sustainable/ethical investment strategy applied to the fund is appropriate, in order to ensure that the fund is living up to its sustainability claims. In this context, screening tools can be used to assess the alignment of investments with these values, and verify the sustainability claims made by the fund.

1 Environmental Protection Agency, 2025. The EU Emissions Trading System. Retrieved from https://www.epa.ie/our-services/licensing/climate-change/eu-emissions-trading-system-/ (Accessed: January 2025)

2 International Carbon Action Partnership, April 2024. Emissions Trading Worldwide: 2024 ICAP Status Report. Retrieved from https://icapcarbonaction.com/en/publications/emissions-trading-worldwide-2024-icap-status-report (Accessed: January 2025)

ESG rating providers are an important reference for financial markets in terms of assessing that the underlying securities or projects are as sustainable and responsible as they claim to be. For example:

- Moody's ESG provides research and guidance to organisations and investors interested in a responsible, sustainable or ethical approach.
- MSCI ESG Ratings ranks companies worldwide (the highest being AAA and the lowest being CCC) based on the company's management of its financially relevant ESG risks and opportunities.
- Morningstar's Sustainalytics rates the sustainability of listed companies. Morningstar itself provides Sustainability Ratings on approximately 20,000 mutual funds and ETFs.

However, each ESG rating provider uses its own research methodologies to scrutinise businesses – this, along with subjective interpretation, can result in ESG ratings varying dramatically for the same product. Steps, therefore, need to be taken to improve the transparency of these methodologies.

Other tools for evaluating a company's performance towards sustainable development include:

- compliance (or lack thereof) with stewardship codes and regulations
- alignment with global or national targets on climate change mitigation and how their outcomes contribute to those targets, and
- inclusion in a responsible, sustainable or ethical index.

Additionally, a company's voting policies and track record can provide a useful insight into their environmental and social philosophy.

This is by no means an exhaustive list, but it gives an indication of the tools that are available.

5.4 Investment Performance

Generally, investors should remember that the more restrictions they place on a portfolio, the more likely they are to limit its potential for good short-term performance. This is simply because the investment universe is smaller, so there are fewer options to select from, resulting in a less-diversified portfolio.

That said, debates revolve around whether incorporating ethical, responsible and sustainable investment factors into the investment process will help or hinder overall returns. Those in favour of such approaches sometimes argue that performance from individual investments selected on these grounds tend, over the long term, to be better than that of some other companies. This is partly because they tend to have strong internal governance criteria[3], which feeds through into better overall management controls.

However, critics argue that the additional restrictions placed on a company complying with ethical, responsible and sustainable criteria can only limit its abilities to make decisions in the (financial) best interests of its shareholders, so performance must be lower. This can be demonstrated by the market rotation in late 2021/early 2022, away from growth stocks (to which ethical, responsible and sustainable portfolios are typically biased, as innovative companies are well-positioned to address some of the world's challenges) to value stocks (which includes oil and mining companies, so are likely to be avoided within such portfolios).

3 Morningstar, August 2021. Do ESG Stocks Outperform? Retrieved from https://www.morningstar.co.uk/uk/news/214249/do-esg-stocks-outperform.aspx (Accessed: January 2025)

It is important to note, though, that for many ethical/responsible/sustainable investors, financial performance is not the most important factor, but whether the portfolio is aligned with their morals and principles. This will depend on the individual investor's priorities, though – some may prioritise environmental and social outcomes over financial returns; others may seek a balance between the two, aiming for both ethical alignment and competitive performance; while others still may seek to generate a financial return, but not necessarily at any cost. All investors are different.

In terms of relative performance, a conventional fund and an ethical/responsible/sustainable fund may both be compared to the same index (eg, the FTSE All Share Index). A conventional fund has many companies to choose from that satisfy its investment objectives, whereas an ethical/responsible/sustainable fund is restricted.

As a result, some ethical/responsible/sustainable funds may underperform the benchmark against which they have been measured. This has led to the development of several ethical/responsible/sustainable indices, each with its own set of limitations and constraints. Some believe that these indices represent a more appropriate benchmark for an ethical/responsible/sustainable fund, while others believe such funds should continue to be compared with mainstream indices to dispel ideas of underperformance.

There is a range of ethical/responsible/sustainable indices that can be used to track performance. Examples include:

- **FTSE4Good** indices were launched in 2001. They have been designed to measure the performance of companies that meet globally recognised corporate responsibility standards, and to facilitate investment in those companies. The series includes four tradable and five benchmark indices, representing Global, European, US, Japan and UK markets.
- **Dow Jones Sustainability Indices (DJSI)** track the financial performance of the leading sustainability-driven companies worldwide and provide asset managers with reliable and objective benchmarks to manage sustainability portfolios.
- The **MSCI KLD 400 Social Index** is modelled on the S&P 500 Index and is screened for ESG factors. It is a widely recognised benchmark for measuring the impact of social and environmental screening on investment portfolios.
- **Dow Jones Islamic Market (DJIM) World Index** is the first index that measures the performance of a global universe of investable equities that comply with Shariah law, launched in 1999 in Bahrain. The DJIM has an independent Shariah supervisory board, which advises on the methodology for screening securities for inclusion in the index and related matters relating to Sharia compliance of the eligible components.
- **MSCI Low Carbon Index** family is part of a family of global equity indices based on the main market-cap indices. According to MSCI, the indices help identify potential risks associated with the transition to a low carbon economy while representing the performance of the broad equity market. The first benchmarks are designed to address carbon emissions and fossil fuel reserves.

Notably, the universe of companies publicly demonstrating their commitment to managing their operations in an ethical, responsible and sustainable way continues to expand, such that responsible and sustainable investment indices are broadly keeping pace with the broader market over the long term; short-term deviations are likely to occur due to the differences in their construction.

6. Alternative Investments

Learning Objective

5.5.1 Know the main investment characteristics, behaviours and risks associated with alternative investments: hedge funds (single and fund of funds); crypto currencies; non-fungible tokens

6.1 Hedge Funds

Hedge funds seek to eliminate or reduce market risk and capture returns through manager stock selection skill, regardless of market conditions. They achieve this by combining long and **short positions** in a portfolio of carefully selected securities, without predicting or relying on the direction of the broader market. That is, they hedge market risk. The concept of profiting regardless of directional market movements is core to the hedge fund concept.

However, there are a wide range of complex hedge fund structures, many of which place a greater emphasis on producing highly geared returns than controlling market risk.

6.1.1 Key Features of Hedge Funds

Some other features of hedge funds are:

- **Structure** – most hedge funds are set up either as private partnerships in the US or as unauthorised collective investment schemes in offshore financial centres. An investment bank, known as a prime broker, typically provides the fund with trading and credit facilities as well as administrative support, while fund management is usually conducted in a major financial centre such as New York or London.
- **Regulation** – hedge funds are usually domiciled in an offshore financial centre such as the Cayman Islands or Dublin, and are usually subject to a light-touch regulatory regime. Hedge funds are largely unregulated, and are able to undertake a wider range of deals than would be allowed for a regulated product. As a result, hedge funds can have a higher level of risk than traditional assets, but they also have the potential for higher returns. Their performance can be largely uncorrelated to other asset classes for long periods of time.
- **Investment flexibility** – hedge funds have complete investment flexibility in terms of where, how and in what assets they decide to invest. In addition to taking long and short positions in securities, hedge funds can also take positions in commodities, currencies and mortgage-backed securities (MBSs).
- **Gearing** – hedge funds typically make use of gearing (or leverage) to enhance returns and they may also use more sophisticated investment strategies, such as derivatives. As a result, hedge funds can have a higher level of risk than traditional assets, but they also have the potential for higher returns.
- **Dealing** – many hedge funds impose an initial lock-in period of one to three years before investors may deal in the hedge fund's shares. Any dealing that subsequently takes place is then usually only permitted at the end of each month or quarter.
- **High investment entry levels** – the minimum initial investment into a hedge fund ranges somewhere between $100,000 and $1 million. Most hedge funds also impose a limit on the size to

which they can grow, to keep the fund nimble. For this reason, they are generally used by wealthy individuals or entities, such as pension funds or insurance companies.

- **Low correlation to world securities markets** – despite the greater concentration of their portfolio holdings, hedge funds usually provide additional diversification when combined with conventional portfolios, owing to their low correlation with world equity and bond market movements. However, the extent to which the inclusion of a hedge fund diversifies the risk of a portfolio containing traditional assets is wholly dependent upon the hedge fund's chosen investment strategy. Further, the correlation between hedge funds and traditional investments can increase markedly when a major event or shock occurs in the financial markets.
- **Performance related fees** – hedge funds typically levy an annual management fee of 2%, in addition to a performance-related fee of 20% if an absolute performance target exceeding the risk-free rate of return is met and previous losses have been recovered – this fee structure is referred to as 'two and twenty' (or 2/20). Other fee structures are also common in the industry.
- **Manager investment** – hedge fund managers are further incentivised by being expected to invest some of their own wealth into the fund. This reinforces the alignment of manager and investor interests.

Hedge funds are included in benchmark indices, such as the MSCI PIMFA Private Investor Index Series. Further, hedge funds can be a single fund or a fund that invests in other hedge funds.

6.1.2 Specific Risks of Hedge Funds

Specific risks include:

- Gearing is used widely, which can magnify gains but also losses.
- Settlement is **over-the-counter (OTC).**
- Currency risk.
- Dealing delays.
- Illiquidity.
- Lack of visibility on portfolios.
- Fraud – eg, misleading statements which result in investors falsely believing that the hedge fund is suitable for their needs, or false information about its performance.
- Lack of independent trustee boards, which can lead to conflicts of interest, insider trading and other fraudulent practices.

To mitigate some of these risks and broaden the appeal of hedge funds, several fund management groups have chosen to launch them as UCITS-compliant funds.

6.2 Managed Futures Funds

Managed futures within a portfolio are actively managed by professionals as an alternative investment by institutions and funds. They offer exposure to a range of instruments that can be tailored to hedge risk, by being negatively correlated to an existing portfolio.

Two of the most common futures strategies are:

- market-neutral – aiming to profit from mispricing using arbitrage, and
- trend-following – being long or short to take advantage of market movements.

6.3 Cryptoassets

A cryptoasset is a digital asset that does not require intervention by a middleman and uses decentralised distributed ledger technology (DLT). DLT enables the storage, distribution and exchange of value between users, either privately or publicly.

One example of DLT is blockchain. Since it was the first fully functional DLT, blockchain is more well-known than DLT itself. Blockchain consistently grows as 'completed' blocks (the most recent transactions) are recorded and added to it in chronological order, and this allows market participants to keep track of digital currency transactions without central record-keeping.

The growth in the use of cryptoassets has largely been driven by individuals and unregulated companies, which raises questions about the level of oversight and proper controls in the cryptoassets market. While these new assets and technologies may present an efficient way of carrying out financial transactions, they also bring an increased risk of fraud, money laundering and the financing of terrorism because the markets for these assets are less regulated than traditional capital markets.

Cryptocurrencies (eg, Bitcoin) are virtual or electronic currencies that use encryption techniques to regulate and limit how many units of currency are available.

6.3.1 Cryptocurrencies

Cryptocurrencies are perhaps the most well-known and longest established form of cryptoasset. A digital asset or 'virtual currency', cryptocurrencies are designed to work as a medium of exchange. They use strong cryptography (decentralised technology) in order to secure all financial transactions, control the creation of all additional units, and verify the transfer of any assets.

Unlike physical currencies, such as sterling and the euro, cryptocurrencies do not have any central 'control' such as a central bank (eg, the BoE or the ECB). Instead, they operate through decentralised controls, using a distributed ledger, typically a blockchain where these transactions are verified/audited by what is known as 'mining'.

Cryptocurrency exchanges are online (eg, Coinbase and Binance), although some also have a physical operation. These exchanges function in a very similar way to brokers that are found in the cash FX markets, since their main function is to match buyers and sellers of their specific cryptocurrency at an agreed price and amount. In most cases, they do not hold either party's funds; however, some act as digital currency providers (DCPs), which enables them to hold an investor's cryptocurrency holdings in their online account or 'wallet'.

Since 2016, regulation of cryptocurrency exchanges has increased, starting with those operating within the EU. In 2018, the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC) also started to require some type of registration for exchanges operating in the US. Other countries have since restricted the use of cryptocurrencies or banned it altogether, including China, Qatar, Egypt, Bangladesh and Zimbabwe. Regulation of cryptocurrency markets remains a developing area, and various global and political events have had – and continue to have – an impact on the regulatory landscape.

While cryptocurrencies may go up in value, they are high risk and speculative, so it is important that investors understand the risks before they start trading:

- **Volatility** – cryptocurrency values can fluctuate dramatically, sometimes by hundreds, or even thousands of dollars.
- **Decentralised** – many cryptocurrencies operate on decentralised networks, whereby investors deal directly with each other. This often results in lower volumes and liquidity.
- **Unregulated** – cryptocurrencies are largely unregulated by both governments and central banks.
- **Not reserve-backing** – they are not backed by any tangible assets or reserves.
- **Scalability issues** – mining is energy-intensive and requires extensive computational resources.
- **No investor protection** – cryptocurrencies are often not covered by compensation schemes, so investors are not protected in the event of losses due to scams, hacks or theft.

6.3.2 Meme Coins

Meme coins are a relatively new type of cryptoasset. Unlike traditional cryptocurrencies designed for payments or decentralised finance, meme coins are often created to follow trends, incorporate humour and to try to build a sense of community to attract users. Popular examples include Dogecoin (created as a joke on the popular 'Doge' meme featuring a Shiba Inu dog) and Shiba Inu (launched as a playful rival to Dogecoin), which have seen extreme price fluctuations driven by viral trends and speculative trading.

While some meme coins have built strong communities and ecosystems, most lack intrinsic utility and are highly volatile. Their rise reflects broader herd behaviour and the 'fear of missing out' (FOMO) in the cryptoassets market, where investors chase short-term gains. Despite their speculative nature, meme coins highlight the power of internet culture in shaping financial markets and the evolving role of digital assets in speculative investing.

6.3.3 Non-Fungible Tokens (NFT)

Generally, with alternative investments, investors end up with a tangible item such as a painting, an antique or a collection of coins. Non-fungible tokens (NFTs) are like physical collectors' items, except they are digital.

More specifically, NFTs are unique digital tokens in the blockchain network. Each NFT can be associated with a particular physical object or a digit asset, along with a licence to use that asset for a specific purpose.

The term 'non-fungible' means the item is unique and cannot be replaced with something else. In other words, each NFT token is uniquely identifiable – this is one of the key differentiating features of NFTs from cryptocurrencies, where all units of a particular cryptocurrency are of equal value. Another difference is that, unlike cryptocurrencies, NFTs do not possess intrinsic monetary value; rather, their value is based on what another investor is offering to pay for it.

Let's consider an example: Twitter CEO Jack Dorsey's first tweet. The tweet, written at the launch of Twitter in 2006 and reading *'just setting up my twttr'*, sold for $2.9 million in 2021. A unique piece of computer code (ie, the non-fungible token) was attached to the downloaded tweet. The NFT is

then stored on a database (ie, the blockchain) to prove asset ownership. The NFT could therefore be considered as being the cyber version of a deed to a house or a piece of land – you cannot take the house or land with you, so you are handed a deed that signifies you own it.

NFTs can be traded and sold on digital markets. However, ownership of an NFT does not inherently grant copyright or intellectual property rights to the asset that the token represents.

Risks of NFTs

There are several risks associated with NFTs, including:

- Similar to cryptocurrencies, NFTs are vulnerable to theft by hackers, cyber threats and online fraud risks. NFTs and NFT stores may look authentic, but they may actually be counterfeit/fake.
- The seller of the NFT may not actually own that NFT. In which case, the buyer may only receive the right to use that NFT, but not the intellectual property rights.
- NFTs are not regulated, so investors are unlikely to be protected by a protection scheme (eg, the FSCS in the UK) in the event that something goes wrong.
- The value of an NFT will depend on the creativity, uniqueness, scarcity of the buyers and owners, among other factors. It is therefore difficult to determine their value.
- There is no legal definition of a NFT. This is necessary in order for rules and regulations to be set, in order to protect investors.

Scarcity

The creator of an NFT gets to decide the scarcity of their asset. The intended scarcity of the NFT matters and is up to the creator. A creator may choose to make each NFT completely unique to create scarcity, or they may decide to produce several thousand replicas. Remember, this information is all public.

For example, consider a ticket to a sporting event. Just as an organiser of an event can choose how many tickets to sell, the creator of an NFT can decide how many replicas exist. Sometimes, these are exact replicas (eg, 5,000 general admission tickets); and sometimes, several are minted that are very similar, but each slightly different (eg, a ticket with an assigned seat). In other cases, the creator may want to create an NFT where only one is minted as a special rare collectible.

Whichever approach is chosen, each NFT would still have a unique identifier (like a bar code on a traditional 'ticket'), with only one owner.

Royalties

Some NFTs automatically pay out royalties to their creators when they are sold. While this concept is still developing, it holds significant potential. The process is completely automatic, so creators can earn royalties as their work is sold from person to person. Currently, figuring out royalties is often a very manual process and prone to inaccuracies; as a result, many creators do not get paid what they deserve. With an NFT that has royalties programmed into it, creators are guaranteed to never miss out on their share.

7. Real Estate

Learning Objective

5.6.1 Know the main investment characteristics, behaviours and risks associated with property investment

Property, as an asset class, is unique in its distinguishing features:

- **Heterogeneity** – each property is unique in terms of location, structure and design, the property market can be segmented into an infinite number of individual markets.
- **Subjective valuation** – properties are not traded in a centralised marketplace (due to their heterogeneity), and continuous and reliable price data is unavailable. The valuation is influenced by various subject factors, such as complex legal considerations and high transaction costs.
- **Illiquidity** – properties are not easily traded, making them highly illiquid.
- **Indivisibility** – properties can only be purchased in whole units, which limits the ability to diversify.
- **Finite supply** – the supply of land is finite, and its availability can be further restricted by legislation and local planning regulations. Therefore, price is predominantly determined by changes in demand.

The risks associated with property investment include:

Property risk

- Location of the property.
- The effect of the use of the property on its value.
- The credit quality of the tenants.
- The length of the lease
- Liquidity

Market risk

- The effect of changes in interest rates on valuations.
- The performance of individual property sectors.
- The prospects for rental income growth.

Investment vehicle risk

- Liquidity of indirect investment vehicles.
- Diversification of the underlying portfolios.
- Level of gearing.

It is difficult to track 'bricks and mortar' property fund performance and measure the risk of property funds, due to nondaily revaluation of the underlying assets, even if the fund is daily priced. This means volatility measures like standard deviation are less credible.

7.1 Types of Property Investment

Investors can access property investment through both direct and indirect methods, each with distinct characteristics and risks.

- **Direct investment** involves owning physical properties, which generally offer stable long-term returns through rental income (typically subject to upward-only rent reviews) and capital appreciation (ie, the increase in the property's value over time). While both elements tend to provide steady growth over the long term, they may experience short-term fluctuations due to market conditions. This form of investment is highly illiquid.
- In contrast, **indirect investment** includes financial instruments such as shares in property companies, property funds and real estate investment trusts (REITs), all which offer more liquidity but can be subject to equity market volatility. For example, shares in property companies (eg, housebuilders) are correlated with broader stock market movements, as well as company-specific factors such as construction delays or project quality.

Investors must have an understanding of these differences in characteristics, behaviours and associated risks when considering property as an asset class.

7.1.1 Property Unit Trusts

Property unit trusts are like conventional unit trusts, except that they invest in property other than securities. Due to the nature of the underlying assets, property unit trusts cannot qualify as authorised unit trusts (AUTs). As a result, they are typically structured as unauthorised unit trusts (UUTs), which do not have the same regulatory protections as AUTs.

7.1.2 Property Authorised Investment Funds (PAIFs)

Property authorised investment funds (PAIFs) are tax-efficient vehicles in the UK that invest mainly in property. To qualify as a PAIF, the fund must meet several conditions – eg, it must be structured as an OEIC, and at least 60% of the net income of the PAIF must be from the exempt property investment business. This structure allows the fund to pay gross dividends from property rental income with no corporation tax deducted. Thus, PAIFs are more tax-efficient for investors with wrappers that do not deduct tax as it arises from an investment (eg, pensions).

Under the PAIF regime, distributions to investors are split into three categories of income:

- **Property income distributions (PIDs)**, which are taxed at source as property rental income in the hands of the investor. Certain classes of investors (eg, charities, UK companies and pension funds) can register to receive these payments gross.
- **Other taxable income (bank interest and non-UK dividends)**, which is taxed as interest income if the PAIF is at least 60% invested in bank deposits or bonds issued by property companies.
- **Dividend income**, which is taxed as an ordinary dividend if the PAIF invests in equities.

For the interest income and dividend elements, investors' personal allowances (eg, the personal savings allowance (PSA) and dividend allowance (DA)) can be used to minimise the tax liability, after which investors are taxed at their marginal rates. These allowances cannot be applied to PIDs.

7.1.3 Long-Term Asset Funds (LTAFs)

As covered in chapter 1, section 3.1.1, LTAFs were introduced in 2021 to address the liquidity challenges faced by open-ended, directly invested property funds. While investors can redeem shares or units in these funds at any time, it can take several months (if not years) from initial marketing to completion of contracts to sell the underlying properties, in order to raise the required cash to pay investors when they redeem their units/shares. By allowing for longer notice periods and more flexibility in managing illiquid assets, LTAFs aim to mitigate these issues, and provide a more efficient way to invest in long-term, illiquid property assets.

It is worth noting that closed-ended funds and open-ended, indirectly invested property funds do not have this liquidity issue:

- **Closed-ended funds** have a fixed number of shares in issue that are traded on the stock market (ie, they do not accept any new money or redemptions). An investor who wants to cash in their position sells their shares to another investor, so the underlying assets do not have to be sold to fund redemptions.
- For **open-ended**, indirectly invested property funds, the manager sells the underlying property shares (which are liquid assets) in the stock market.

7.1.4 Property ETFs

There is a range of ETFs that track the performance of real estate indices around the world without the manager selection risk or benefit of an investment fund. Note that property ETFs are unlikely to invest in actual bricks and mortar; instead, they usually give access to housebuilders, construction companies, and/or real estate investment trusts (REITs).

With a wide variety of property indices available, ETFs can provide investors with exposure to property trends on a global and regional basis. These products could be used to complement investment in domestic property markets and bring diversification benefits or provide a mechanism to invest in a particular region that is expected to outperform.

Property ETFs are traded on the stock exchange, as with other ETFs, so offer the benefits of liquidity and should trade close to their NAV.

7.2 Yield on Property Investments

Learning Objective

5.6.2 Be able to calculate the yield of a property investment

The calculation of the yield on a property investment is not dissimilar to calculation the yield of a bond.

The yield is calculated using:

- the annual rental income from the capital investment, and
- the capital value.

7.2.1 Gross Rental Yield

The gross yield measures the income return on an investment before the deduction of expenses. It is calculated as follows:

$$\text{Gross rental yield } (\%) = \text{Annual rental income}/\text{Property value}$$

7.2.2 Net Rental Yield

The net yield calculation takes into account the expenses that are deducted from the income return. These expenses are operational costs associated with managing a rental property, which can be quite significant – they can include property taxes, management fees, buildings insurance, maintenance and upkeep costs, acquisition or transactions fees.

The net yield is calculated as follows:

$$\text{Net rental yield } (\%) = (\text{Annual rental income} - \text{Operational costs})/\text{Property value}$$

7.3 International Approaches to Property Valuation

Learning Objective

5.6.3 Know internationally accepted approaches to property valuation: RICS Global Standard; Red Book International Valuation Standards Council (IVSC) International Valuation Standards (IVS); Association of Real Estate Funds (AREF) guidelines

7.3.1 RICS Global Standards: Red Book

Founded in 1868, the Royal Institution of Chartered Surveyors (RICS) is a global professional organisation that aims to promote and enforce high international standards for valuing, managing and developing land, real estate, construction and infrastructure.

The RICS Appraisal and Valuation Standard (also referred to as the Red Book) contains mandatory rules and best practice guidance for RICS-registered valuers undertaking asset valuations. According to RICS,

> *'The Red Book is issued as part of [their] commitment to promote and support high standards in valuation delivery worldwide. [...] The Red Book also offers a useful reference resource for valuation users and other stakeholders'*[4].

4 RICS, 2024. Red Book. Retrieved from https://www.rics.org/uk/upholding-professional-standards/sector-standards/valuation/red-book/ (Accessed: January 2025)

The Red Book is updated regularly to reflect market changes and developments. The latest update was released in November 2024, when several important changes were made to maintain its alignment with evolving global standards[5]. Among these updates, the Red Book now includes enhanced provisions to address the impact of environmental, social, and governance (ESG) factors in property valuations, thus ensuring that RICS-registered valuers take into account sustainability considerations and risk factors that may affect property values. This update also aligns the Red Book with the latest International Valuation Standards (IVS), which is covered in section 7.3.2 below. This update strengthens the consistency, transparency and confidence in valuations that the Red Book has long been known for, while also adapting to the changing landscape of the real estate market.

While the Red Book helps to standardise valuations, it is important to note that even when RICS-registered valuers adhere to these standards, the value of a property and the price it ultimately sells for may differ. This can be due to imperfections in market information (ie, the seller may know more than the buyer, or vice versa), or varying market opinions about the property's future prospects and the performance of the market.

In addition to mandatory standards, the Red Book also includes Valuation Practice Guidance Applications (VPGAs), which focus on applying and implementing the global standards in specific contexts. Unlike the above-mentioned standards, VPGAs are not mandatory, but advisory. However, they do alert members to relevant mandatory material in the Red Book and provide cross-reference to the applicable IVS. The Red Book is fully compliant with the IVS.

7.3.2 The International Valuation Standards Council (IVSC) International Valuation Standards (IVS)

The **International Valuation Standards Council (IVSC)** is an independent, not-for-profit organisation that sets global standards and technical guidance for the real estate valuation profession.

Central to the IVSC's mission is to raise standards of international valuation practice as a core part of the financial system to benefit capital markets and the public interest.

The IVSC's International Valuation Standards (IVS) is a framework of high-quality standards for undertaking valuations; thus, the IVS serves as the key guide for valuation professionals globally to underpin consistency, transparency and confidence in valuation practices. The IVS are currently used by valuation professionals in almost 100 countries worldwide.

The IVS are comprised of seven 'General Standards' and eight 'Asset Standards':

- The **General Standards** set requirements for the conduct of all valuation assignments, including establishing the terms of a valuation engagement, bases of value, valuation approaches and methods, and reporting.
- The **Asset Standards** include requirements related to specific types of asset valuation, including background information on the characteristics of each asset type that influence value, and additional asset-specific requirements regarding common valuation approaches and methods used.

5 RICS, November 2024. New RICS Global Red Book updates mandatory standards for data management technology and ESG. Retrieved from https://www.rics.org/news-insights/new-rics-global-red-book-updates-mandatory-standards-data-management-technology-esg-valuation (Accessed: January 2025)

7.3.3 Association of Real Estate Funds (AREF)

The Association of Real Estate Funds (AREF) is a not-for-profit trade association that aims to establish industry standards and promote best practices in corporate governance and transparency.

One of AREF's key aims is to ensure that its fund members offer consistently high-quality products and services to investors through adherence to its Code of Practice. The Code outlines a framework for good corporate governance within real estate funds, and aims to promote consistency and comparability between funds. This is divided into three categories: governance of the fund, operation of the fund, and unit dealing and performance reporting. Further, compliance with the framework is structured at two levels: a minimum level of compliance, which all funds are required to meet; and a best practice level, which funds are expected to adopt wherever possible.

Membership of AREF gives individuals in the real estate industry a voice, allowing them to discuss and debate key issues, challenges and opportunities that they face. At the time of writing, AREF has over 50 Affiliate members, a number of Associate members and hundreds of Investor members in the industry, spanning from leading fund management houses to smaller, specialist boutiques, with a collective net asset value of over over £50 billion[6].

In November 2024, AREF has been in discussions with the British Property Federation (BPF) and Investment Property Forum (IPF) about a potential merger[7], with the aim of creating a unified voice for the real estate sector. A combined organisation would strengthen the collective influence of these groups in policy advocacy and representation, thereby enhancing their ability to address emerging industry challenges such as sustainability, regulatory changes and a post-pandemic recovery. It would also offer expanded resources and networking opportunities for members, ensuring that the real estate sector is better positioned to meet evolving market demands.

7.4 Global Real Estate Sustainability Benchmarks (GRESB)

Learning Objective

5.6.4 Know sustainability measures for real estate investment: Global Real Estate Sustainability Benchmarks (GRESB)

The Global Real Estate Sustainability Benchmark (GRESB) is an investor-led organisation that, as its name suggests, assesses and benchmarks the ESG performance of real assets. It was launched in 2009 by a group of large pension funds, who wanted access to comparable and reliable data on the ESG performance of their real assets (eg, energy efficiency), while also being able to monitor progress within the real estate sectors towards global sustainability goals. GRESB was also intended to serve as a catalyst for environmental engagement in real estate investments.

The rating provided by GRESB is an overall measure of how well the management and practices of companies and funds are integrating ESG issues. Property type and geography are not considered;

6 AREF, 2025. Membership. Retrieved from https://www.aref.org.uk/membership.html (Accessed: January 2025)

7 The Association of Real Estate Funds, November 2024. Real estate bodies in talks to create new industry powerhouse. Retrieved from https://www.aref.org.uk/resource/241104-real-estate-bodies-in-talks-to-create-new-industry-powerhousev3-docx.html (Accessed: January 2025)

rather, the rating is calculated relative to the global performance of all reporting entities. Today, GRESB covers over 2,000 property companies, REITs, funds and developers with $8.8 trillion of assets under management[8]. Data that is reported to GRESB by these companies (and so on) is validated and then scored by a third party, before GRESB then uses it to generate ESG benchmarks for the real estate and infrastructure industries.

The GRESB framework is aligned with the United Nations' Sustainable Development Goals (SDGs), which are 17 goals that the UN has identified will transform the world for the better. Defined by the UN as *'the blueprint to achieve a better and more sustainable future for all'*, essentially the SDGs are a to-do list for all governments, companies, and other organisations, in addressing a range of global challenges by 2030. For example, SDG 11, 'Sustainable Cities & Communities', seeks to *'make cities inclusive, safe, resilient and sustainable'* through career and business opportunities, safe and affordable housing, and improved urban planning and management.

Additionally, GRESB is aligned with the Paris Climate Agreement (a legally binding climate change agreement on all countries of the international community, which was adopted in 2015), among other major international reporting frameworks. As new taxonomies are being developed, GRESB is actively working to ensure it remain aligned with these evolving standards.

Thus, GRESB allows its investor members to understand and measure the performance of their portfolios or individual assets against the most materially relevant ESG metrics, based on self-reported data.

To avoid the worst impacts of climate change, the international community set a goal of reaching net-zero emissions by 2050 (which, generally speaking, refers to cutting greenhouse gas emissions to as close to zero as possible, in order to limit temperature increases to within globally-agreed limits). As governments, cities and individual companies plan for the future, it is clear that transitioning to a sustainable world is a challenge that everyone must face together.

8. Foreign Exchange Characteristics

Learning Objective

5.7.1 Know the main investment characteristics, behaviours and risks associated with currency investment

8.1 Main Investment Characteristics

Foreign currencies are an asset class in their own right, not merely a medium of exchange for purchasing other assets. Unlike equities or bonds, currencies are primarily traded in the foreign exchange (FX) market, the largest segment of the global financial markets. The volume of transactions that occur daily in this market reflects its significant role in the global economy, with billions of dollars exchanged across various currency pairs.

8 GRESB, 2024. Real Estate Standard and Reference Guide. Retrieved from https://documents.gresb.com/generated_files/real_estate/2024/real_estate/reference_guide/complete.html (Accessed: January 2025)

As an asset class, foreign currencies have unique characteristics:

- **Liquidity** – the FX market is highly liquid, with transactions occurring 24 hours a day, five days a week. This allows investors to enter and exit positions easily.
- **Market size** – the FX market is the largest financial market in the world, with a daily trading volume of about $6.6 trillion a day.
- **Global reach** – currencies reflect the economic conditions, interest rates and political stability of their respective countries, making them globally significant.

8.2 Investment Behaviours

Currency investment behaviours can differ based on the investor's strategy, whether for speculation, hedging or investment diversification:

- **Speculation** – when an investor buys or sells foreign currencies with the expectation of profiting from price movements, this is considered to be speculation. For example, an investor who buys Australian dollars by selling US dollars is betting on the future appreciation of the Australian dollar relative to the US dollar. This is similar to purchasing shares in a company or the bonds issued by a government, such as Ireland or Spain: both involve making an investment based on expected future performance, albeit the risks and mechanics differ.
- **Hedging** – more traditional reasons for engaging in currency transactions are centred around hedging FX risk, with the aim of limiting risk and reducing volatility. For example, some fund managers hedge their foreign currency exposure by using instruments or strategies such as forward contracts, foreign currency options and futures, and currency swaps. This is especially important for businesses or investment funds that have global exposure and want to mitigate future currency fluctuations. Investors need to be aware, though, that not all funds automatically hedge their currency exposure; the extent of any hedging (if applied) will depend on the fund's strategy and objectives.

8.3 Risks of Currency Investment

Currency investment carries specific risks, many of which are influenced by the characteristics of the FX market itself including its volatility, liquidity and interest rate dynamics:

- **Exchange rate risk** – exchange rate fluctuations can lead to gains or losses based on how the currency moves relative to others. For example, an investor who holds Japanese yen and anticipates appreciation may suffer if the yen depreciates unexpectedly.
- **Volatility** – currencies can be particularly volatile due to factors such as political instability, economic changes or global market events. While emerging market currencies are often more volatile than their developed market peers, it is not uncommon for developed market currencies to experience significant volatility too, often due to shifts in interest rates, economic indicators or geopolitical events. This volatility makes it difficult to predict and hedge currency movements effectively.
- **Liquidity risk** – while the FX market is generally liquid, certain currency pairs can experience periods of illiquidity, widening the bid-offer spreads and making it harder to execute trades at desirable prices.
- **Cost of hedging** – it may not be cost-effective or practical for the fund manager to hedge all currencies to which the fund is exposed.

- **Hedging effectiveness** – foreign currency risk can be reduced, although not completely eliminated. The effectiveness of these strategies depends on market conditions, the particular currency being hedged, and the instrument used. In some cases, the cost of implementing these strategies may outweigh the benefits, particularly in less liquid markets.

Example

Consider an emerging markets fund as an example. Such a fund could have investments across regions such as China, India, Brazil and Vietnam, each of which has its own currency and associated currency risk. Hedging these currencies could be costly due to wide bid-offer spreads and high transaction costs in less liquid markets.

Additionally, the volatility of emerging market currencies may make it difficult to maintain effective hedges. In some cases, the fund manager may choose not to hedge certain currencies if they believe that the long-term growth potential of those economies outweighs the short-term risks of currency fluctuations.

8.4 Short-Term Currency Swaps for Speculation

Along with vehicles such as futures, options and forward agreements, currency swaps are another method that enables a speculator to speculate on the future directions of two key variables in the FX market:

- **forward exchange-rate** spreads
- the changes in interest rate differentials between the prevailing short-term base rates in each of the countries of the currency pair.

In a swap transaction involving a currency pair, the buyer gains and a seller loses when the primary currency interest rate increases relative to the secondary currency interest rate. More specifically, it is the ratio between the two rates that matters: if the ratio increases from the perspective of the primary currency, the buyer of the primary currency will gain, and the seller of the secondary currency will lose.

9. Commodities

Learning Objective

5.8.1 Know the main investment characteristics, behaviours and risks associated with commodities

A commodity is a raw (or primary) product. For example:

- agricultural products (such as livestock, grain and fruit)
- energy products (such as oil and gas), and
- metals (such as copper and aluminium).

Commodity derivatives are based on commodities, distinguishing them from financial derivatives, which are based on financial instruments or financial data.

The commodity derivatives markets provide market participants with similar instruments to those available in the financial markets (eg, futures and options).

The earliest commodity contracts predate the establishment of formal exchanges such as the Chicago Board of Trade (CBOT), which was founded in 1848. In fact, commodity contracts were used by farmers in ancient civilisations, where they traded the rights to future harvests in order to secure prices and manage risk. The CBOT played a key role in standardising the process and expanding its use to a broader range of commodities.

When dealing in the commodity derivatives markets, several factors need to be considered. For example, agricultural markets are heavily influenced by the growing cycle of crop and by weather conditions. Some of the main global commodity derivatives markets, with examples of some of their contracts, are:

- **CME Group** – the CME Group is split into two main exchanges:
  - the CBOT for agricultural and soft commodities, gold, metals and ethanol, and
  - the CME for energy products including gas oil, crude oil and natural gas, as well as base and precious metals.
- **Euronext Derivatives** – soft commodities (eg, cocoa, sugar and coffee) and agricultural commodities (eg, wheat, corn and barley).
- **Dubai Mercantile Exchange** – crude oil.
- **ICE (Intercontinental Exchange)** – crude oil, iron ore, refined energy products, natural gas, and soft commodities (eg, cotton, cocoa, coffee and wood).
- **LME** – base metals, steel rebar, some precious metals, minor metals (cobalt and molybdenum).

9.1 Soft and Hard Commodities

Commodities are often split into two broad categories: soft and hard. In general, soft commodities are agricultural products, while hard commodities generally relate to metals. We will now consider each category in turn.

9.1.1 Soft Commodities ('Softs')

'Soft commodities', or 'softs' for short, is a term primarily used to describe agricultural products (eg, wool, cotton, wheat, soya beans, coffee, sugar, cocoa and other foodstuffs) and livestock (eg, pork, cattle and poultry).

Investment Characteristics

Soft commodities have several key characteristics that differentiate them from other types of commodities:

- **Renewability and seasonality** – many soft commodities are grown, meaning that they are renewable on an annual cycle. They are therefore subject to seasonal fluctuations, which infludences their supply and price.

- **Perishability** – with limited shelf lives, soft commodities must be stored or sold quickly. This creates challenges in storage and distribution, and adds to their price volatility.
- **Weather dependence** – weather events such as droughts or floods can reduce supply, leading to price spikes.
- **Geopolitical impact** – geopolitical events, such as trade policies or conflicts, can disrupt supply chains and affect the prices of soft commodities. For example, Russia's invasion of Ukraine in 2022 led to a global shortage of grains, and concerns about a global food crisis.

Investment Behaviours

Soft commodities are traded for hedging, speculation, and as part of broader investment strategies.

Hedging is common among producers, such as farmers, who use futures contracts to lock in prices for their crops. This helps to reduce the risk of price fluctuations due to weather events or market fluctuations. Processors also hedge against rising raw material costs by securing prices for the commodities that they need.

Speculation plays a major role in soft commodity markets. Investors (including hedge funds and institutional traders) buy and sell futures based on anticipated price movements, often driven by supply and demand expectations. This speculation can add liquidity to the market, but may also increase volatility, particularly during uncertain conditions.

Soft commodities also serve as a diversification tool, and a hedge against inflation or economic instability. They often rise in value during periods of crisis, so they offer investors a potential buffer from broader market risks. Investors can gain exposure via futures contracts or commodity-focused funds.

Government policies such as trade restrictions, tariffs and subsidies can also impact supply and demand dynamics, and these changes can then prompt investors to adjust their strategies.

Risks

The risks associated with soft commodities can include the following:

- **Price volatility** – soft commodities are highly volatile due to factors such as weather conditions, crop yields, geopolitical events and supply disruptions.
- **Supply chain risks** – being perishable, soft commodities are sensitive to logistical challenges. If transportation networks are disrupted (eg, due to natural disasters or strikes), this can disrupt distribution and cause price spikes.
- **Weather risks** – adverse weather patterns directly impact production levels, which can lead to significant price volatility.
- **Geopolitical risks** – political instability (eg, government interventions, sanctions or embargoes) can restrict supply and affect prices. Conversely, large buyers may influence prices through purchasing policies.
- **Economic risks** – economic downturns or shifting consumer preferences can influence demand for certain commodities, leading to price fluctuations. For example, a recession could reduce demand for luxury items such as coffee or sugar, while cultural shifts may alter preferences for certain meats or crops.

Supply and Demand Dynamics

The price influence on soft commodities can be summarised by supply and demand factors:

- Supply is the amount of the particular commodity available in the market. Several factors impact supply including land usage, weather conditions, disease, technological improvements, and the availability of transportation and storage facilities.

  The greater the number and diversity of sources for a particular soft or agricultural commodity, the more stable the supply. For example, if cocoa is grown in multiple locations, harmful weather in any one location will have less impact on overall production.

- Demand reflects the need for a particular commodity, which can be driven by factors such as population growth, changes in consumer preferences, industrial usage and economic conditions. For example, demand for coffee may increase in markets where coffee consumption is rising due to a growing middle class, while the demand for pork can be affected by shifts in dietary preferences or cultural factors.

  Additionally, demand is often influenced by whether countries have a deficit or surplus of the particular commodity. Other contributing factors include the wealth of the population, economic and industrial growth, consumer tastes and habits, and government policies such as tax incentives.

A strategic factor that influences a commodity's price is whether the producer countries have formed a 'producer organisation' or cartel. If a large majority of those producing countries are a member of such an organisation, then the fact that the commodity is available from a multiple of locations will have less of an impact – this is because member producers often agree to maintain a minimum price, which is made possible by the fact that each member adheres to a maximum production level that they sell on the global market. However, the success of these producer organisations depends on its members abiding to the production level agreement.

Politics can also influence prices, as governments may refuse to sell its commodity to certain importing countries based on foreign policy. Therefore, a multiple price of the same commodity might exist on the global market. This can also work in reverse, where a large buyer or importer of a commodity has a policy of refusing to trade with a specific production. If this importer is a large buyer, its action will have a strong influence on that commodity's market price.

9.1.2 Hard Commodities

Hard commodities are finite resources that require substantial capital expenditure to extract them from the ground. A wide variety of metals are produced worldwide and subsequently refined for use in different industries, with derivatives introduced for most of the major metals.

Main Investment Characteristics

The main investment characteristics of hard commodities include the following:

- **Finite supply** – as hard commodities are limited in availability, prices can be volatile as demand fluctuates and extraction rates slow down over time.

- **Capital intensive** – extracting hard commodities requires significant upfront capital investment for mining and infrastructure development. These costs can be a barrier to entry for new producers and affect the profitability of existing producers.
- **Global demand** – hard commodities are used in a wide range of industries including manufacturing, technology, construction and energy. Demand for hard commodities is tied to economic growth, industrialisation and technological advancements.
- **Exchange-based trading** – trading is concentrated on three exchanges: the London Metal Exchange (LME), the CME Group exchanges and the Shanghai Futures Exchange (SHFE). These exchanges compete on an increasing number of metals, and are continuously exploring ways in which to improve market liquidity and transparency.

Investment Behaviours

Hard commodities are traded for various purposes: hedging, speculation and, in certain cases, as a safe-haven investment.

Producers of hard commodities, such as mining companies, actively use the market to hedge their production. This allows them to lock in prices for the metal that they expect to produce in the future, thereby reducing the risk of price fluctuations that could hurt their profitability. This helps to provide more predictable revenue streams and stabilise cash flows amid market volatility.

On the other side of the market, investors (particularly hedge funds and institutional investors) engage in speculation by buying and selling metal futures based on their expectations of future price movements. These investors may anticipate price increases due to rising demand or supply constraints, and aim to profit from these movements. Speculation can increase market liquidity, but may also cause short-term price fluctuations (particularly if large positions are taken or if sentiment shifts quickly).

Precious metals, especially gold, are traditionally viewed as safe-haven assets in times of economic uncertainty. During periods of market turbulence or downturns, investors tend to flock to gold as a reliable store of value: it has a long history as a medium of exchange and a method of wealth preservation. The gold price therefore often rises during these periods as demand for security and stability increases; hence, it often serves as a barometer of broader economic conditions. Additionally, central banks hold significant reserves of gold as part of their foreign exchange reserves to protect against currency risks and economic instability.

Risks

Like softs, the risks associated with investing in hard commodities can vary significantly depending on the specific type of commodity in question. Some common risks that are broadly shared among hard commodities include:

- **Price volatility** – hard commodities are subject to significant price fluctuations due to changes in supply and demand, geopolitical events and broader economic conditions.
- **Geopolitical risk** – many hard commodities (especially energy products), are heavily influenced by political factors such as conflicts, trade policies, sanctions and shifts in government regulations, which can disrupt supply chains and cause price fluctuations.
- **Environmental risks** – environmental regulations can impact costs and production levels.

- **Regulatory and taxation risk** – changes in government policies, such as taxes and tariffs, can affect the profitability and availability of certain commodities.
- **Market liquidity** – not all hard commodities have the same level of market liquidity. Lesser-known, for example, may challenge investors who are trying to enter or exit positions.
- **Currency risk** – since most commodities are priced in US dollars, fluctuations in exchange rates can affect profitability, especially for non-dollar-denominated investors.

Supply and Demand Dynamics

As with soft commodities, metal prices are influenced by supply and demand dynamics. Factors influencing supply include the availability of raw materials, and the costs of extraction and production. Producers will measure the cost of extraction against a metal's price – if the marginal cost of mining exceeds the metal's current market price over a prolonged period, then production may stop.

This follows the basic economic principles: that marginal cost must equal the price in order to clear the market. The cost of the marginal tonne of metal produced is usually equal to the operating costs of higher-cost miners; those miners producing at lower costs than the marginal cost will accrue profits. Non-extraction costs (eg, royalties, taxes, political stability and environmental legislation) also affect profitability.

Demand for metals comes from:

- **Producers**, who use the market for hedging their production.
- **End users** – for example, the growing demand for metals in rapidly industrialising economies, such as China and India.
- **Investors**, such as hedge funds, who might buy metal futures in anticipation of excess demand or incorporate commodities into specific funds.
- **Central banks**, which hold large reserves of precious metals, particularly gold, as part of their foreign exchange reserves. Traditionally, the price of precious metals (such as gold, which is seen as a safe haven) will rise in times of crisis.

Like softs, all hard commodities have holding or warehousing costs associated with taking delivery and holding the commodity. As with all other costs of carry, the longer that an investor holds the asset (commodity), the higher the holding cost. These costs can impact both the willingness of producers and investors to hold the commodity and, ultimately, the market price.

Finally, metals used in packaging, such as aluminium and tin, are influenced by the price of alternatives such as glass and plastic, and by consumer and government concerns about sustainable resources and recycling. These factors can alter demand for certain metals, particularly in industries focused on reducing environmental impacts.

Environmental and Social Considerations

To avoid the worst consequences of global warming, economies will rapidly need to transition to low-carbon technologies. In terms of generating energy, this would mean replacing fossil power with renewable sources, such as solar and wind energy; and making batteries to store that energy. One challenge, though, is that the key materials used to make solar panels and wind turbines (eg, copper)

and batteries (eg, lithium and cobalt) have to be mined, which can have environmental and social impacts (eg, water and air pollution, and mining under conditions that violate human rights).

Energy Products

Energy is a key sector of hard commodities, encompassing both refined oil products and natural gas products. Like other markets, the price of energy is primarily influenced by supply and demand factors.

- Supply is finite, with countries possessing surplus oil and gas reserves able to export to those with insufficient resources to meet their requirements. Prices could be raised by producers restricting supply, as seen with the actions of the major oil producers within the Organisation of the Petroleum Exporting Countries (OPEC).
- Demand for energy is largely determined by consumption levels, which are driven by levels of consumption, which in turn is driven by energy needs (for example, from the manufacturing and transport industries). Europe's largest energy exchange, the Intercontinental Exchange (ICE), lists a wide range of crude oil, refined oil and natural gas contracts.

Energy prices can react sharply to political crises, particularly in major oil-producing regions, such as the Middle East. Furthermore, since demand is closely linked to the economic growth of consuming countries, economic forecasts and economic data can also significantly impact prices. Prices also react quickly to changes in supply disruptions caused by factors such as adverse weather or accidents, such as oil spills from offshore sources.

Oil refers to both crude oil and various fractions produced during the refining process (eg, naphtha, butane, kerosene, petrol and heating oil).

Crude oil is defined by three primary factors:

- Field of origin – for example, Brent, West Texas, Dubai.
- Density – ie, light or low density versus heavy or high density.
- Sulphur content – ie, sweet or low sulphur, versus sour or high sulphur.

Environmental legislation can affect the market share of different types of crude oil. For example, effective from 2020, the International Maritime Organisation (IMO) lowered its global limit on the sulphur contained in shipping fuel (known as bunker) from 3.5% to 0.5%. This change led to some refineries shifting away from consuming sour crude oils in favour of sweeter crudes to comply with the new standards. As a result of the reduced demand for sour crudes, the price discount relative to sweet crudes widened.

10. Infrastructure

Learning Objective

5.9.1 Know the main investment characteristics, behaviours and risks associated with infrastructure

10.1 Main Investment Characteristics

Infrastructure refers to the essential physical and organisational structures that are needed for a society and economy to function. Traditionally, this includes assets such as roads, railways, airports, ports, hospitals and schools, which provide the foundational services and facilities necessary for daily life. Over the years, the scope of infrastructure investment has expanded to include new and emerging sectors such as technology and digital infrastructure (eg, data centres and broadband networks), renewable energy (eg, solar and wind farms) and environmental infrastructure (eg, waste management and water treatment), to reflect the growing demand for diverse solutions as the economy evolves.

Generally, individual investors cannot directly invest in infrastructure assets as these projects typically require significant capital investments. However, they can gain exposure indirectly through various investment vehicles. Infrastructure funds may invest in a wide range of asset types, allowing investors to access different parts of the sector – eg, in the shares of infrastructures companies, debt issued by infrastructure projects or companies (including bonds issued by governments or private firms to finance infrastructure projects), and hybrid strategies that invest in both equities and debt. Additionally, direct infrastructure funds invest directly in physical infrastructure assets.

Types of Infrastructure Fund	
Equity funds	These funds invest indirectly by targeting infrastructure companies. Their returns will be more closely correlated with the equity market; however, they are often defensive in nature, and can offer a steady and consistent yield.
Debt funds	These funds invest in debt securities issued to finance infrastructure projects, such as bonds or loans issued by governments or private infrastructure companies. These funds can provide regular income with potentially lower volatility compared to equity funds, but typically offer lower growth potential.
Direct funds	These funds invest directly in infrastructure projects, such as the building of schools or hospitals, as well as 'green' and technology/digital infrastructure, among other areas. They may target a single country or be international in nature. Direct funds may target mature opportunities (which are lower risk, as they are already operational) or earlier-stage projects that are more capital intensive (which are higher risk).

10.2 Investment Behaviours

The above-mentioned differing constructions can affect the risk profile, returns and liquidity of the investment, as each type may have varying levels of volatility, income potential and long-term capital appreciation. The type of asset (eg, traditional infrastructure, technology or renewables) and the investment vehicle (open-ended versus closed-ended) also have an impact. Investors therefore must carefully consider how these factors align with their investment objectives, risk tolerance and time horizon.

The attraction of infrastructure funds is that they offer higher yields than corporate bond funds, with the added benefit of relatively low volatility (particularly in sectors with stable, long-term cash flows). Like all investments, though, the degree of yield and volatility will vary depending on the specific fund's strategy and the underlying assets.

10.3 Risks

While infrastructure funds are generally perceived as offering lower risk compared to more volatile asset classes, they are still subject to market risks, economic cycles and changes in government policy.

Further, the liquidity of some infrastructure funds may be limited, so investors could face delays in redeeming their holdings.

10.4 Fund Structures

10.4.1 Open-Ended Infrastructure Funds

As already discussed, open-ended funds allow investors to buy and sell units or shares at the net asset value (NAV). This can make them more liquid, but may also expose them to market fluctuations if large amounts of capital are invested or redeemed.

With open-ended funds, investors must be aware of the impact of dual pricing and single pricing for unit trusts and OEICs. Unit trusts typically use dual pricing and may move their pricing to an offer or bid basis. For more information on offer and bid basis, see section 2.1.3 of this chapter.

Due to the illiquid nature of direct infrastructure projects, open-ended funds that are directly invested in these projects may require investors to commit their capital for long periods of time, so that the planned investments have time to deliver their expected returns.

10.4.2 Closed-Ended Infrastructure Funds

Closed-ended funds can be well-suited to long-term investments in illiquid assets, such as direct infrastructure projects, which might not be easily traded in an open market. This is because shares in closed-ended funds are bought and sold between investors on the secondary market, without the need for the fund manager to sell the underlying assets (this contrasts with open-ended funds, where the manager may need to liquidate assets to meet investor redemptions).

As a result, the closed-ended structure is naturally better suited to holding illiquid assets, as this allows them to be managed for long-term growth without being forced to sell the assets prematurely. This can be advantageous, as the fund does not need to realise assets at potentially distressed prices to meet redemptions.

At the same time, such funds often use leverage. This can amplify gains, which is beneficial for infrastructure assets due to their stable, long-term cash flows, inflation-linked revenues and high asset values. However, it can also magnify losses if the assets do not perform as expected.

Closed-ended funds often have a fixed number of shares, which raises potential liquidity issues, particularly whether there will be sufficient buyers and sellers to enable the shares to be readily traded. Additionally, these funds can trade at a premium or discount to the NAV, which can affect investors' ability to buy or sell at the desired price. These issues become more pronounced with smaller and more specialist trusts, such as those targeting niche investment strategies like infrastructure. Some closed-ended funds may not be traded on a stock market, in which case periodic redemptions (which some closed-ended funds offer) may provide investors with a way to realise all or part of their investment.

10.4.3 Infrastructure ETFs

Over the years, various infrastructure indices have been developed to measure the performance of infrastructure company shares listed on a country's main stock exchange. These indices can cover a wide range of regions, subsectors and specific segments of the infrastructure market, thus providing a comprehensive view of how infrastructure-related companies are performing across different geographical areas and industries.

It follows that many infrastructure ETFs have been launched, to track the performance of these indices. These ETFs share the same characteristics as other ETFs, such as diversification across infrastructure sectors and the ability to trade on exchanges. Further, they are considered to be passive ETFs as they aim to replicate the performance of an underlying index. One key difference is that infrastructure ETFs typically have higher OCFs than 'traditional' ETFs, largely due to their more specialist nature.

10.4.4 Listed and Unlisted Infrastructure Funds

Many infrastructure funds are listed on stock exchanges, although some are unlisted.

Listed infrastructure funds invest in publicly traded infrastructure companies or assets. Listed infrastructure typically focuses on lower-risk profiles featuring stable, mature assets with predictable revenue streams that are easier to trade.

In contrast, unlisted infrastructure funds typically invest in private infrastructure projects, such as public-private partnerships (PPPs) and private finance initiatives (PFIs). Both PPPs and PFIs involve collaboration between governments and the private sector, but the key difference between them is that PPPs tend to include a wider variety of infrastructure projects, and offer shared risk between the two parties, with payments based on either availability or service quality. In contrast, PFIs are more rigid, typically involve the private sector assuming more risk, and focus primarily on long-term contracts for specific public assets (eg, schools and hospitals), with government payments based on the asset's

availability or performance. Investors typically access unlisted infrastructure funds through private equity firms or institutional investment vehicles.

Key differences between listed and unlisted funds include the following:

- **Opportunity set** – listed funds offer a broader range of investment opportunities, so provide investors with greater choice.
- **Diversification** – the listed market therefore provides more opportunities, enhancing the potential for diversification.
- **Transparency** – as part of regulated stock markets, listed infrastructure companies are required to disclose high levels of information, which ensures greater transparency for investors.
- **Liquidity** – investors in listed infrastructure funds can generally buy and sell shares at will, whereas those in unlisted infrastructure funds may face lengthy waiting periods before being able to redeem their holdings.
- **Fees** – listed infrastructure funds generally have lower fees compared to unlisted infrastructure funds, which may levy both management and performance fees.

End of Chapter Questions

Think of an answer for each question and refer to the appropriate workbook section for confirmation.

1. **Provide three items that a fund mandate will typically define.**
   Answer reference: Section 1

2. **On what basis can unit trust prices be set, and in what circumstances does the Financial Conduct Authority (FCA) require that a unit trust manager move from one pricing basis to the other?**
   Answer reference: Section 2.1.3

3. **What is a reverse ETF, and why would an investor decide to invest in such an instrument?**
   Answer reference: Section 2.3.1

4. **What are the three basic legal structures of open-ended funds?**
   Answer reference: Section 2.6

5. **An investment trust is an example of a closed-ended fund. What does 'closed-ended' mean?**
   Answer reference: Section 2.8.1

6. **What factors can an investor consider to aid the process of choosing a fund that suits their objectives, risk profile and investment time horizon?**
   Answer reference: Section 3.1

7. **Explain the relevance of reporting and non-reporting status for offshore funds.**
   Answer reference: Sections 3.13.1 and 3.13.2

8. **What are SCaRPs?**
   Answer reference: Section 4.3.2

9. **What is a green bond, and what is the attraction of green bonds to investors?**
   Answer reference: Section 5.1.1

10. **Describe the risks associated with property investment.**
    Answer reference: Section 7

11. **Why are the prices of soft commodities generally more volatile than hard commodities?**
    Answer reference: Section 9.1.1

Chapter Six

Data Analysis

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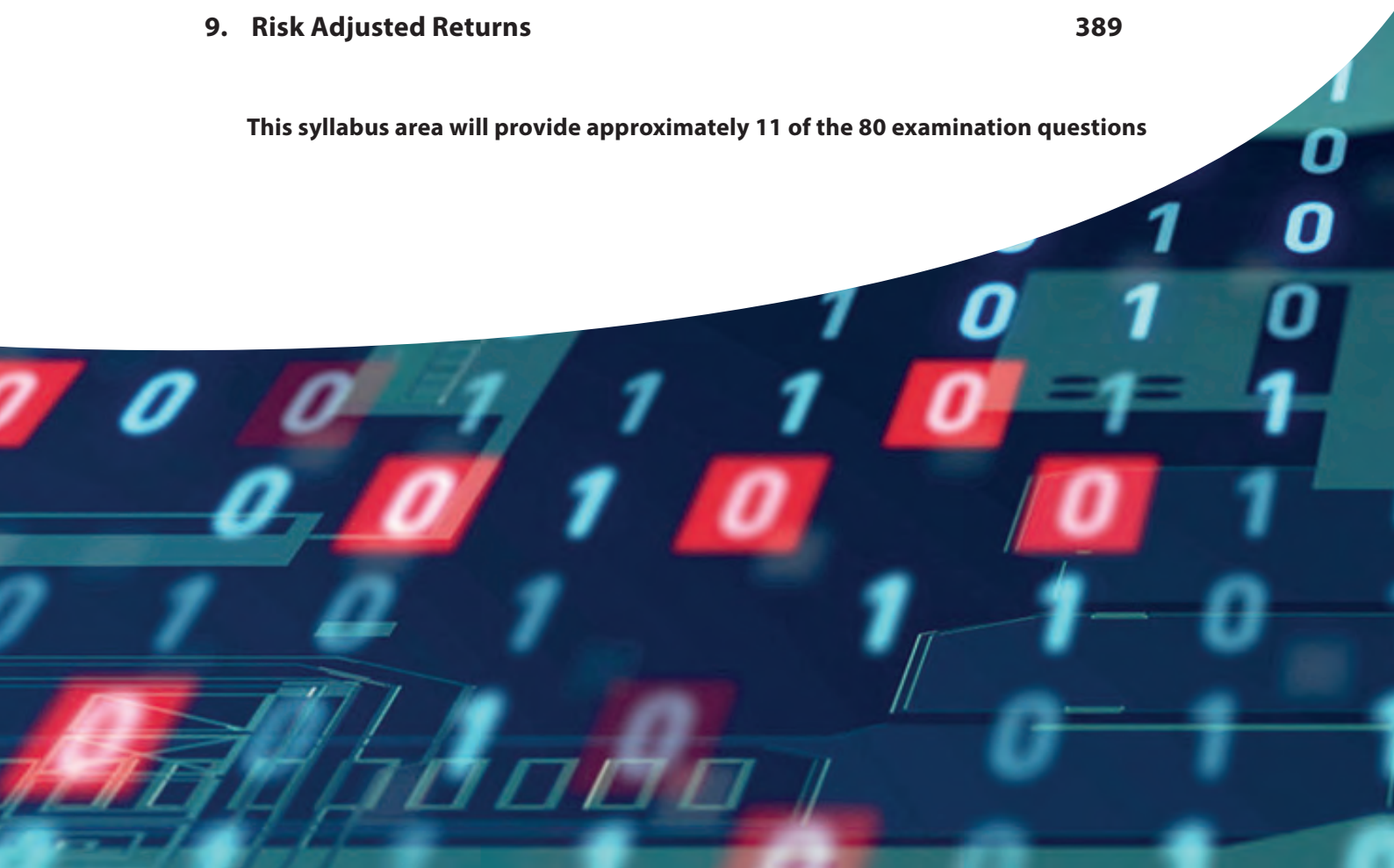
This syllabus area will provide approximately 11 of the 80 examination questions



1. Sources of Data

Learning Objective

6.1.1 Know relevant sources of data: primary sources; secondary sources; sampling; continuous and discrete; categorical data; frequency and relative frequency distribution; presentation methods

1.1 Data

The ability to source and interpret all kinds of information, both qualitative and quantitative, in a timely fashion is key to the portfolio management process. However, since information, or data, can be sourced from a variety of media, is presented in a wide range of formats and is not always in a readily usable form, becoming familiar with information sources and being able to assimilate data is imperative if informed investment decisions are to be made and investment opportunities are to be capitalised upon.

Investment decisions require an analysis and interpretation of a wide range of data. As a result, this section firstly describes the different types of data, how it is collected and how it can be presented by data providers. It then looks at some of the core mathematical calculations that are needed for investment management.

Examples of data include:

- research and reports, from a wide range of sources
- media services
- broker reports
- fund rating agencies, and
- government publications.

See chapter 1, section 8.1.1 for more details on data sources.

1.2 Categorising and Presenting Data

The data that is collected can be categorised into two main types:

- **Primary data** is information or material specifically collected for a particular purpose and the conditions under which it was collected and any limitations will be known.
- **Secondary data** is collected by government agencies and other international bodies which is then distributed in a convenient form. This data typically requires further analysis if each user is to maximise the value of the information contained within it.

Numerical data can be categorised into continuous, where numbers in a data series can assume any value, or discrete (where the numbers in the data series are restricted to specific values, such as whole numbers).

1.2.1 Populations and Samples

When dealing with data, you must be able to distinguish whether the information relates to an entire population or a sample of a population.

If a population is being considered, every member or constituent of a particular group will be included in the analysis. Examples are all constituents of the S&P 500, of the DAX 40, or of the SSE Shanghai Composite Index.

As its name suggests, a sample will only contain a subset of the population; for example, a selection of company shares from the index. The larger the sample is, the more representative it will be of the population. Often, populations become so large and cumbersome that using and making inferences from samples is the only viable and cost-effective means of analysing the population.

Samples can be either:

- **Random** – the sample is selected randomly, such that each constituent has an equal chance or probability of being included. This is typically done by using a table of random numbers to ensure that the selection is free from bias.
- **Non-random** – in this approach, a non-random method is used to select the sample. The goal is to select a sample that considered to be more representative, although the selection process may introduce some bias.

1.2.2 Data Presentation

Raw numerical data can be presented in a wide variety of tabulated and graphical formats to enhance its informational value and ease of interpretation.

Tabulated numerical data often takes the form of a **frequency distribution** table. A frequency distribution table involves categorising the number of times that something has occurred in each category of investigation. The results are arranged in order of their size and value, and may be grouped into subsets so that the information can be displayed more meaningfully.

For example, you could analyse the age range of the people working in your firm as shown below.

Age Range	No. of People
50 to 60	15
40 to 50	22
30 to 40	26
25 to 30	12
20 to 25	13
Under 20	12
Total	**100**

As a result of grouping the data, it is possible to detect patterns in the data such as how many people are employed in different age ranges. The width of the band (or interval) used will necessarily impact on the usefulness of the data and should therefore be chosen carefully.

By adding the number of times that something has occurred, it is possible to create a cumulative frequency distribution table. It looks almost the same as a frequency distribution table, but has added columns that give the cumulative frequency and the cumulative percentage of the results.

Age Range	No. of People	Cumulative Frequency	Cumulative Percentage
50 to 60	15	15	15%
40 to 50	22	37	37%
30 to 40	26	63	63%
25 to 30	12	75	75%
20 to 25	13	88	88%
Under 20	12	100	100%
Total	**100**		

Knowing how to convey information graphically is important in the presentation of statistics, as is knowing what type of graph to use.

Examples include the following:

- **Bar charts** – display information as bars or columns representing each class of data according to their frequency of occurrence; they are useful for comparing items and relationships or frequency distribution.

- **Pie charts** – a circle divided into different slices, each representing a different set of data; they are useful for describing the component parts of the data being presented.
- **Histograms** – look similar to bar graphs, but it is the area and not the height of the bar that represents the frequency of occurrence; they are often used to illustrate the major features of the distribution of data in a convenient form.
- **Time series graphs** – display data over time, such as a share price.
- **Scattergrams** – are used to determine whether there is a relationship between two variables and to illustrate a correlation or pattern between different assets.
- **Semi-log graphs** – are used to show a variable's rate of change and illustrate an accelerating rate of growth over time.

2. Measures of Central Tendency and Dispersion

Learning Objective

6.2.1 Be able to calculate the measures of central tendency: arithmetic mean; geometric mean; median; mode

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When dealing mainly with raw numerical data or with ordered numerical distributions, you must be able to make inferences about the data being considered and ideally use it to make predictions. Statistics makes this possible by drawing on what are known as measures of central tendency and measures of dispersion.

- **Measures of central tendency** provide a single value that represents the typical or central point of the distribution – ie, the value for which the other data points cluster.
- **Measures of dispersion** describe the spread of volatility of the data points within the distribution, indicating how much the values deviate from the central value.

2.1 Measures of Central Tendency

When you have a set of data and need to summarise it, you will often wish to establish an average that converts the data into a single number that you can use more usefully. The measures of central tendency help to capture a single number that is typical of the data. There are three measures of central tendency:

- **Mean** – the average value of all the data.
- **Median** – the middle item with exactly half the data above and below it.
- **Mode** – the most common number that occurs.

Mean

There are two types of mean that can be calculated: the arithmetic mean and the geometric mean.

Arithmetic Mean	Geometric Mean
The arithmetic mean is calculated by adding together all the values in a data set and then dividing that sum by the number of observations in that set to provide the average value of all the data. For example, if you have six investment funds in your portfolio that produce returns of 7%, 8%, 9%, 10%, 11% and 12%, then the average (or mean) return is: (7% + 8% + 9% + 10% + 11% + 12%) / 6 = 9.5% The mean is expressed as the following formula: Mean ($\bar{x}$) = Sum of all observations / Number of observations	The geometric mean differs from the arithmetic mean in that it involves multiplying all values in the data set, taking the n^{th} root of the resulting, and then subtracting 1 from the result. It can be useful when looking at compound changes, such as portfolio returns. For example, if a deposit of $10,000 is expected to earn 5% per annum this year, 6% next year and 5.5% in the third year, then the geometric mean can be used to calculate the average rate of return. The geometric mean rate of return is calculated as follows: $\sqrt[3]{(1+0{,}05)(1+0{,}06)(1+0{,}055)}-1$ $=0{,}05499 \text{ ou } 5{,}499\%$ The geometric mean will always be lower than the arithmetic mean. Despite this shortcoming, as shown in the above example, it has a fundamental use in portfolio management, where compounding effects are a key consideration.

Median

The median is the value of the middle item in a set of data arranged in chronological order. It is established by sorting the data from lowest to highest and taking the data point in the middle of the sequence.

Example

Consider a range of data, as below. From this, we can see median is 12, as there is an equal series of numbers both below and above it:

2	5	8	9	12	13	15	16	18
4 numbers				Median	4 numbers			

To calculate the median, you place the values in numerical order. If there is an odd set of numbers in the data set, then use the following formula:

$$\text{Median} = \frac{(n+1)}{2}$$

where n = the number of values in the data set.

Continuing with the above example, there are nine values and the median is the fifth one (ie, 12).

Conversely, if the data has an even set of numbers, then the median is equal to the average of the two middle items:

$$\text{Median} = \frac{(\text{Value below the median} + \text{Value above the median})}{2}$$

Example

Extending the range of data above, we can see that the value below the median is 12 and the value above is 13:

2	5	8	9	12	13	15	16	18	19
				Median = 12.5 $\frac{(12+13)}{2}$					

Mode

The mode is the most frequently occurring number in a set of data.

- There can be no mode if all the values in the data set appear the same number of times.
- There may be two (bimodal), three (trimodal) or four or more modes (multimodal).

Example

Consider the following house values:

£100k; £125k; £135k; £95k; and £100k. Here, the mode is £100k. As this value appears twice, the data set is bimodal.

2.2 Which Measure to Use

Several conclusions can be drawn from the above:

- The **mean** is the most commonly used measure of central tendency, but it needs to be recognised that the outlier numbers at the extremes of the data influence the result.
- The **median** is not influenced in the same way and is often used where there are extreme outliers or skewed data that is not normally distributed.
- The **mode** can be problematic as there may be no mode at all but is useful where categorical data is used, such as where a café has ten different meals on its menu and the mode would represent the most popular.

So, while both the mean and median may result in a number or value that is not contained within the distribution, the mode will always be one or more of the observed values.

However, only the mean will be influenced by any extreme values within the distribution as only the mean takes every value into account; the median and mode do not.

Influence of Skewness on Measures of Central Tendency

The relationship between the mean, median and mode depends on how evenly the values are distributed within the sample or population:

- If the distribution is symmetrical (ie, the ordered data is normally distributed) then the mean, median and mode will all be the same value.
- If the data is asymmetrical (or skewed) each measure of central tendency will produce a different value:
  - **Negatively skewed frequency** – in a negatively skewed distribution, a larger number of observed values are concentrated towards the higher end of the distribution. Hence, the mode (which always pinpoints where a frequency distribution peaks) will be greater than the median which will be greater than the mean.
  - **Positively skewed frequency** – in a positively skewed distribution, a greater number of observed values are concentrated towards the lower end of the distribution. Hence, the ordering of the mean, median and mode are reversed.

Under most circumstances, the mean tends to be a more stable measure of central tendency than the median when comparing different samples from a population. However, when distributions are highly skewed with extreme values (such as the distribution of annual investment returns over long time periods, or the distribution of household income), then the median often provides a more representative measure of central tendency. The geometric mean shares this characteristic.

2.3 Measures of Central Dispersion

Learning Objective

6.2.2 Be able to analyse data to determine the following measures of dispersion: variance (sample/population); standard deviation (sample/population); range; skew; kurtosis

Having calculated a typical value from the data available, we now need to assess how widely the data points are spread around this average. Understanding the variability of investment returns is the basis of many hedging techniques, and serves as an important indicator of portfolio performance.

We can quantify variability this through the use of dispersion measures, including the following:

- Range.
- Inter-quartile range.
- Variance.
- Standard deviation.

2.3.1 Range

The simplest measure of dispersion is the range, which is the difference between the highest and lowest values in a data set.

Example

The following numbers represent the returns from an investment fund over a ten-year period:

Year	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Return	13	11	2	6	5	8	7	9	7	6

Using the range measure, we find that the fund's returns span a range of 11 (ie, 13 – 2).

The main drawback of using range as a measure of dispersion is that it is distorted by extreme values and ignores the numbers in between. This limitation can be mitigated by using other measures of dispersion, such as the inter-quartile range, variance or standard deviation (although they too have their own limitations, as discussed below).

2.3.2 Inter-Quartile Range (IQR)

The inter-quartile range (IQR) ranks data, such as the performance returns from comparable investment funds against each other, and presents it as a series of quartiles. It then measures the difference between the first quartile (also known as the 25th percentile or Q1) and the third quartile (75th percentile or Q3), in order to provide an indication of the spread of the middle 50% of the data.

$$IQR = Q3 - Q1$$

Q1 is the median of the lower half of the data, while Q3 is the median of the upper half. If there is no exact middle value, the quartiles are calculated as the midpoint between the two closest values.

By focusing on the central 50% of the data, the IQR helps to minimise the impact of extreme values or outliers that may distort other measures of dispersion. A smaller IQR indicates that returns are tightly clustered together (ie, there is less variation in performance), while a larger IQR implies that the returns are more spread out (ie, greater variability or inconsistency).

Example

The following figures represent the returns from several comparable investment funds. The data is first ranked in order of highest to lowest, and the set is then divided into quartiles.

Fund	A	B	C	D	E	F	G	H	I	J	K	L
Return	9%	8%	7.5%	7%	6.5%	6%	5.75%	5%	5%	4.75%	4%	3.5%
Quartiles	1st Quartile			2nd Quartile			3rd Quartile			4th Quartile		
Inter-quartile range				←						→		

The value for the first quartile is 7.25% (ie, halfway between 7.5% and 7%, since the first quartile represents the midpoint of the lower half of the data) and the value for the third quartile is 4.875% (ie, halfway between 5% and 4.75%). Hence, the IQR is 2.375% (ie, 7.25% – 4.875%).

A fund with a return in the second quartile would rank in the top half of fund performances, while a fund in the fourth quartile would have delivered returns that were exceeded by 75% of the rest of the sample.

While the IQR is a useful tool for understanding the spread of the central portion of the data and minimising the influence of outliers, it excludes data points outside the range. As a result, it does not account for the full distribution – particularly the extreme values, which may still be significant in some situations. Additionally, the IQR assumes that the data is relatively symmetric around the median, which is not always the case. The variance and standard deviation measures can help to provide a more complete picture of the data's spread, by incorporating all data points (including outliers) to capture the overall dispersion of the data set.

2.3.3 Variance

Variance measures the spread of data by determining how far each data point deviates from the arithmetic mean. It is determined by first finding the difference between each data point and the mean, then squaring these differences, and summing up the results.

If calculating the variance for a population, the sum of squared differences is divided by the total number of data points (or n):

$$\text{Population variance } (\sigma_p^2) = \frac{\sum (x - \bar{x})^2}{n}$$

Alternatively, if calculating the variance for a sample, the sum of squared differences is divided by 'n – 1'. This adjustment accounts for what is called the 'degrees of freedom', which is a way to adjust for the fact

that we are estimating from a sample, not the entire population. The correction reduces the potential for sampling error, and ensures a more accurate estimate of the variance:

$$\text{Sample variance } (\sigma_s^2) = \frac{\sum (x - \bar{x})^2}{n - 1}$$

Example (continued)

The arithmetic mean for the average fund returns used in the range example above is as follows: (13% + 11% + 2% + 6% + 5% + 8% + 7% + 9% + 7% + 6%) ÷ 10 = 7.4%.

The variance takes the difference between the return in each year from the arithmetic mean and then squares it. These are then totalled and the average of them represents the variance.

This is shown in the table below. Row 2 shows the difference in the return each year from the arithmetic mean and row 3 shows this difference squared.

	Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
1	Return	13	11	2	6	5	8	7	9	7	6	
2	Difference from the arithmetic mean $x - \bar{x}$	5.6	3.6	–5.4	–1.4	–2.4	0.6	–0.4	1.6	–0.4	–1.4	
3	Difference squared $(x - \bar{x})^2$	31.36	12.96	29.16	1.96	5.76	0.36	0.16	2.56	0.16	1.96	86.34
4	Average (86.34 ÷ 10)											8.634

Variance is useful in that it provides a measure of dispersion and is used to calculate the beta of a stock, but it results in a value in different units than the original. It is obviously much easier to measure dispersion when it is expressed in the same units, and this is known as standard deviation.

2.3.4 Standard Deviation

The standard deviation of a data set is simply the square root of the variance and is the most commonly used measure of dispersion. The formula for calculating it is therefore:

$$\text{Population standard deviation } (\sigma) = \sqrt{(\text{Population variance})}$$

$$\text{Sample standard deviation } (\sigma) = \sqrt{(\text{Sample variance})}$$

Example (continued)

Staying with the above example, the standard deviation (σ) of the returns from the investment fund is the square root of the average of 8.634, which is 2.94.

Although the variances and standard deviations of both ordered raw and frequency distribution data can be calculated quickly and easily using a scientific calculator, it is useful to understand how to work through the calculation manually.

2.3.5 Normal Distributions, Skew and Kurtosis

Normal Distributions

We have already touched on the fact that data is assumed to be normally distributed; in other words, they follow a normal distribution, also known as a Gaussian distribution. This means that, under normal conditions, data points are symmetrically distributed around the mean, with most values clustering near the middle and fewer values appear as you move further away from the mean in either direction.

With sufficiently large data, the pattern of deviations from the mean will be spread symmetrically on either side and, if the class intervals are small enough, the resultant frequency distribution curve may look like the cross-section of a bell; in other words, a bell-shaped curve.

Statistical analysis shows that in a normal frequency distribution curve:

- Approximately two-thirds or 68.26% of observations will be within one standard deviation on either side of the mean.
- Approximately 95.5% of all observations will be within two standard deviations either side of the mean.
- Approximately 99.75% of all observations will be within three standard deviations of the mean.

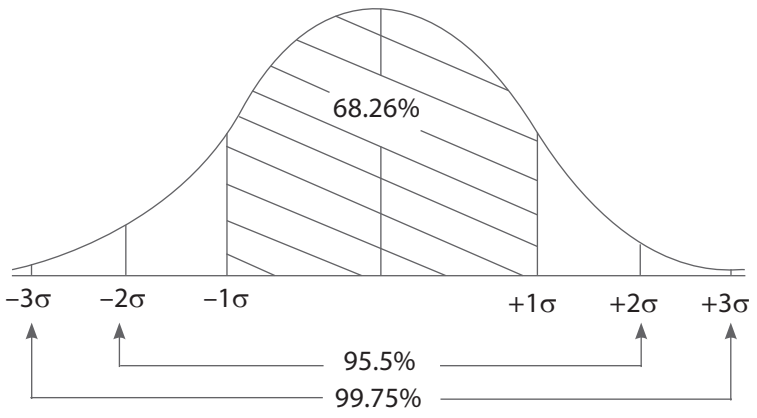
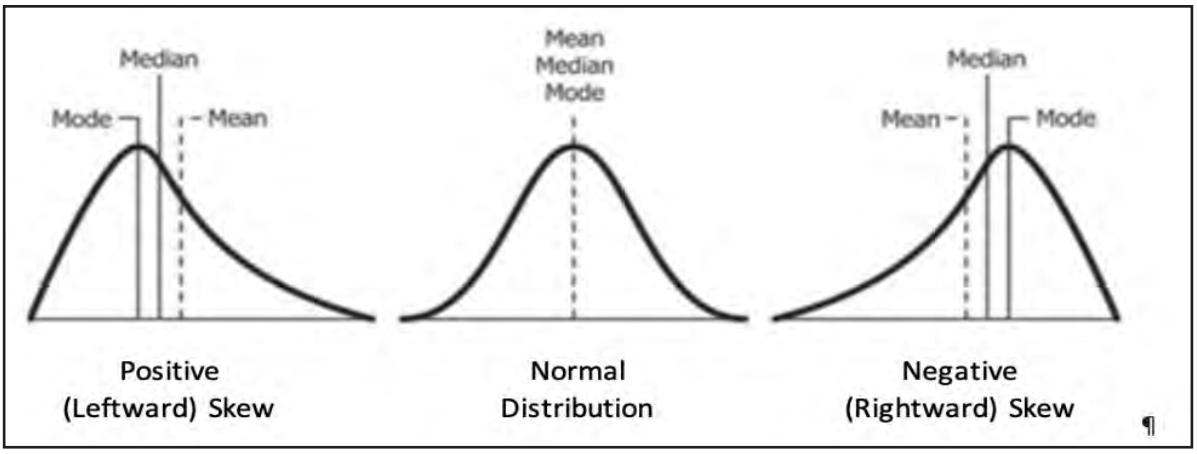


Figure 3: Normal Frequency Distribution Curve

Skew

In reality, though, data does not always conform to a normal pattern; rather, many real-world phenomena exhibit deviations from the normal distribution. This can arise for a number of reasons including external influences, complex interactions or inherent asymmetries in the underlying processes. Distribution may be spread out more to the left or right, known as skewness:

- A **leftward (or positive) skew** indicates a longer or fatter tail on the right side, suggesting that the distribution extends further to the right than a normal distribution. The mean is typically greater than the median, as the presence of a longer tail on the right pulls the mean in that direction.
- Conversely, the tail of a **rightward (or negative) skew** is longer or fatter on the left side, and the mean is typically lower than the median.



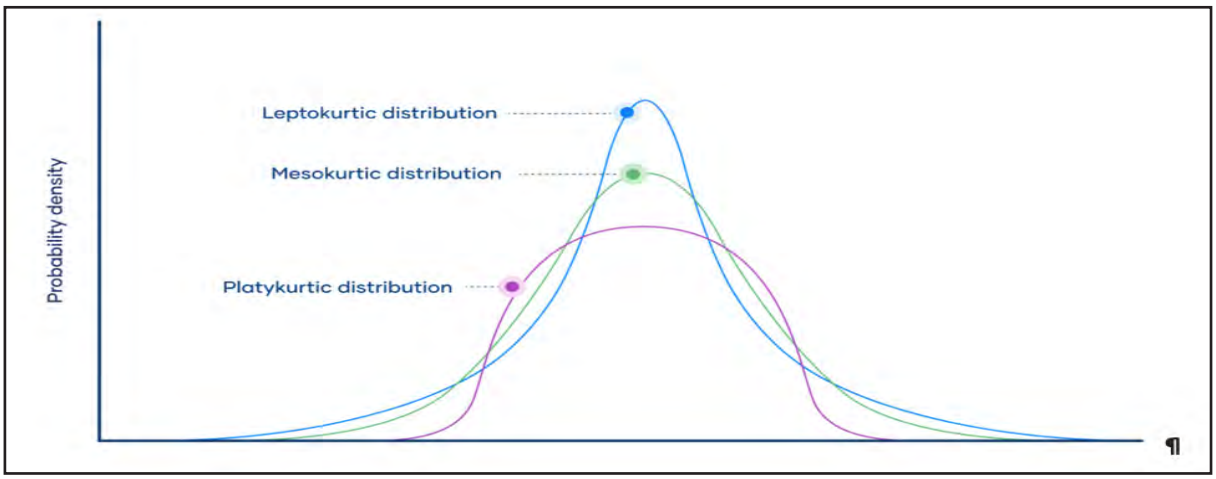
Skewness is therefore a crucial metric in instances where distributions deviate from normality. Such deviations highlight the importance of considering alternative probability distributions that better capture the unique characteristics of specific datasets and phenomena.

Kurtosis

Another important measure of the shape of a probability distribution is kurtosis, which measures the 'tailedness' of a distribution (ie, how often outliers occur).

There are three main types of kurtosis:

- Distributions with medium kurtosis (ie, medium tails) are **mesokurtic**, also described as normal kurtosis. Here, kurtosis equals 3, meaning the distribution has a similar shape to the normal distribution, with a moderate peak and tails that are neither too heavy nor too light.
- Distributions with low kurtosis (ie, thin tails) are **platykurtic**, also called light-tailed kurtosis or negative kurtosis. The distribution has a flatter peak and lighter tails than the normal distribution, suggesting the data is more spread out than a normal distribution, so it has fewer extreme values; hence, kurtosis is less than 3 (ie, kurtosis < 3).
- Distributions with high kurtosis (ie, fat tails) are **leptokurtic**. Also called heavy-tailed kurtosis or positive kurtosis, these distributions have a more pronounced peak and heavier tails than the normal distribution; hence, kurtosis is greater than 3 (ie, kurtosis > 3). The fatter tails indicate there are more extreme values.



Most long-run distributions of equity returns are positively skewed – ie, equity markets tend to produce more extreme positive and negative returns than would be expected statistically. However, the extreme positive values typically far outweigh the negative ones, thus reflecting the heavy-tailed nature of the distribution.

3. Correlation

Learning Objective

6.2.3 Be able to analyse the performance of two assets to determine: correlation; covariance

Correlation is a keystone feature of portfolio construction theory. In investment terms, correlation is an estimate of the extent to which the values of different types of investments move in tandem with one another in response to changing economic and market conditions.

Correlation is measured on a scale of -1 to +1. Investments with a correlation nearer to +1 tend to rise and fall in value at the same time, while investments with a correlation nearer to -1 are more likely to rise and fall in value in opposing cycles. The definitions of how strong a relationship is between two variables can vary greatly among investors, but broadly they are as follows:

- Correlations from 0.66 to 1 demonstrate strong relationships.
- Correlations between 0.33 to 0.66 demonstrate moderate relationships.
- Correlations between 0 and 0.33 demonstrate zero to low-level relationships.

Thus, diversification benefit is maximised by holding investments exhibiting low (ie, close to zero) correlation.

It is worth noting, though, that correlations do not remain constant – they are dynamic. Correlation changes over time and in unpredictable ways. It would be ideal if two asset classes had positive real

returns expectations and consistent negative return correlation with each other. Unfortunately, there are no such pairs of investments. Using historical data, it is only possible to forecast the correlation between two asset classes.

Mathematically, correlation and covariance are closely related statistics that measure the relationship and the dependency between two variables. The key difference between them, though, is that covariance indicates the direction of the linear relationship and the degree of co-movement as an absolute figure; while correlation measures both the strength and direction, and standardises the result to a scale of -1 to +1. Therefore, covariance is more useful when the units of measurement are important (eg, when assessing the magnitude of movement in original units, such as currency or percentages), and correlation is used for standardised comparisons (eg, comparing the strength of relationships between different datasets or asset classes).

Example

The daily returns of two stocks, stock A and stock B, have a correlation of +0.80. This indicates a strong positive relationship between the two: when one increases, the other tends to increase as well. This value reflects the consistency of their relationship over time.

If the covariance between these returns is +2, this also indicates that when stock A increases, then so does stock B. This number does not provide insight into the strength of the relationship. Instead, it shows the direction and degree of co-movement between the two stocks, based on the units of measurement and and the positive nature of the relationship.

This relationship between the two statistics means that if we know one of these values, then we can easily calculate the other:

$$Cov_{PQ} = \rho_{PQ}\, \sigma_P\, \sigma_Q$$

or, alternatively:

$$\rho_{PQ} = Cov_{PQ} / \sigma_P\, \sigma_Q$$

where:

Cov_{PQ} = the covariance of returns between security P and security Q

ρ_{PQ} = the correlation coefficient between returns of security P and security Q

σ_P = the standard deviation of security P

σ_Q = the standard deviation of security Q

4. Regression Analysis

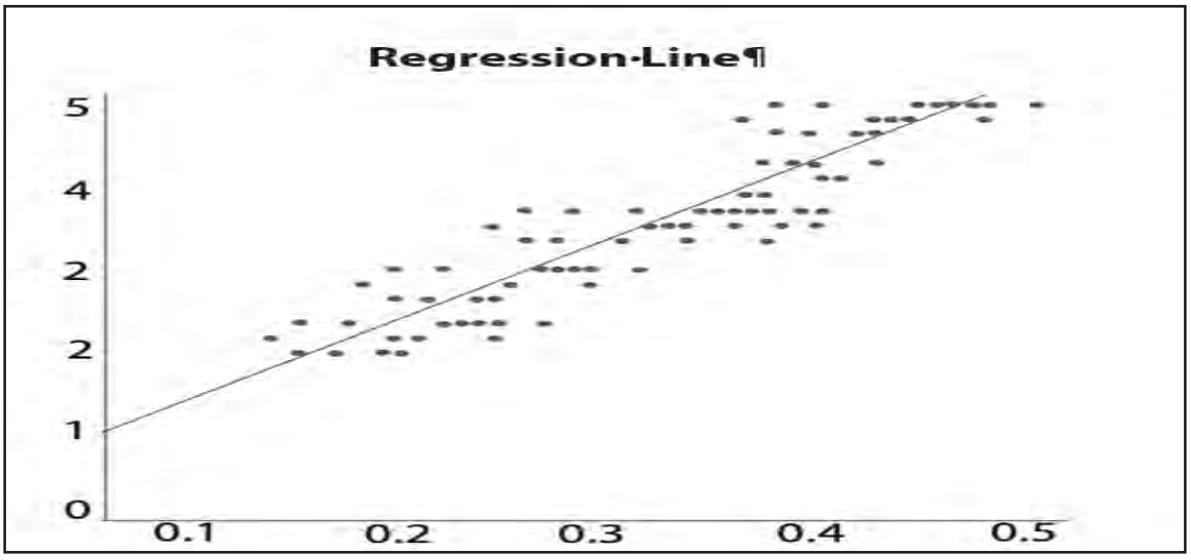
Learning Objective

6.2.4 Be able to analyse the relationship of two assets using regression analysis

Regression analysis is a statistical tool used to quantify the relationship between two variables. It helps to determine the degree to which changes in one variable (ie, the independent variable) alter another variable (ie, the dependent variable). For example, regression analysis can be used to assess how a price increase impacts demand, or how changes in the money supply influence inflation.

To conduct regression analysis, data is gathered, and a model is developed to estimate the quantitative effect of one variable on another. The statistical significance of the estimated relationship is then assessed, which indicates the degree of confidence that the observed relationship accurately represents the true relationship in the population.

A common way to explore potential relationships is to plot the data on a scatter plot, which visually displays the relationship between the two variables over time. While this can reveal patterns or trends, it does not establish causality. To determine which variable is causing the observed change, it would be necessary to carry out further analysis (eg, using additional variables or conducting tests for statistical significance).



- An upward sloping regression line, as shown above, indicates a positive relationship between the two variables – this means that as the independent variable increases, the dependent variable also increases.
- Conversely, a downward sloping regression line represents a negative relationship, where an increase in the independent variable leads to a decrease in the dependent variable.
- A horizontal line with a slope of zero suggests that there is no relationship between the variables, so changes in the independent variable have no effect on the dependent variable.

Additionally, the steepness of the slope reflects the strength of the relationship: a steeper slope indicates a stronger effect, with larger changes in the dependent variable for each unit change in the independent variable; and a shallower slope indicates a weaker effect.

5. Big Data and Artificial Intelligence (AI)

Learning Objective

6.3.1 Know the application of big data in the investment management industry

6.3.2 Know the application of artificial intelligence (AI)

5.1 Big Data

The term 'big data' refers to large, complex and growing sets of data that are difficult to manage and analyse with traditional data-processing software. The challenges with big data relate to its volume, velocity and variety (commonly known as the three Vs of big data): the sheer amount of data being generated, the speed at which that data is created, and the different forms of data create challenges in relation to its analysis, storage and security.

In financial services, firms gather vast amounts of data (including personal and sensitive data) related to clients in order to provide personalised, suitable and efficient services that meet their needs – the types of information gathered are covered in chapter 2, section 2. However, as firms increasingly rely on digital platforms to collect, store and process this data, the risks associated with its security also grow. Due to the sensitive nature of client information, data protection must be a top priority; if this data is compromised, it can lead to identity theft, fraud and significant reputational damage to the firm.

The importance of securing this data cannot be overstated. A breach of client data in the financial sector can result in severe consequences including regulatory fines, loss of customer trust and legal repercussions. Therefore, robust security measures (eg, encryption, secure data storage and multi-factor authentication) must be implemented to protect this information. Compliance with data privacy laws, such as the EU's and UK's General Data Protection Regulation (GDPR), also ensure that firms meet their legal requirements and avoid penalties.

5.1.1 Types of Big Data

Types of big data generally fall into the following categories:

- **Structured data** – this data is organised according to a specific format with pre-defined fields. As it is typically stored in tabular formats (eg, spreadsheets), it can be stored using standard database applications and is easier to process using traditional methods.

Example

The classic example of structured data is stock prices, sampled at a specific frequency (eg, daily closing prices over a ten-year period for FTSE 100 constituents). Portfolio managers can then use this data to assess performance over time, conduct technical analysis, and make data-driven decisions for buy/sell recommendations.

- **Unstructured data** – this data lacks a pre-defined structure or order, and may not contain descriptive information. It often appears as text (eg, social media posts or PDF documents), although it can also include images or other forms of multi-media. An advanced example would be data derived from machine-generated sources or complex visual data. This type of data tends to be more difficult to analyse, and requires specialised analytical tools and techniques.

Example

A single social media post from an influential personality or influencer could change prices dramatically. This has been demonstrated several times in recent years by Elon Musk's tweets about Tesla and various cryptocurrencies. Social media posts containing options, reactions or rumours about companies can be used to gauge public opinion and market sentiment.

- **Semi-structured data** – this type of data may not have a fully defined structure, but contains some level of descriptive information such as tagged images or metadata in documents. It lies between structured and unstructured data, and typically requires semi-automated systems to organise and analyse.

Example

An analyst report in a PDF may have embedded metadata identifying key metrics such as EBITDA (see chapter 3, section 3.5.1), revenue growth and market share, that can be used to quickly extract key metrics from reports for different companies within a sector or industry, thus enabling cross-company comparisons.

- **Multi-structured data** – this is a dataset combining multiple data types and formats (eg, structured, unstructured and semi-structured). The increasing integration of different data sources enables more sophisticated analysis, allowing firms to make data-driven decisions across a range of asset classes.

Example

A bank might integrate data from its customer transaction history (structured data), customer service chat transcriptions (unstructured data) and app usage logs (semi-structured data) to create a holistic view of customer behaviour, which it can then use to predict customer needs, personalise product offerings, and identify potential risks or opportunities.

If, say, a customer has frequently contacted customer service with issues related to credit card payments (unstructured data) combined with transaction history showing a high level of spending (structured data), the bank may identify a higher risk of default or offer them a tailored financial product.

5.2 Artificial Intelligence (AI)

Within the financial services industry, AI (which involves the use of 'intelligent' machines that learn from data, solve problems, and adapt over time to improve their own performance) is playing an increasingly central role, transforming traditional financial institutions and paving the way for more innovations and new operating models.

For example, AI is revolutionising the banking industry, by enhancing product and service quality. As well as optimising data management and enhancing customer experience, it also streamlines and redefines traditional processes, making them more efficient overall. Businesses can use AI to create personalised, innovate offerings based on individual preferences and behaviours; this helps to improve customer satisfaction and, in turn, enables them to stay competitive in a rapidly evolving market. Examples of AI applications include chatbots, customer relationship management, credit risk management, and fraud detection and prevention systems.

All in all, these technological advancements are making it easier for a broader spectrum of individuals to participate in the market.

At the same time, though, firms that incorporate AI into their systems must be aware of the associated risks. For example, AI algorithms may inadvertently become biased, leading to discriminatory outcomes or reinforcing existing inequalities. If not carefully monitored and adjusted, biased AI can result in unfair treatment of certain individuals or groups, which goes against principles of fairness and equality – eg, the FCA's Fair Treatment of Customers (FTOC), which requires financial services firms to treat all customers fairly and to ensure that no customer is disadvantaged by unfair practices or biased decision-making. Therefore, businesses must implement robust ethical guidelines, continuous monitoring, and regular audits to mitigate the potential biases embedded in AI systems and ensure fair and equitable outcomes for all users.

5.2.1 Robo-Advisers

AI's integration into the financial services sector has also led to the development of automated investment solutions, such as robo-advisors. Robo-advisors are digital platforms that offer automated financial and investment services, using algorithms to manage client portfolios with minimal human

interaction. Clients typically provide information about their financial situation and goals through online surveys, and the system allocates assets into a diversified portfolio. The platform continually rebalances the portfolio to maintain the target allocation, and may incorporate strategies such as tax-loss harvesting to enhance tax efficiency.

Robo-advisors are especially suited for investors who seek low-cost, simple investment solutions, whether they are beginners, busy professionals, or those preferring not to manage investments themselves. However, these platforms may not be ideal for investors who require personalised advice (as they lack the tailored, human touch offered by financial advisers) or more complex portfolios (as they might not accommodate more sophisticated investment strategies, such as those involving options). Ultimately, investors should assess their needs and goals before deciding if a robo-advisor is the right solution for their financial situation.

5.3 Data and Industry – Commercial Opportunity

While still nascent in development, there are signs that the integration of big data and AI into investment management is creating new commercial opportunities, influencing both market dynamics and investor strategies:

- **Data as a tradable commodity** – the concept of trading data as a commodity is gaining traction, particularly in the context of big data exchanges. For example, the Shanghai Data Exchange (which was established in 2016 and opened for business in 2021) facilitates the buying and selling of data, such as flight information and telecom data. This development highlights the growing recognition of data's value, as AI models become increasingly capable of extracting actionable insights from bulk data, potentially influencing investment strategies.
  As data generation continues to surge, financial services firms are exploring data monetisation as a way to create additional revenue streams. This can happen both internally (where firms use data to improve operations and productivity) and externally (by tailoring offerings to better meet customer needs). However, data monetisation carries legal and ethical risks, particularly regarding customer privacy. Clients expect their data to be securely stored, and not sold to third parties without consent. As firms increasingly rely on AI to unlock value from data, they must carefully manage these risks to avoid violating trust or legal obligations while leveraging the power of data.
- **Fintech's role in big data** – companies born out of online ecosystems, such as Alipay (which evolved from ecommerce marketplace Alibaba) and WeChat Pay (which has roots in messaging app WeChat), have pioneered the collection and analysis of big data. With vast amounts of user data – including geolocation, social media activities, personal preferences and family information – these companies are reshaping how firms assess consumer behaviour and market trends. The integration of AI into these systems enables deeper, predictive insights that go beyond traditional analysis methods, thus providing more accurate forecasting capabilities.
- **Alternative data** – the growing reliance on alternative data, generated through new technologies such as satellite imagery, online reviews and credit card transactions, highlights the increasing sophistication of investment strategies and beyond. Hedge funds were early adopters of alternative data, using it to predict market movements ahead of official reports. More recently, traditional asset managers have embraced alternative data, leveraging advanced tools such as natural language processing (NLP) and machine learning to process large volumes of complex, non-traditional datasets. These technologies allow firms to identify patterns and insights that were previously difficult to uncover, thereby providing a competitive edge in making investment decisions.

- **Corporate response to AI-driven analysis** – as AI continues to reshape the investment landscape, publicly traded companies are adapting their communication strategies. Corporate earnings calls and regulatory filings are increasingly being crafted with AI in mind, as these documents are often read and interpreted by algorithms. The rise of big data and AI in investment management is therefore prompting a new level of mindfulness about language and its potential to influence algorithm-driven buy/sell signals.
- **Big data and AI in crisis management** – Big data and AI have proven especially valuable in times of uncertainty. When traditional data sources are unavailable, AI models can process alternative data. For example, during the US government shutdown in 2018-19, agritech start-ups used satellite images and sensor data from farm machinery to provide agricultural reports when routine data from the Department of Agriculture was put on hold. Similarly, during the COVID-19 pandemic, data such as China's road congestion statistics and air pollution indicators were used to help quantify the economic impact of lockdowns.

6. Technical Analysis

Learning Objective

6.4.1 Know the basic principles underpinning chart-based analysis: overlays; oscillators

As covered in chapter 1, section 2.3, technical analysis evaluates a security's price movements and volume data to predict future price trends. Technical analysts use various quantitative and statistical tools to analyse time-series data of asset prices, behaviours and other characteristics, with the aim of identifying recurring price patterns or chart formations.

The core assumptions of technical analysis are that:

- the market discounts everything
- prices move in trends, and
- history tends to repeat itself.

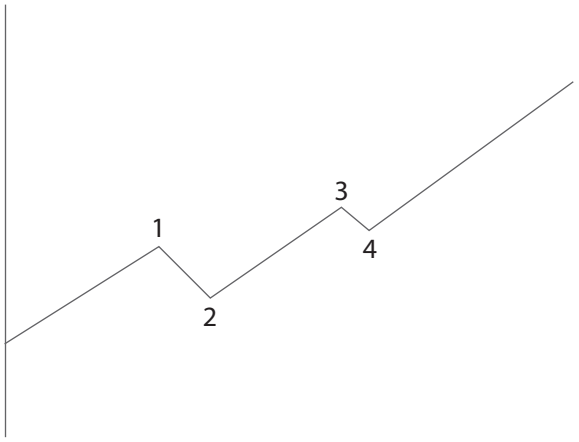
Technical analysis relies on price charts, along with technical indicators and oscillators, to identify patterns that can suggest future price movements. Indicators are calculations based on price, volume or time, used to generate buy and sell signals; and are plotted over price charts as overlays (eg, moving averages). Oscillators indicate whether a security is overbought or oversold. Unlike fundamental analysis, technical analysis is unconcerned with whether a security is undervalued; its sole focus is on predicting future price movements.

6.1 Trends in Technical Analysis

One of the most important concepts in technical analysis is the trend. However, trends can be difficult to identify, as prices do not move in a straight line. Instead, technical analysis identifies a series of highs and lows to determine the direction of movements. Trends are classified as uptrends, downtrends or sideways movements.

The following diagram illustrates a simple uptrend:

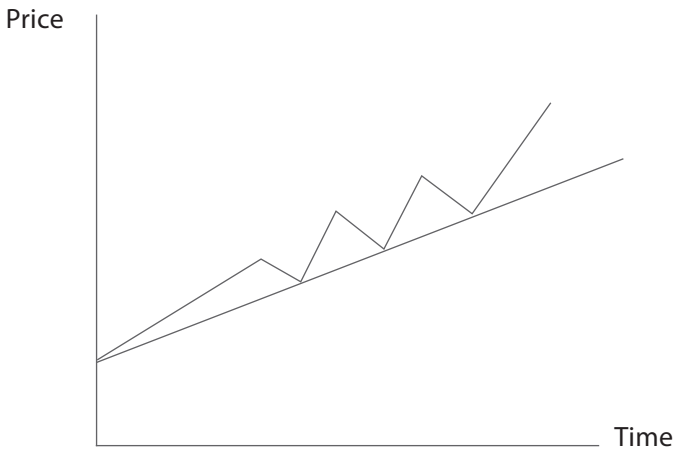
Figure 1: A Simple Upward Trend



Point 1 on the chart represents the first high, and point 2 represents the subsequent low. For an uptrend, each successive low must be higher than the previous low; if this condition is not met, then it signals a reversal. The same principle applies to downtrends.

After plotting historical price movements, a trendline is added to clearly show the direction of the trend and to show reversals. The trendline can then be analysed to provide further indicators of potential price movement. The diagram below shows an upward trend line drawn at the lows of the upward trend and which represents the support line for a stock as it moves from progressive highs to lows.

Figure 2: Upward Trendline



This trendline represents the stock level, where a stock's price is expected to move upwards again. Similarly, a downward trendline drawn at the highs represents the resistance level, where a stock faces resistance as it moves from a low to a high.

6.2 Price Movements in Technical Analysis

In technical analysis, price movements are categorised into three types: primary movements, secondary movements and tertiary movements.

- **Primary movements** are long-term price trends, which can last a number of years. Primary movements in the broader market are known as **bull markets** (a rising market).
- **Secondary movements** occur within the primary trend, and last for a few months. They can either move in the same direction as the primary trend (eg, a rally in a bull market or a correction in a bear market), or temporarily reverse the direction (eg, a pullback in an uptrend or a rally in a downtrend).
- **Tertiary movements** are the shortest-term fluctuations, often occurring daily or weekly. These are smaller price movements within the secondary trend, and can be seen as short-term noise that does not necessarily affect the broader trend.

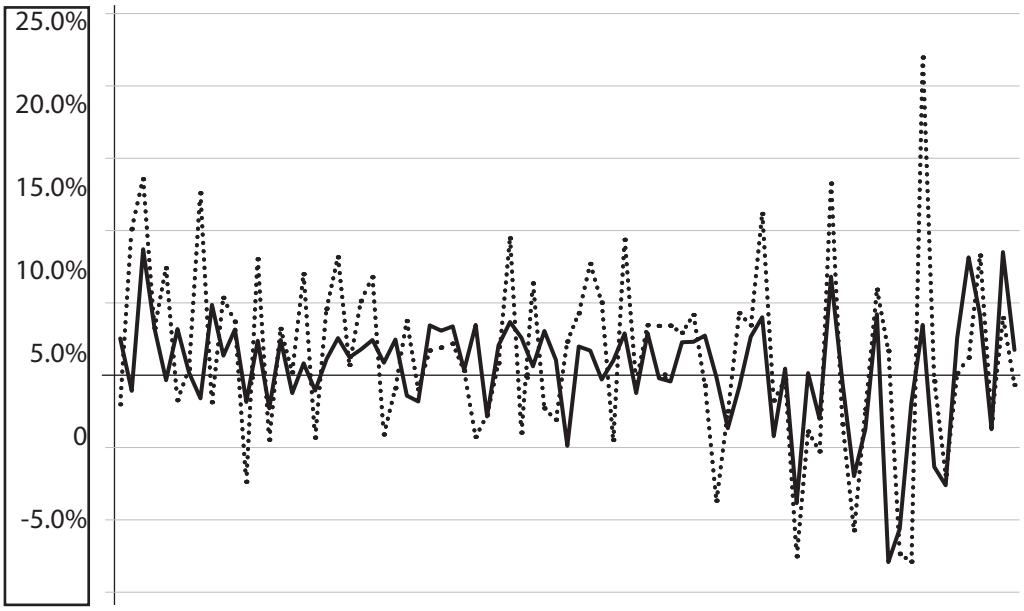
6.3 Types of Price Charts

Several types of charts can be used to depict price movements, including:

- **Line charts** – these plot an asset's price over time using a single line, typically representing the security's closing price.

  Moving averages are often used to smooth out extreme price fluctuations, thereby making it easier to identify longer-term trends. They are calculated by averaging the closing prices over a specific period; for example, a 10-day moving average takes the average of the last 10 days of closing prices. Ten, 50, 100 and 200 moving-day averages are commonly used.

  A line chart may look like the following:



- **Point and figure charts** – these charts record significant price movements using vertical columns of Xs (which indicate upward movements) and Os (to indicate downward movements), without a set

timescale. Xs are used when the price moves higher by a set amount, and Os when the price moves lower by a set amount. A new column is started whenever there is a change in the direction of the security's price. An example point and figure chart, in relation to the above line chart, is shown below:

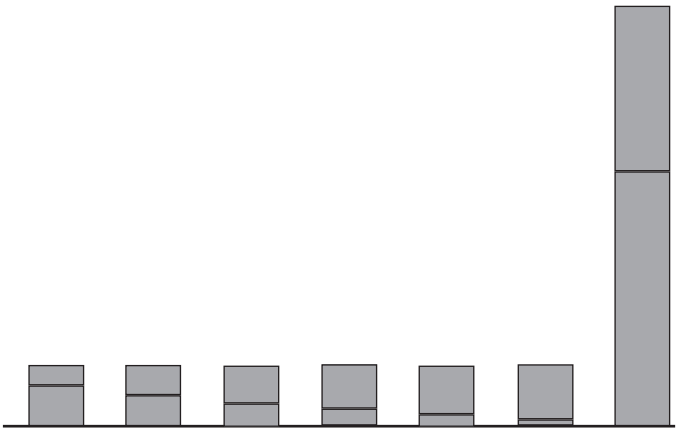
Closing Price						
130				X		
129				X	O	
128	O			X	O	
127	O			X	O	
126	O	X	O	X	O	
125	O	X	O	X	O	
124	O	X	O	X	O	
123	O	X	O	X	O	
122	O	X	O	X	O	
121	O	X	O	X	O	X
120	O	X	O	X	O	X
119	O	X	O		O	
118	O					

This example shows that prices began at 128, then fell to 118; from the line chart above, this fall occurred over a period of a few days. The price then rose to 126, before falling again to 119; and so on. All in all, this demonstrates that point and fall charts clearly highlight price movements and reversals, emphasising the direction and size of price changes without focusing on the exact timescale.

21	21.000								
22	20.000								
23	19.000					X			
24	18.000			X		X	O		
25	17.000	X		X	O	X	O		
26	16.000	X	O	X	O	X	O		
27	15.000	X	O	X	O		O		
28	14.000	X	O				O		
29	13.000 O	X							
30	12.000 O	X							
31	11.000 O								

- **Bar charts** – these charts display the highest and lowest price levels attained by a security over a specified time period by a vertical line. This timescale can range from a single day to a few months. When the chosen time period is one trading day, a horizontal line is drawn to the left of the vertical line to represent the opening price, and a second horizontal line is drawn to the right of the vertical line to represent the closing price. Further, if the closing price is higher than the opening price (indicating a price rise), the bar is typically shown in green; if it is lower (indicating a price fall), the bar is typically shown in red. An example of a bar chart, again based on the line chart shown above, is as follows:

CHART



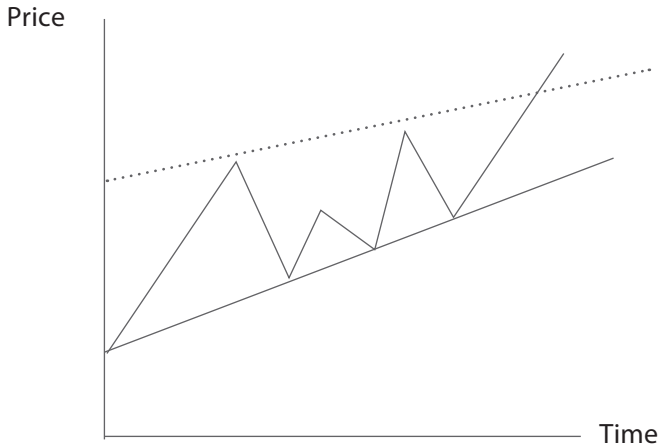
- **Candlestick charts** – candlestick charts are closely related to bar charts, but they provide additional visual information. Like bar charts, candlestick charts show the highest and lowest prices using a vertical line. However, while bar charts can use horizontal lines to indicate the opening and closing prices on either side of the vertical line, candlestick charts combine these horizontal lines into the 'body' of the candle. If the closing price is higher than the opening price on a given day, then the body of the candle is left clear (often represented as a white or green candle). Conversely, if the closing price is lower than the opening price, then the body of the candle is shaded (often represented as a black or red candle). For the above line chart, a candlestick chart would look as follows:

6.4 Technical Analysis Channels and Breakouts

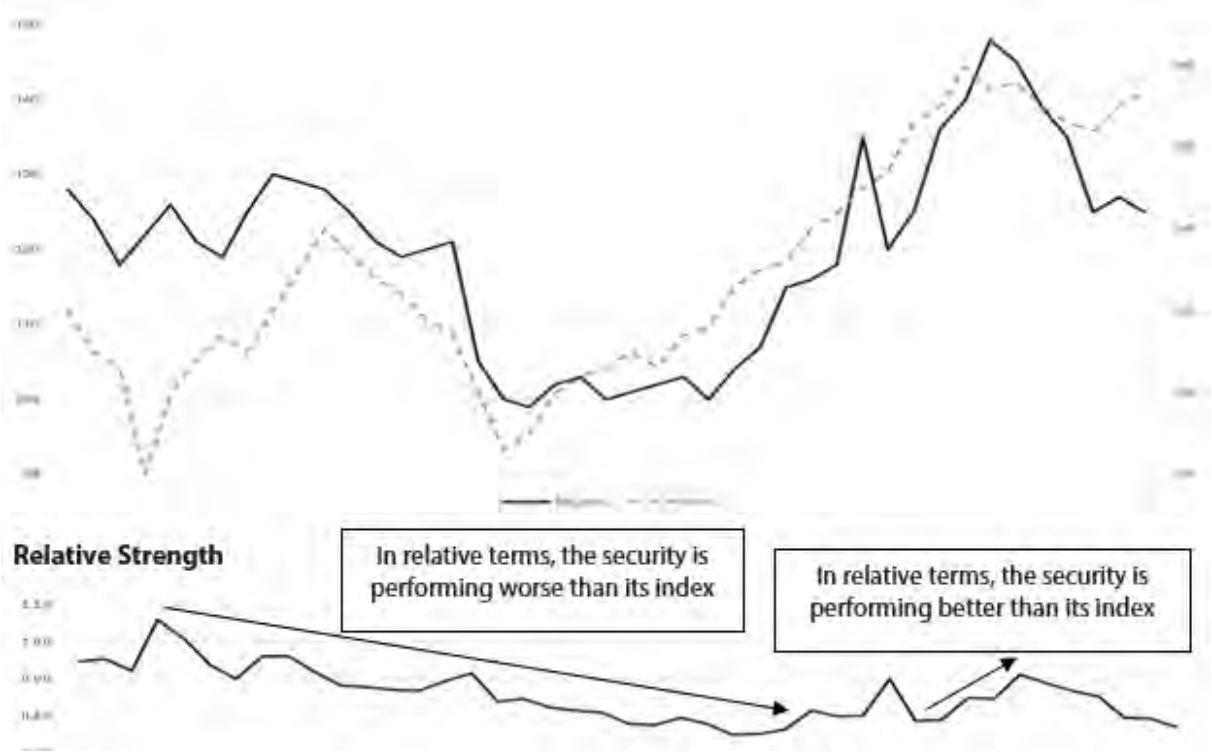
Technical analysis also contains channel lines, where two lines indicate the areas of support and resistance by connecting the highs and lows. Security prices are expected to trade between these two levels until they break out – a breakout occurs when the price moves sharply in the direction of the break, indicating a potential buying or selling opportunity.

An example of such a breakout pattern is the triangle, which can signal significant price movement, often occurring after a period of low volatility:

Figure 3: Breakout Pattern



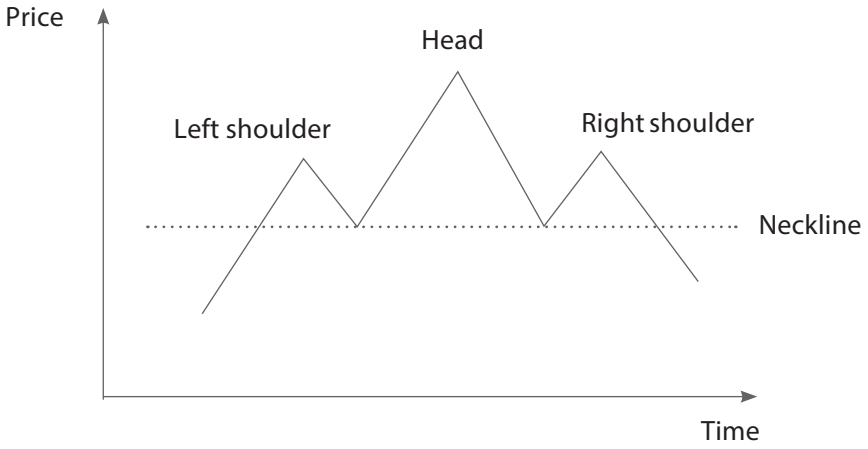
Chartists often use what are known as relative strength charts to confirm breakouts from continuation patterns. These charts compare the price performance of a security relative to the broader market. If the security's performance improves against the market, it may confirm that an upward breakout has already occurred or is likely to happen soon.



However, technical analysts recognise that prices do not always move in the same direction and trends eventually cease; hence, they also look to identify what are known as reversal patterns, or sell signals.

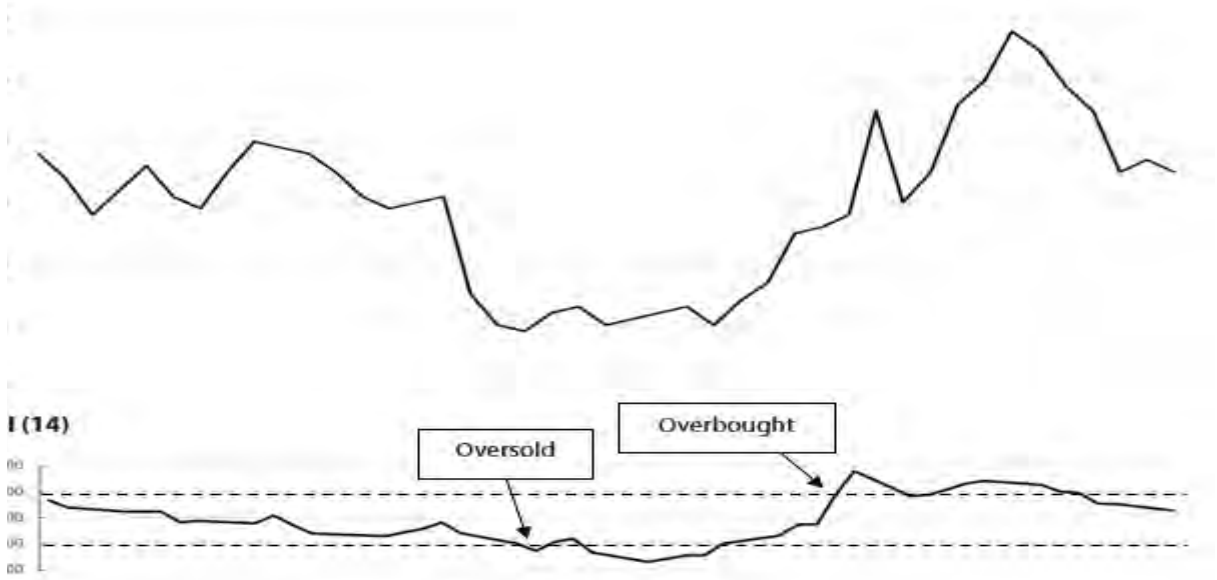
Probably the most famous of these is the head and shoulders reversal pattern. This pattern occurs when the price movement causes the right shoulder to breach the neckline (ie, the resistance level), thus signalling the potential for a sustained fall in the price of the security, as illustrated in the following chart:

Figure 4: Head and Shoulders Reversal Pattern



Technical analysts also often use relative strength indicators (RSI), which is a momentum oscillator that measures the speed and change of price movements. RSI is typically calculated using the average gain and average loss over a 14-trading-day period, with values ranging from 0 to 100; a reading above 70 suggests that the security is overbought, while a reading below 30 indicates it may be oversold. Hence, the RSI can help to confirm whether a breakout is likely to continue or if the price is poised for a reversal.

Continuing with the previous example, the top chart shows the closing prices only (not any rolling averages), and the bottom chart shows the corresponding RSI:



Here, 'RSI (14)' means that the RSI is calculated over a 14-day period.

The drop in the RSI below 30 indicates that the security has been oversold, which corresponds to a price drop to 99 in this example. Conversely, when the RSI rises above 70, the security is considered overbought, which corresponds to a price rise to 135. However, despite the price reaching an even higher point of 148 later on, the RSI does not increase as much as during the earlier rise – this is because

the RSI is a relative measure of price changes, so as prices climb higher, it becomes more difficult for subsequent gains to increase the RSI by the same degree, leading to a more subdued reading.

7. Measuring Returns

7.1 Holding Period Return (HPR)

Learning Objective

6.5.1 Be able to analyse performance to determine total return

Also called the total return or total rate of return (TRR), holding period return (HPR) is the simplest way of analysing returns. It is used when there are no external cash flows. This is the actual return (Rt) delivered by a portfolio over its holding period. Ignoring any distributions or dividends paid, the return is calculated by taking the difference in the value of the fund at the start and the end of the holding period. The difference is then divided by the original investment value:

$$R_p = [(D + V_e) - V_s]/V_s$$

where:

R_p = the holding period return
D = any returns paid out from the investment or portfolio at the end of the period
V_s = the initial cost at the start of the period
V_e = the value of the investment at the end of of the period

The formula will need to be modified if dividends are paid out, as we will see in later sections.

By calculation of the percentage total return for any investment, it becomes possible to compare the relative performance of a variety of investments of different sizes and with different objectives and characteristics.

Example

Investment A costs £1,000 and at the end of six months returns £50, before being sold for £1,200. How can it be compared with investment B, bought at £500, held for one year and then sold for £800 with no income paid out?

Holding Period Return for Investment A:

Using this equation, the total return for Investment A can be calculated as follows:

$R_p = [(50 + 1,200) – 1,000] / 1,000 = 0.25$ or 25% in six months.

Holding Period Return for Investment B:

Using this equation, the total return for Investment B can be calculated as follows:

$R_p = [(0 + 800) – 500] / 500 = 0.6$ or 60% in one year.

The total returns of A and B are not yet directly comparable, since B was invested for twice as long as A. When A was sold, the proceeds could have been reinvested for another six months, but we do not know what return would have been available to the investor at that time.

To compare the returns, they must be for a standard period. This is achieved by using the equivalent period interest rate formula to annualise the returns, as follows:

Investment A: Rp = 25% in six months

Annualising this return: $R = (1 + 0.25)^2 – 1 = 0.5625$ or 56.25% pa.

Investment B: Rp = 60% pa.

As a result of converting both returns to a common base of an annual return, there is now a standardised measure of return, called the annualised total return. Notice also that, because of the compounding used in the formula, two successive six-month periods of 25% return generated an annualised return of 56.25%, which is not the same as just adding them together to get 50%.

So far so good, but this simple kind of measurement is not useful when there is a need to factor into the calculation significant cash inflows or outflows from the fund during the period. This can be demonstrated by considering another simple example.

Example

A fund has a value at inception of \$5 million (V_s = \$5m); pays out no dividends (D = 0); and halfway through the period, a further \$5 million is deposited, but the invested funds neither increase nor decrease in value. At the end of the period, it is worth \$10 million (V_e = \$10m). What is the fund's performance?

Using our equation above, we have:

R_p = [(0 + \$10m) – \$5m] / \$5m = 1 or 100%

This seems to be patently false since the fund has generated no return whatsoever. The terminal value of the fund is simply the sum of what was initially held, plus the funds added. There has been no growth or positive return generated.

This simple approach is, therefore, insufficient. In addition to the initial outlay or the value of the fund at inception, it is necessary to account for the deposits and withdrawals that occur during the period over which the performance is being measured. These shortcomings will be addressed in the money-weighted and time-weighted rates of return, which we will now consider.

7.2 Money-Weighted Rate of Return (MWRR)

Learning Objective

6.5.2 Be able to analyse performance to determine the money-weighted rate of return (MWRR)

The **money-weighted rate of return (MWRR)** is used to measure the performance of a portfolio or fund that has had deposits and withdrawals during the period being measured. It is also referred to as the internal rate of return (IRR).

The MWRR formula is the rate of return that solves the following:

$$MV_1 = (MV_0 \times (1+r)^m) + \sum (CF_i \times 1 + r^{Li})$$

where:

MV_1 = the portfolio value at the end of the period
MV_0 = the portfolio value at the start of the period
m = the number of days in the period
CF_i = cash flows
Li = number of days that the cash inflow is included in the portfolio or the number of days that a cash outflow is absent

The MWRR calculates the return on a portfolio as being equal to the sum of:

- the difference in the value of the portfolio at the start and the end of the period, plus
- any income or capital distributions made from the portfolio during that period.

The difference is then expressed as a percentage, to give the MWRR.

One of the main drawbacks of this method is that it cannot be solved algebraically. Rather, calculating the return is an iterative process – it must be found through trial and error, or interpolation. This is because it is necessary to use a discount factor in a DCF tabular calculation, which causes the NPV of all the cash flows to be equal to zero. The discount rate that is applied is the MWRR.

As a result, the MWRR calculation is a more time-consuming calculation than other methods, so it is unlikely you will see a problem in the exam that requires this method to be used. Instead, we need to consider a simpler way to calculate this, which is shown below.

In simple terms, the MWRR approximately equals:

$$\frac{\text{Value at the end of the period} - \text{Value at the beginning of the period} - \text{Net cash outflows}}{\text{Value at the start of the period} + \Sigma\text{Cash flows adjusted for the number of months}}$$

The formula is therefore:

$$\text{MWRR} = \frac{(V_1 - V_0) - C_f}{V_0 + \left(C_f \times \frac{n}{12}\right)}$$

where:

V_0 = the value at the start of the period
V_1 = the value at the end of the period
C_f = the net cash outflows
n = the number of months remaining in the period

If cash is added to the portfolio, it is a positive figure and will be subtracted from the returns in the numerator; if it is a withdrawal, it is a negative figure and has to be added back in to get the return. On the bottom line of the equation this logic is reversed, as the fund had use of any capital injected for the balance of the year and lost the use of withdrawals for the remainder of the year.

Example

Assume that a portfolio is worth £100,000 (V_0) at the beginning of the year and £110,000 (V_1) at the end of December of that year. The transactions that took place during the year were a cash injection of £5,000 at the end of March and a cash withdrawal of £7,000 at the end of September, to give a net cash outflow of £2,000.

The MWRR can be calculated as:

$$\text{MWRR} = \frac{(£110{,}000 - £100{,}000 + £2{,}000)}{\left[£100{,}000 + \left(£5{,}000 \times \frac{9}{12}\right) + \left(-£7{,}000 \times \frac{3}{12}\right)\right]} = 0.1176 \text{ or } 11.76\%$$

On the top line (ie, the numerator), £2,000 has been added as there was a net cash outflow, so the formula becomes –(–£2,000) which simplifies to +£2,000.

On the bottom line (ie, the denominator), the cash injection is included for the nine months it was held and a proportion of the cash outflow of £7,000 is subtracted as it was lost for the final three months of the year.

7.3 Time-Weighted Rate of Return (TWRR)

Learning Objective

6.5.3 Be able to analyse performance to determine the time-weighted rate of return (TWRR)

From portfolio construction theory, it is generally accepted that a **time-weighted rate of return (TWRR)** is the most suitable for determining the returns achieved from an investment. This is because the TWRR removes the impact of cash flows on the rate of return calculation.

The TWRR is established by breaking the investment period into sub-periods. A sub-period is created whenever there is a movement of capital into or out of the fund. Immediately prior to this point, a portfolio valuation must be obtained to ensure that the rate of return is not distorted by the size and timing of the cash flow.

The TWRR is calculated by compounding the rate of return for each of these individual sub-periods, applying equal weight to each sub-period in the process. This is known as unitised fund performance.

The formula for time-weighted rate of return is:

$$\text{TWRR} = \{(1 + R_{SP1})(1 + R_{SP2})...(1 + R_{SPn})\} - 1$$

where SPn is the percentage return during the relevant sub-period.

This can be seen in the following example.

Example

A portfolio is valued at £1,000 at the beginning of October and grows in value to £1,100 by 15 October. It receives a cash inflow of £215 on 16 October, and on 31 October it is valued at £1,500.

Using TWRR, a percentage return is calculated for each separate period as follows:

$$\text{Sub-period 1:r} = \frac{(£1{,}100 - £1{,}000)}{£1{,}000} = 0.1 \text{ or } 10\%$$

$$\text{Sub-period 2:r} = \frac{£1{,}500 - (£1{,}100 + £215)}{£1{,}315} = \frac{£185}{£1{,}315} = 0.141 \text{ or } 14.1\%$$

The returns for each sub-period are then linked to produce the TWRR.

$$\text{TWRR} = [(1 + 0{,}10) \times (1 + 0{,}141)] - 1 = 1{,}2551 - 1 = 0{,}2551 \text{ or } 25{,}51\,\%$$

7.3.1 MWRR versus TWRR

The primary difference between these two calculation methods is that MWRR assumes the same rate of return is earned during each sub-period, whereas TWRR accounts for the number of days invested in each sub-period return when calculating returns.

	MWRR	TWRR
Advantages	MWRR is appropriate where the portfolio/fund manager has control over the timing and size of cash inflows and outflows. It only requires a valuation at the start and end of the period.	TWRR is unaffected by external cash flow activity, so correctly reflects the return that an investor receives if they invested at the start of the period. Most portfolio/fund managers have little control over the size and timings of cash flows, so using a rate of return that is not influenced by them is more appropriate.

	MWRR	TWRR
Disadvantages	It can be distorted by the size and timing of external cash flows. If a portfolio/fund manager has little or no control over cash flows, MWRR is not a suitable measure to evaluate portfolio performance.	Valuations are required on every day that an external cash flow occurs meaning that, in practice, daily valuations are required. Daily valuations are administratively more expensive and prone to errors.

In many cases, the differences between MWRR and TWRR will be relatively small, but wide variations can occur in certain circumstances. For example, the MWRR will change dramatically if a large cash flow is received or paid near the beginning instead of near the end of the measurement period. However, TWRR rectifies this by defining periods according to cash flows.

As a result, the TWRR is more widely used.

8. Benchmarking

Learning Objective

6.6.1 Be able to assess a range of mainstream and specialist indices in relation to: composition; weighting; yield; synthetic dividend (where applicable); smart beta

The performance of the financial markets is usually tracked and reflected in the performance of various stock market indices. These indices are composed of a selection of different asset classes including equities, bonds, commodities and property, or a combination of these. An index is constructed by selecting a group of securities based on specific criteria, and the composition is governed by a transparent set of rules.

Indices are used for multiple purposes: they serve as portfolios for passive investors, provide benchmarks for evaluating the performance of actively managed portfolios, and act as a reference point for determining the price of derivative instruments.

If an index is to be used as a benchmark, it is important to understand its construction and methodology.

8.1 Weighting Methods

There are three main calculation methods used in the construction of a market index – price-weighted, market value-weighted and equal-weighted.

Index Calculation	
Price Weighted	• Also called share-weighted. • The index is constructed on the assumption that an equal number of shares are held in each of the constituents. • However, as these equal holdings are weighted according to each constituent's share price, those with a high share price (relative to that of other constituents) have a greater influence on the index value. • The index is calculated by summing the total of each constituent's share price and comparing the total to that of the base period. • The most famous price-weighted equity index is the Dow Jones Industrial Average (DJIA). For bonds, the application of price-weighting is rare, as bond prices can vary significantly due to factors such as coupon payments, interest rates and duration.
Market Capitalisation-Weighted	• Also called market cap-weighted or market value-weighted. • In these indices, larger companies account for proportionately more of the index as they are weighted according to each company's market capitalisation. Therefore, a small shift in their share prices will heavily influence the value of the index. • Most of the world's major equity indices are market capitalisation-weighted indices (eg, the FTSE 100, S&P 500 and Hang Seng Index). The Bloomberg Aggregate Bond Index series follows a similar approach, but for bonds, these types of indices are typically referred to as 'market value-weighted'.
Equal-Weighted	• Also called unweighted. • The index assumes that equal amounts are invested in each share in the index. • This can be useful when the largest companies comprise a disproportionately large weighting in the index and, therefore, an index constructed on a market capitalisation basis can give an misleading impression. • The MSCI USA Equal Weighted Index and Bloomberg US Aggregate Bond Float-Adjusted Index are examples of an equal-weighted equity and bond indices respectively.
Float-adjusted	• Only the freely tradable portion of shares are taken into consideration (ie, the free float). • Two examples are the MSCI World Float-Adjusted Index and Bloomberg Global Aggregate Bond Float-Adjusted Index.

Further, some indices are capped. A capped index is one which sets a limit on the weighting to any particular stock or sector – eg, MSCI FM15% Country Capped Index limits the exposure to any single frontiers market to 15% of the index at each quarterly rebalance.

8.2 Composition

An index typically tracks the performance of its constituents by converting their values into a single number. For example, in a market capitalisation-weighted index, the value is calculated by multiplying the number of outstanding shares by their price. However, this value is normally adjusted to include only shares that are freely tradable – a process known as the free float adjustment. The total market capitalisation of the listed shares is then converted into the index number you see quoted. This adjustment is necessary, as using the total market capitalisation could result in an unwieldy number – for example, the S&P 500 float-adjusted market value is a figure in the trillions of dollars.

When an index is first created, an arbitrary value (eg, 1,000) is assigned as the initial value. On that date, a divisor is calculated as the sum of the market capitalisations of the index constituents divided by the initial index value. The divisor is subsequently adjusted for any capital changes in the index constituents – for example, when a stock is added to or removed from the index, the divisor is recalculated to ensure that the index level does not jump. Adjustments are also made to account for corporate actions. These adjustments ensure that the index values remain consistent over time, and accurately reflect the performance of a portfolio with weights aligned to the index.

Due to the nature of the bond market, index construction differs somewhat from that seen for equity indices. Understanding the methodology used behind a bond index is essential if it is to be used as a portfolio benchmark. Some of the important areas to identify are:

- The investment universe included in the index and the eligibility criteria used to determine whether a bond is included.
- How frequently the indices are rebalanced and how the relative weights of index-eligible securities are determined.
- How prices are sourced and validated, and how securities are measured from both a return (pricing, coupon and principal payments) and a risk (duration, convexity and spread) perspective.
- How index returns are calculated and the relative weights of index-eligible securities are determined.

8.2.1 Eligibility Criteria

The eligibility criteria used in index construction should be clearly defined and objective to help index providers decide which securities to include and allow investors to predict which issues are eligible for a particular index.

The relevance of some of the eligibility criteria used includes:

- **Currency** – the currency used for the denomination of a bond and its coupon payments, so that investors can choose to assess the foreign currency risk associated with the return.
- **Country, market and sector** – the risk of the country of the issuing company, as well as the market in which the bond is marketed – whether to domestic investors only, non-local investors or offered globally across multiple markets. The sector classifications of bonds include government, corporate or securitised, with further sub-classifications for government-related issuers (sovereign governments, supranationals, local authorities or agencies).
- **Credit rating and subordination** – the credit rating of the bond as measured by ratings agencies, and whether it is investment grade or high yield (see chapter 4, section 6.1.6). Other considerations

include the security of a bond and where it stands in the capital structure of the issuer relative to other bonds that may have senior claims or subordinated claims in a credit event.
- **Time to maturity** – the minimum time permitted to maturity of the bond for inclusion in the index.
- **Amount outstanding** – the larger the bond issue, the more widely held it is, and therefore it is considered more liquid.

8.2.2 Rebalancing

Rebalancing schedules and methodologies differ for bond indices and equity indices, mainly due to the frequency of changes in their respective markets.

Rebalancing for equity indices tends to occur less frequently than for bond indices, typically on a quarterly or semi-annual basis, depending on the index's methodology. Changes in the composition of equity indices are driven by factors such as share price movements, market capitalisation shifts and liquidity changes. In contrast, many bond indices are rebalanced monthly to reflect the more frequent issuance and maturity of bonds; this allows bond indices to stay current with the latest securities and market conditions.

Index providers will announce an annual schedule of fixing dates at which constituents of the equity or bond index are determined, to enable return calculations to be undertaken. On each index fixing date, publicly available securities information is used to assess index eligibility and establish indicative values for the following month's index profile. This process provides those tracking these indices with advance notice of changes to the index composition, providing sufficient clarity and time for portfolio rebalancing.

8.3 Yield

A yield-based index measures the performance of a portfolio based on its yield, typically using dividend yields for equity indices or coupon yields for bond indices. This metric reflects how much income an investor could expect to receive from the assets in the index.

Yield indices can be used to track the income return (as opposed to the total return) of the underlying securities, and they can help to assess an index's income-generating potential. This type of benchmark is often used by investors looking for income-oriented investments, such as retirees or those seeking low-risk assets.

8.3.1 Synthetic Dividend Index

A synthetic dividend is an investment strategy whereby investors use various financial instruments to create an income stream from a non-dividend paying stock or portfolio. A common example involves selling (writing) covered call options on the underlying investments where the options premiums received by the writer help to enhance returns.

A synthetic dividend index applies a decrement strategy to the total return version of an underlying equity index (which is why it is also known as a decrement index). In this setup, dividends are deducted from the total return index, similar to how the price version of an index works. These deductions can

be either a fixed percentage (based on historical dividend yields, which tend to be stable over the long term) or a fixed amount, reflecting the expected income stream over time.

However, unlike a total return index, dividends for a synthetic dividend index are predefined. Further, dividends on a synthetic dividend index are usually paid on a daily basis (rather than quarterly or annually, as with a total return index). Thus, the daily decrement applied to the index causes the performance of the synthetic dividend index to diverge from that of the total return index over time.

An example of a synthetic dividend index is the CAC 40 Synthetic Dividend Index which, as its name suggests, is based on the CAC 40 index of French blue-chip companies. The index is calculated by adding together the cumulative values of the 40 Price index (which tracks the price performance of the 40 stocks) and the CAC 40 Cumulative Index (which measures the cumulative value of gross dividends; it is the same as the CAC 40 Dividend Index, but it is not reset to zero every year). From this sum, the CAC 40 Funding Index (which measures accrued interest based on recalibrated €STR plus a spread) is subtracted, thus completing the decrement.

Since the global financial crisis, synthetic dividend strategies have gained popularity, particularly in a persistently low interest rate environment, as investors sought alternative ways to generate an income beyond traditional dividend-paying stocks. As interest rates have started to rise in recent years, these strategies may continue to offer value for investors seeking income in a changing market landscape.

8.3.2 Smart Beta

As discussed in chapter 1, section 2.4.2, smart beta aims to combine the benefits of both active and passive strategies. It involves creating a custom benchmark consisting of stocks that exhibit certain behaviours (eg, low volatility, value, momentum), which is the active part of the strategy. This benchmark then serves as the passive strategy as a fund/portfolio tracks its performance.

8.4 Composite (Synthetic) Benchmark

Learning Objective

6.6.2 Know the characteristics of composite (synthetic) benchmark

Composite benchmarks are also sometimes referred to as synthetic benchmarks, as they are constructed or engineered to align with the specific characteristics and investment objectives of a portfolio. They are particularly useful when a portfolio spans multiple asset classes (eg, equities, bonds, commodities and property). By selecting relevant indices for each asset class and applying appropriate weightings, a composite benchmark provides a more tailored and accurate measure of performance than traditional single-market or style indices, and therefore provides a more meaningful performance comparison.

Custom-based benchmarks are a specific type of composite benchmark. These benchmarks are tailored to reflect the investment manager's approach, typically by selecting a combination of securities that best align with the portfolio's strategy. Custom benchmarks are often developed for funds with unique investment objectives or constraints. When a portfolio spans multiple asset classes, then a composite

index may need to be constructed, by selecting several relevant indices for each asset class, and applying appropriate weightings to calculate a composite re-turn.

An example of this approach is the MSCI PIMFA Private Investor Index Series, which consists of five indices, each with different asset allocations, and composed of related indices that reflect the differing objectives of investors.

8.4.1 Other Types of Benchmark

There are several other types of benchmarks in use, with the primary types outlined below:

- **Absolute benchmarks** – these benchmarks aim to exceed a minimum target return. For example, some absolute return funds aim to deliver positive returns over a rolling one-, two- or three-year period, typically with a specified margin over a benchmark rate (eg, SONIA or €STR).
- **Manager universes** – these benchmarks are based on peer group averages to determine the benchmark, by using the performance of the median manager as the benchmark. Since it cannot be specified in advance, this method and has been criticised for creating a herd mentality, focusing more on replicating peers rather than the specific needs of the portfolio.
- **Broad market indices** – examples include indices such as the MSCI World Index, S&P 500 and FTSE All-Share. They are well-recognised, easy to understand and readily measurable. Their drawback is that a manager's investment style may differ significantly from the index.
- **Style indices** – these indices group securities based on common characteristics, such as large-cap stocks or small-cap stocks. They represent a specific segment of an asset category, and can be used to benchmark a manager with a similar style.
- **Factor models** – a factor-based benchmark relates to one or more systematic sources of returns (factors or exposures) to the benchmark's performance. These factors could include market performance, sector or company size. While they provide insight into how performance is achieved, they can be difficult to understand, not specified in advance, and often expensive to use.
- **Returns-based benchmarks** – these benchmarks compare a manager's return to the returns of several style indices that best explain the manager's performance. They are generally easy to use and measurable but the mix of underlying styles may not always reflect the manager's investment process.

8.5 Global Investment Performance Standards (GIPS)

Learning Objective

6.6.3 Know key aspects of the Global Investment Performance Standards (GIPS)

Global Investment Performance Standards (GIPS) are not a way of benchmarking performance, but are global standards for calculating and presenting performance figures. As such, they represent a great leap forward for the performance measurement industry.

Originally established in 1999 by the Chartered Financial Analyst (CFA) Institute, GIPS were significantly enhanced in 2005 and again in 2020, with the aim of improving the standards and ensuring that they

reflect best practices. GIPS have been voluntarily adopted by industry representative organisations in over 40 countries to promote transparency and consistency in investment performance reporting.

Key features of the GIPS include the following:

- **Ethical standards** – GIPS are ethical standards for the presentation of investment performance ensuring fair representation and full disclosure of performance results.
- **Compliance requirements** – in order to claim compliance, firms must adhere to the guidelines in the GIPS standards. Compliance requires strict adherence to the prescribed methodologies and disclosure requirements.
- **Best practice** – firms are expected to follow the GIPS recommendations to achieve best practice in performance calculation and presentation.
- **Inclusion of all portfolios** – firms must include all actual, discretionary, fee-paying portfolios in at least one composite, defined by investment mandate, objective or strategy. This prevents firms from cherry-picking their best performance for presentation.
- **Methodologies and disclosure** – the GIPS standards require firms to follow specific calculation methodologies and disclose certain information along side performance results to ensure data accuracy and transparency.

GIPS require the use of a time-weighted rate of return (TWRR) to calculate investment returns. This method is used to eliminate the impact of cash flows (eg, deposits or withdrawals) on the performance calculation, providing a more accurate reflection of portfolio performance. For further details on TWRR, see section 7.3 of this chapter.

8.6 Performance Evaluation

Learning Objective

6.6.4 Be able to calculate the deviations from a performance benchmark attributable to: actual versus relative performance; asset allocation; stock selection

Calculating the performance of a portfolio/fund and its benchmark is an essential first step, but it is not enough to simply know the numbers. To truly assess a portfolio/fund's success, it needs to be evaluated what those numbers mean in the context of the investment strategy.

This process involves not just looking at returns in isolation, but understanding why those returns were achieved. By breaking down the portfolio's performance and comparing it to a relevant benchmark, the factors that contributed to or detracted from performance can be identified.

Performance evaluation aims to explain why a portfolio/fund achieved a certain return, by attributing the results to the decisions made by the portfolio/fund manager, such as asset allocation, sector choice and security selection.

This evaluation involves three key elements:

- **Performance measurement** – calculating the fund's performance based on changes in its value over specified time periods.

- **Performance attribution** – assessing how the manager attained that performance by identifying the sources of the portfolio/fund's returns.
- **Performance appraisal** – evaluating whether the performance is due to investment decisions, market movements or chance.

8.6.1 Performance Measurement

Performance measurement quantifies the return on investment, providing a baseline for analysis. The rate of return on a portfolio is the percentage change in the value of the portfolio over the period being considered. To calculate this accurately, it is important to first define what constitutes the portfolio's return, and then determine how it can be calculated in a way that accounts for the distorting effect of external cash flows into and out of the portfolio.

8.6.2 Performance Attribution

Performance attribution explains why a portfolio/fund's performance differs from the benchmark. It offers insights into the specific drivers of portfolio returns, helping investors, trustees and plan sponsors to understand which strategies or market factors contributed to or detracted from performance.

By assessing the returns achieved by a portfolio/fund manager, stakeholders can identify the key elements of the investment strategy that were responsible for the results, and gain a clearer understanding of why those outcomes were achieved.

For portfolio/fund managers, performance attribution can help to assess the effectiveness of their investment decisions, refine their strategies, and identify areas for improvement – ultimately, this can guide future portfolio management decisions and enhance overall performance.

The difference between the portfolio/fund return and the benchmark return is known as the active return. This active return is attributed to:

- asset allocation
- sector choice
- security selection.

To illustrate how performance attribution works, let's consider an example.

Example

An investment portfolio we are analysing had a value of £10 million at the start of the review period and was valued at £10.5 million at the end. There were no cash inflows or outflows during the period.

The benchmark used for the portfolio assumed an asset allocation of 50% in equities and 50% in bonds. Over the period, equities produced a negative return of 10% and gilts a positive return of 5%.

In contrast, the asset allocation of the fund was 80% in bonds and 20% in equities.

Step 1: Determine the Performance of the Portfolio and its Benchmark

First, we calculate the absolute performance of the portfolio and its benchmark, using the holding period return (HPR) formula in section 7.1 as there were no cash flows during the period. This calculation will determine whether the portfolio outperformed or underperformed the benchmark.

Portfolio:

HPR = (£10.5 million - £10 million) / £10 million = 0.05 or 5%

Benchmark:

The benchmark is split equally between equities and bonds. The table below shows how it has performed.

	Asset Allocation	Value at Start of the Period	Return	Value at End of Period
Equities	50%	£5 million	–10%	£4.5 million
Bonds	50%	£5 million	+5%	£5.25 million
Total		**£10 million**		**£9.75 million**

The weighted average return for the benchmark is:

R = (-10% x 0.5) + (5% x 0.5) = -2.5%

Step 2: Calculate the Performance Attributable to Asset Allocation

Next, we consider how asset allocation impacts returns. The portfolio's allocation differs from the benchmark, which will lead to either outperformance or underperformance.

Portfolio:

	Asset Allocation	Value at Start of the Period	Return	Value at End of Period
Equities	20%	£2 million	–10%	£1.8 million
Bonds	80%	£8 million	+5%	£8.4 million
Total		**£10 million**		**£10.2 million**

Benchmark:

From above, the benchmark's value at the end of the period is £9.75 million.

The fund has therefore outperformed the benchmark by £450,000 (ie, £10.2 million – £9.75 million).

Step 3: Performance Assessment
From this example, we observe the following:

- The fund has delivered a positive return of 2% (ie, (£10.2 million – £10 million) / £10 million), which exceeds the returns available from a purely passive approach: ie, of having a 50:50 allocation to the two benchmarks.
- The active approach taken by the portfolio manager – particularly their asset allocation decision – has allowed them to outperform the benchmark by 4.6% (ie, (£10.2 million - £9.75 million) / £9.75 million).

Step 4: Decompose Returns Further by Assessing the Impact of Stock Selection
To determine a manager's stock selection skill, we need to subtract the fund value resulting from asset allocation from the actual fund value at the end of the period. This will reveal how much of the fund's performance is attributable to decisions about individual securities, rather than asset allocation.

The portfolio's value at the end of the period is £10.5 million, while its value attributable to asset allocation is £10.2 million (as calculated in Step 2). The outperformance attributable to stock selection is therefore £300,000.

To break this down further, we need a detailed view of the portfolio's value at the end of the period. Let's assume that the equities are valued at £1.8 million and the bonds at £8.7 million; then the performance attributable to stock selection is as follows:

	Value at Start of the Period	End Value – Asset Allocation	Value at End of Period	Value Added
Equities	£2 million	£1.8 million	£1.8 million	£0
Bonds	£8 million	£8.4 million	£8.7 million	£300,000
Total	£10 million	£10.2 million	£10.5 million	£300,000

This being the case, stock selection within the bond segment has added £300,000 to the portfolio's performance. If the asset allocation were different, though (eg, a higher or lower proportion of bonds or equities), then the value added from stock selection would also change accordingly, as it depends on the relative performance of the individual securities within each asset class.

9. Risk Adjusted Returns

Learning Objective

6.7.1 Know what the following financial metrics are designed to measure: Sharpe ratio; Treynor ratio; Jensen measure; sterling ratio; calmar ratio; omega ratio

6.7.2 Be able to analyse performance using the Sharpe ratio

6.7.3 Be able to analyse performance using the Treynor ratio

6.7.4 Be able to analyse performance using the Jensen measure

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When evaluating the performance of an investment portfolio, calculating returns is an essential starting point. However, returns alone do not tell the full story – it is equally important to consider the level of risk taken to achieve those returns.

Example

Two portfolios both deliver a total return of 10% over the reporting period.

The first portfolio has invested heavily in volatile assets and using leverage; therefore, it has potentially taken on excessive risk, which exposes the investor to larger potential losses. On the other hand, the second portfolio achieved the same 10% return with much lower volatility and less risk exposure.

In this case, the second portfolio would generally be considered more attractive because it achieved the same return with lower risk.

Assessing risk-adjusted returns therefore allows investors to compare how effectively different portfolios have generated returns relative to the risks that they have taken. The following section explore various risk-adjusted performance metrics that help investors to assess whether a portfolio's returns justify the risk involved.

9.1 Sharpe Ratio

First proposed by Nobel Laureate William F. Sharpe, the Sharpe ratio provides an objective measure of the relative performance of two similarly undiversified portfolios. It measures the return in excess of the risk-free interest rate for each unit of risk taken on by the portfolio (with risk being measured by the standard deviation of the portfolio's returns).

The ratio is expressed as follows.

$$\text{Sharpe ratio} = \frac{(R_A - R_F)}{\sigma_A}$$

where:

R_A = the average return on the portfolio/fund
R_F = the risk-free rate
σ_A = the standard deviation of the portfolio returns.

Example

A portfolio has a return of 12%, a standard deviation of 10% and a risk-free rate of 2%. The Sharpe ratio would therefore be 1% (ie, (12% – 2%) / 10%). This means that for each unit of risk, the portfolio has delivered 1% of return over the risk-free rate.

The assumption behind the calculation, and the reason why the standard deviation is used as the denominator, is that investors prefer smoother returns to volatile or unpredictable ones; therefore, the higher the standard deviation, the lower the Sharpe ratio. A higher Sharpe ratio indicates better risk-adjusted performance, suggesting a higher level of active management skill. Further, positive Sharpe ratios are preferable to negative values. However, the Sharpe ratio does not account for the extra risk taken to achieve those higher returns.

9.2 Treynor Ratio

The Treynor ratio also measures the returns earned in excess of what could have been earned on a risk-free asset. It is sometimes called the 'reward-to-volatility ratio', as it relates the excess return over the risk-free rate to the additional risk taken as measured by the beta of the portfolio/fund. As the portfolio/fund's return would have been generated only by the systematic risk it had assumed, the Treynor ratio divides this return above the risk-free rate by its beta.

The ratio is expressed as follows.

$$\text{Treynor ratio} = \frac{(R_A - R_F)}{\beta_A}$$

where:

R_A = the average return on the portfolio/fund
R_F = the risk-free rate
β_A = the portfolio/fund's beta

Example (continued)

If the portfolio has the same return of 12% and a risk-free rate of 2%, but its beta is 1.5, then the Treynor ratio would be 6.67% (ie, (12% – 2%) / 1.5). This means that the portfolio has generated 6.67% of excess return per unit of systematic risk.

The Treynor ratio takes a similar approach to the Sharpe ratio but is calculated for a well-diversified portfolio. As with the Sharpe ratio, the Treynor ratio is used to compare performance of different portfolios/funds. Further, a higher Treynor ratio implies better risk-adjusted performance and greater implied active management skill.

9.3 Jensen Measure

The Jensen measure of risk-adjusted returns is used to evaluate the performance of a well-diversified portfolio/fund by comparing it to a capital asset pricing model (CAPM) benchmark, which assumes that the portfolio/fund takes on the same level of systematic risk as the benchmark. For more details on CAPM, see chapter 1, section 10.3.

Jensen measure is calculated as follows:

$$\text{Jensen measure} = R_A - [R_F + \beta_A \times (R_M - R_F)]$$

where:

R_A = the average return on the portfolio/fund
R_F = the risk-free rate
β_A = the portfolio/fund's beta
R_M = the average market return.

It can also be more simply expressed as:

$$\text{Jensen measure} = (\text{Return on the portfolio} - \text{Return predicted by CAPM})$$

The extent of any outperformance or underperformance is known as **Jensen's alpha**.

Example (continued)

To recap, the portfolio has generated a return of 12% and a beta of 1.5, and the risk-free rate is 2%. Suppose that the market return is 10%. Using CAPM, the expected return for the portfolio can be calculated as follows:

Expected return = 2% + 1.5 (10% - 2%) = 2% + (1.5 x 8%) = 14%

Since the portfolio's actual return is 12%, it has underperformed the expected return by 2% (ie, 12% – 14%). The Jensen measure (ie, alpha) for this portfolio is therefore -2%, indicating that the portfolio has underperformed its expected return based on the level of systematic risk it took on.

The Jensen measure establishes whether the portfolio/fund has performed in line with its CAPM benchmark, and it therefore lies on the security market line (SML); or whether it has outperformed or underperformed the benchmark, and is therefore positioned above or below below the SML respectively.

- A portfolio/fund that generates a positive alpha will plot above the SML.
- A portfolio/fund that generates a zero alpha will plot on the SML.
- A portfolio/fund that generates a negative alpha will plot below the SML.

9.4 Other Risk-Adjusted Measures

- The **information ratio** assesses the degree to which a portfolio manager uses skill and knowledge to enhance returns. It compares the excess return achieved by a portfolio over a benchmark to the portfolio's tracking error, which is calculated as the standard deviation of excess returns from the benchmark. The tracking error gives us an estimate of the risks that the manager takes in deviating from the benchmark.
- The **Sortino ratio** is a variant on the Sharpe ratio, focusing only on downside risk below a predefined threshold or minimum acceptable return. This reflects the idea that investors are primarily concerned with negative volatility rather than overall volatility. Unlike the Sharpe ratio, therefore, it does not penalise positive returns, as they are not generally viewed as a risk.
- The **Sterling ratio (SR)** is a risk-adjusted measure used to evaluated how efficiently risk capital is being allocated. It is often used by hedge funds, as well as individual investors.
- The **Calmar ratio** measures the performance of a portfolio/fund, (particularly hedge funds) in relation to its risk. It compares return to risk, which is calculated by dividing the average annual rate of return by the maximum drawdown over the past three years. Hence, it is also called the drawdown ratio.
- The **Omega ratio** is a weighted risk-return ratio that measures the performance of an investment asset, portfolio, or strategy at a given level of expected return. Developed to overcome flaws of traditional performance measures, such as the Sharpe ratio, the Omega ratio considers all distributions and accounts for excess returns.

End of Chapter Questions

Think of an answer for each question and refer to the appropriate workbook section for confirmation.

1. **How does a sample differ from a population?**
   Answer reference: Section 1.2.1

2. **You have a choice of the following types of graph to display information: bar chart; pie chart; histogram; scatter diagram. Which would be most useful to understand the relationship between two variables?**
   Answer reference: Section 1.2.2

3. **An investment has provided the following monthly returns: 7%, -7%, 3%, 9% and -2%. Calculate its standard deviation.**
   Answer reference: Sections 2.3.3 and 2.3.4

4. **What is regression analysis, and what is it used for?**
   Answer reference: Section 4

5. **In technical analysis, what is a primary movement?**
   Answer reference: Section 6.2

6. **What is the relationship between breakouts from continuation patterns and relative strength charts?**
   Answer reference: Section 6.4

7. **A portfolio was worth £100,000 at the beginning of the year and £106,000 at the end of December of that year. The transactions that took place during the year were a cash injection of £2,000 at the end of March, and a cash withdrawal of £3,000 at the end of September. What was the money-weighted rate of return (MWRR)?**
   Answer reference: Section 7.2

8. **When constructing a multi-factor model, what are the four important factors that influence security returns?**
   Answer reference: Section 8.4.1

9. **How does performance evaluation help to explain a portfolio's returns in relation to the decisions made by a portfolio/fund manager?**
   Answer reference: Section 8.6.2

10. **What does the Sharpe ratio of a fund indicate?**
    Answer reference: Section 9.1

Glossary

Active Management

An investment approach employed to exploit pricing anomalies in those securities markets that are believed to be subject to mispricing by utilising fundamental analysis and/or technical analysis to assist in the forecasting of future events and the timing of purchases and sales of securities. Also known as *market timing*.

Active Risk

The risk that arises from holding securities in an actively managed portfolio in different proportions from their weighting in a benchmark index. Also known as *tracking error*.

AIM

The London Stock Exchange's (LSE) market for smaller UK public limited companies (plcs), formerly called the Alternative Investment Market. AIM has less demanding admission requirements and places less onerous continuing obligation requirements upon those companies admitted to the market than those applying for a full list on the LSE.

Alpha

The return from a security or a portfolio in excess of a risk-adjusted benchmark return.

Alternative Investments

Alternative investments are those which fall outside the traditional asset classes of equities, property, fixed interest, cash and money market instruments.

Amortisation

The depreciation charge applied in company accounts against capitalised intangible assets.

Annual General Meeting (AGM)

The annual meeting of directors and ordinary shareholders of a company. All companies are obliged to hold an AGM at which the shareholders receive the company's report and accounts and have the opportunity to vote on the appointment of the company's directors and auditors and the payment of a final dividend recommended by the directors or vote in other company resolutions raised by the Board or by shareholders.

Annuity

An investment that provides a series of prespecified periodic payments over a specific term or until the occurrence of a prespecified event (eg, death).

Arbitrage

The process of deriving a risk-free profit by simultaneously buying and selling the same asset in two related markets where a pricing anomaly exists.

Arithmetic Mean

A measure of central tendency established by summing the observed values in a data distribution and dividing this sum by the number of observations. The arithmetic mean takes account of every value in the distribution.

Articles of Association

The legal document which sets out the internal constitution of a UK company. Details of shareholder voting rights and company borrowing powers are included.

Asset Allocation

The process within investing that determines the selection of assets and the respective weightings and position of those assets in conjunction with each other. Asset allocation typically creates a model that will determine asset type, geographical focus and industry sectors invested.

Balance of Payments

A summary of all economic transactions between one country and the rest of the world, typically conducted over a calendar year.

Base Currency

The currency against which the value of another currency is expressed. The base currency for the X/Y exchange rate is currency X.

Basis

The difference between the futures price and the price of the underlying asset.

Bear Market

Conventionally defined as a 20% or more decline in a securities market. The length of the market move is immaterial. Bear markets also may lead, lag or coincide with general economic downturns such as a recession, or may be a response to periods of geopolitical concerns or uncertainty.

Bearer Securities

Those whose ownership is evidenced by the mere possession of a certificate. Ownership can, therefore, pass from hand to hand without any formalities.

Beneficiaries

The beneficial owners of trust property.

Beta

The covariance between the returns from a security and those of the market relative to the variance of returns from the market. It is a statistical measure that confers the market sensitivity of an asset.

Bonus Issue

The free issue of new ordinary shares to a company's ordinary shareholders, in proportion to their existing shareholdings through the conversion, or capitalisation, of the company's reserves. By proportionately reducing the market value of each existing share, a bonus issue makes the shares more marketable. Also known as a capitalisation issue or scrip issue.

Broker Dealer

A London Stock Exchange (LSE) member firm that can act in a dual capacity both as a broker acting on behalf of clients and as a dealer dealing in securities on their own account.

Bull Market

A rising securities market. The length of the market move is immaterial.

Call Option

An option that confers a right (but not an obligation) on the holder to buy a specified amount of an asset at a prespecified price on or sometimes before a prespecified date.

Central Bank

Those public institutions that operate at the heart of a nation's financial system. Central banks typically have responsibility for setting a nation's or a region's short-term interest rate, controlling the money supply, acting as banker and lender of last resort to the banking system and managing the national debt. They increasingly implement policies independently of government control. The Bank of England is the UK's central bank.

Clean Price

The quoted price of a bond. The clean price excludes accrued interest or interest to be deducted, as appropriate.

Combinations

A strategy requiring the simultaneous purchase or sale of both a call option and a put option on the same underlying asset, sometimes with different exercise prices but always with the same expiry dates. Combinations include straddles and strangles.

Commercial Paper (CP)

Unsecured bearer securities issued at a discount to par by public limited companies (plcs) with high credit ratings. Commercial paper is a money market instrument with maturities up to 270 days and does not pay coupons but is redeemed at par.

Consumer Duty

A UK regulatory framework introduced by the Financial Conduct Authority (FCA). It requires firms to act in the best interests of their customers, ensuring that products, services and advice deliver good outcomes. Firms must also ensure that their offerings are suitable, fair and transparent throughout the customer relationship.

Consumer Prices Index (CPI)

Geometrically weighted inflation index targeted by the Monetary Policy Committee, based on an evolving basket of goods and services identified to represent a typical household.

Convertible Bonds

Bonds issued with a right to convert into either another of the issuer's bonds or, if issued by a company, the company's equity, both on prespecified terms.

Convertible Loan Stock

Bonds issued with a right to convert into the issuing company's equity on prespecified terms.

Convertible Preference Shares

Preference shares issued with a right to convert into the issuing company's equity on prespecified terms.

Convexity

The non-symmetrical relationship that exists between a bond's price and its yield. The more convex the bond, the greater the price rise for a fall in its yield and the smaller the price fall for a rise in its yield. Convexity also confers the changing sensitivity of a bond to duration over time.

Corporate Governance

The mechanism that seeks to ensure that companies are run in the best long-term interests of their shareholders.

Correlation

The degree of co-movement between two variables determined through regression analysis and quantified by the correlation coefficient. Correlation does not prove that a cause-and effect or, indeed, a steady relationship exists between two variables, as correlations can arise from pure chance.

Coupon

The predetermined rate of interest applied to a bond over its term, expressed as a percentage of the bond's nominal value. The coupon is usually a fixed rate of interest.

Covariance

The correlation coefficient between two variables multiplied by their individual standard deviations. Covariance is statistically related to correlation.

Debenture

A corporate bond issued in the domestic bond market and secured on the issuing company's assets by way of a fixed or a floating charge.

Depreciation

The charge applied in a company's accounts against its tangible fixed assets to reflect the usage of these assets over the accounting period.

Derivative

An instrument whose value is based on the price of an underlying asset. Derivatives can be based on both financial and commodity assets.

Dirty Price

The price of a bond inclusive of accrued interest or exclusive of interest to be deducted, as appropriate.

Discount

The difference in the spot and forward exchange rate that arises when interest rates in a currency are higher than those in the base currency.

Discount Rate

The rate of interest used to establish the present value of a sum of money receivable in the future.

Dividend

The distribution of a proportion of a company's distributable profit to its shareholders. Dividends are usually paid twice a year and are expressed in pence per share.

Dow Jones Industrial Average (DJIA)

A price-weighted arithmetic index of 30 actively traded US stocks.

Duration

The weighted average time, expressed in years, for the present value of a bond's cash flows to be received. Also known as Macaulay duration.

Economic Cycle

The course an economy conventionally takes as economic growth fluctuates over time. Also known as the business cycle.

Economic Growth

The growth of gross domestic product (GDP) or gross national product (GNP) expressed in real terms usually over the course of a calendar year. Often used as a barometer of an economy's health.

Economies of Scale

The resulting reduction in a firm's unit costs as the firm's productive capacity and output increases. Economies of scale are maximised and unit costs minimised at the minimum efficient scale (MES) on a firm's long-term average total cost (LTATC) curve. Beyond this point, diseconomies of scale set in.

Efficient Frontier

A convex curve used in modern portfolio theory that represents those efficient portfolios that offer the maximum expected return for any given level of risk.

Efficient Markets Hypothesis (EMH)

The proposition that everything that is publicly known about a particular stock or market should be instantaneously reflected in its price. As a result of active portfolio managers and other investment professionals exhaustively researching those securities traded in developed markets, the EMH argues that share prices move randomly and independently of past trends, in response to fresh information, which itself is released at random.

Equity

That which confers a direct stake in a company's fortunes. Also known as a company's ordinary share capital.

Eurobond

International bond issues denominated in a currency different from that of the financial centre(s) in which they are issued. Most eurobonds are issued in bearer form through bank syndicates.

Euronext

The Paris, Amsterdam, Brussels and Lisbon stock and derivatives exchange which is now part of NYSE Euronext.

European Central Securities Depository Association (ECSDA)

The official association of the Central Securities Depositary in Europe. The ECSDA aims to promote a constructive dialogue between the CDS community, European and global public authorities, among other stakeholders, in order to contribute to an efficient and risk-averse infrastructure for financial markets.

Exchange Rate

The price of one currency in terms of another.

Ex-dividend (xd)

The period during which the purchase of shares or bonds (on which a dividend or coupon payment has been declared) does not entitle the new holder to the next dividend or interest payment.

Exercise Price

The price at which the right conferred by an option can be exercised by the holder against the writer.

Ex-rights (xr)

The period during which the purchase of a company's shares does not entitle the new shareholder to participate in a rights issue announced by the issuing company. Shares are usually traded ex-rights (xr) on or within a few days of the company making a rights issue announcement.

Fair Value

The theoretical price of a futures contract.

Financial Gearing

The ratio of debt to equity employed by a company within its capital structure.

Financial Conduct Authority (FCA)

One of the two principal regulators of the financial services industry in the UK responsible for: regulating conduct in retail and wholesale markets; supervising the trading infrastructure that supports those markets; and for the prudential regulation of firms not prudentially regulated by the Prudential Regulation Authority (PRA).

Fiscal Policy

The use of government spending, taxation and borrowing policies to either boost or restrain domestic demand in the economy so as to maintain full employment and price stability.

Fixed-Interest Security

A tradeable negotiable instrument, issued by a borrower for a fixed term, during which a regular and predetermined fixed rate of interest based upon a nominal value is paid to the holder until it is redeemed and the principal is repaid.

Flat Yield

The return from a bond calculated by expressing the coupon as a percentage of the clean price. Also known as the running yield or interest yield.

Flight to Quality

The movement of capital to a safe haven during periods of market turmoil to avoid capital loss.

Floating Rate Notes (FRNs)

Debt securities issued with a coupon periodically referenced to a benchmark interest rate.

Forward

A derivatives contract that creates a legally binding obligation between two parties for one to buy and the other to sell a prespecified amount of an asset at a prespecified price on a prespecified future date. As individually negotiated contracts, forwards are not traded on a derivatives exchange.

Forward Exchange Rate

An exchange rate set today, embodied in a forward contract, that will apply to a foreign exchange transaction at some prespecified point in the future.

Forward Rate

The implied annual compound rate of interest that links one spot rate to another assuming no interest payments are made over the investment period.

Frequency Distribution

Data either presented in tabulated form or diagrammatically, whether in ascending or descending order, where the observed frequency of occurrence is assigned to either individual values or groups of values within the distribution.

Fund of Funds

A fund of funds is a multi-manager fund. It has one overall manager that invests in a portfolio of other existing investment funds and seeks to harness the best investment manager talent available within a diversified portfolio.

Fundamental Analysis

The calculation and interpretation of yields, ratios and discounted cash flows (DCFs) that seek to establish the intrinsic value of a security or the correct valuation of the broader market. The use of fundamental analysis is nullified by the semi-strong form of the efficient markets hypothesis (EMH).

Future

A derivatives contract that creates a legally binding obligation between two parties for one to buy and the other to sell a prespecified amount of an asset at a prespecified price on a prespecified future date. Futures contracts differ from forward contracts in that their contract specification is standardised so that they may be traded on a derivatives exchange.

Geometric Mean

A measure of central tendency established by taking the n^{th} root of the product (multiplication) of n values.

Gilts

UK government securities issued primarily to finance government borrowing.

Gross Domestic Product (GDP)

A measure of the level of activity within an economy. More precisely, GDP is the total market value of all final goods and services produced domestically in an economy typically during a calendar year.

Gross National Product (GNP)

Gross domestic product (GDP) at market prices plus net property income generated from overseas economies by UK factors of production.

Gross Redemption Yield (GRY)

The annual compound return from holding a bond to maturity taking into account both interest payments and any capital gain or loss at maturity. Also known as the yield to maturity (YTM).

Hedging

A technique employed to reduce the impact of adverse price movements in financial assets held.

Immunisation

Passive bond management techniques that comprise cash matching and duration-based immunisation.

Index

A single number that summarises the collective movement of certain variables at a point in time in relation to their average value on a base date or a single variable in relation to its base date value.

Index-Linked Gilts

UK government bonds (gilts) whose principal and interest payments are linked to the retail prices index (RPI). Those issued before September 2005 are subject to an eight-month time lag, and those issued after to a three-month lag.

Inflation

The rate of change in the general price level or the erosion in the purchasing power of money.

Initial Margin

The collateral deposited by exchange clearing members with the clearing house when opening certain derivatives transactions.

Internal Rate of Return (IRR)

The discount rate that when applied to a series of cash flows produces a net present value (NPV) of zero. Also known as the Discounted Cash Flow (DCF) Yield.

Interpolation

A method by which to establish an approximate Internal Rate of Return (IRR).

Investor

An individual or institution that allocates capital to assets, with the goal of generating long-term returns. They typically hold positions for months, years or even decades. In contrast, traders seek to profit from short-term market movements.

Irredeemable Security

A security, bond or share issued without a prespecified date of redemption or maturity.

Issuing House

An institution that facilitates the issue of securities.

Jensen's Alpha

A risk-adjusted performance measure that is employed to evaluate the performance of a well-diversified portfolio against a CAPM benchmark with the same level of systematic risk as that assumed by the portfolio.

Liquidity

The ease with which a security can be converted into cash, is often referred to as how easy it is to deal in and out of a security based on volume and a narrow spread. Liquidity also describes that amount of an investor's financial resources held in cash.

Listing

Public limited companies (plcs) admitted to a stock exchange's official list.

Loan Stock

A corporate bond issued in the domestic bond market without any underlying collateral, or security.

London Clearing House (LCH)

The institution that clears and acts as central counterparty to all trades executed on member exchanges.

London Stock Exchange (LSE)

The UK market for listing and trading domestic and international securities.

Long-term Asset Fund (LTAF)

A UK-regulated open-ended fund introduced by the FCA in 2021 to provide investors with access to illiquid, long-term assets, while requiring extended notice periods for redemptions to address liquidity mismatches.

Long Position

The position following the purchase of a security or buying of a derivative.

Macroeconomics

The study of how the aggregation of decisions taken in individual markets determines variables such as national income, employment and inflation. Macroeconomics is also concerned with explaining the relationship between these variables, their rates of change over time and the impact of monetary policy and fiscal policy on the general level of economic activity.

Manager of Managers (MoM) Fund

A multi-manager fund. It does not invest in other existing retail collective investment schemes. Instead it entails the MoM fund arranging segregated mandates with individually chosen fund managers.

Marginal Cost (MC)

The change in a firm's total cost resulting from producing one additional unit of output.

Marginal Revenue (MR)

The change in the total revenue generated by a firm from the sale of one additional unit of output.

Markets in Financial Instruments Directive (MiFID)

MiFID came into effect on 1 November 2007. It replaced the Investment Services Directive (ISD) and covers the regulation of certain financial services for the member states of the European Economic Area (EEA).

Market Capitalisation

The total market value of a company's shares or other securities in issue. Market capitalisation is calculated by multiplying the number of shares or other securities a company has in issue by the market price of those shares or securities.

Marking to Market

The process of valuing/revaluing a position taken in a securities or a derivatives market.

Mean Variance Analysis

The use of past investment returns to predict the investment's most likely future return and to quantify the risk attached to this expected return. Mean variance analysis underpins modern portfolio theory (MPT).

Median

A measure of central tendency established by the middle value within an ordered distribution containing an odd number of observed values or the arithmetic mean of the middle two values in an ordered distribution containing an even number of values.

Minimum Efficient Scale (MES)

The level of production at which a firm's long-run average production costs are minimised and its economies of scale are maximised.

Mode

A measure of central tendency established by the value or values that occur most frequently within a data distribution.

Modern Portfolio Theory (MPT)

The proposition that investors will only choose to hold those diversified, or efficient, portfolios that lie on the efficient frontier.

Modified Duration (MD)

A measure of the sensitivity of a bond's price to changes in its yield.

Monetary Policy

The setting of short-term interest rates by a central bank in order to manage domestic demand and achieve price stability in the economy.

Money

Anything that is generally acceptable as a means of settling a debt.

Money-Weighted Rate of Return (MWRR)

The internal rate of return (IRR) that equates the value of a portfolio at the start of an investment period plus the net new capital invested during the investment period with the value of the portfolio at the end of this period.

Multi-Manager Funds

A fund that offers a portfolio of separately managed funds. There are two main types: fund of funds (FoFs) and manager of managers (MoMs).

Multiplier

The factor by which national income changes as a result of a unit change in aggregate demand (ie, the total demand for goods and services within an economy).

National Association of Securities Dealers Automated Quotations (Nasdaq)

The second-largest stock exchange in the US. NASDAQ lists certain US and international stocks and provides a screen-based quote-driven secondary market that links buyers and sellers worldwide.

National Debt

A government's total outstanding borrowing resulting from financing successive budget deficits, mainly through the issue of government-backed securities.

Negotiable Security

A security whose ownership can pass freely from one party to another. Negotiable securities are, therefore, tradeable.

Net Present Value (NPV)

The result of subtracting the discounted, or present, value of a project's expected cash outflows from the present value of its expected cash inflows.

New Issue

A new issue of ordinary shares whether made by an offer for sale, an offer for subscription or a placing. Also known as an initial public offering (IPO).

Nominal Value (NV)

The face or par value of a security. It is the price at which a bond is issued and usually redeemed and the price below which a company's ordinary shares cannot be issued.

Normal Profit

The required rate of return for a firm to remain in business taking account of all opportunity costs.

Option

A derivatives contract that confers the right from one party (the writer) to another (the holder) to either buy (call option) or sell (put option) an asset at a prespecified price on, and sometimes before, a prespecified future date, in exchange for the payment of a premium.

Over-the-Counter (OTC)

Instruments that are not traded on a derivatives exchange.

Pari Passu

Of equal ranking. New ordinary shares issued under a rights issue, for instance, rank pari passu with the company's existing ordinary shares.

Passive Management

An investment approach employed in those securities markets that are believed to be price-efficient.

Permanent Interest-Bearing Securities (PIBS)

Irredeemable fixed interest securities issued by mutual building societies. Known as perpetual subordinated bonds (PSBs) if the building society demutualises.

Perpetuity

An investment that provides an indefinite stream of equal prespecified periodic payments.

PLUS Markets

A stock exchange competitor to the London Stock Exchange (LSE).

Population

A statistical term applied to a particular group where every member or constituent of the group is included.

Pre-emption Rights

The rights accorded to ordinary shareholders under company law to subscribe for new ordinary shares issued by the company, in which they have the shareholding, for cash before the shares are offered to outside investors.

Preference Shares

Those shares issued by a company that rank ahead of ordinary shares for the payment of dividends and for capital repayment in the event of the company going into liquidation.

Premium

The amount of cash paid by the holder of an option to the writer in exchange for conferring a right. Also, the difference in the spot and forward exchange rate that arises when interest rates in the base currency are higher than those in another currency.

Present Value (PV)

The value of a sum of money receivable at a known future date expressed in terms of its value today. A present value is obtained by discounting the future sum by a known rate of interest.

Primary Data

Data commissioned for a specific purpose.

Primary Market

The market for new issues or initial public offerings (IPOs).

Prudential Regulation Authority (PRA)

One of the two principal regulators of the financial services industry in the UK, responsible for prudential regulation of all deposit-taking institutions, insurers and investment banks. The PRA is part of the Bank of England.

Put Option

An option that confers a right (but not an obligation) on the holder to sell a specified amount of an asset at a prespecified price on or sometimes before a prespecified date.

Redemption

The repayment of principal to the holder of a redeemable security.

Regression Analysis

A statistical technique used to establish the degree of correlation that exists between two variables.

Reinvestment Risk

The inability to reinvest coupons at the same rate of interest as the gross redemption yield (GRY). This in turn makes the GRY conceptually flawed.

Repo

The sale and repurchase of bonds between two parties: the repurchase being made at a price and date fixed in advance. Repos are categorised into general repos and specific repos.

Resistance Level

A term used in technical analysis to describe the ceiling put on the price of a security resulting from persistent investor selling at that price level.

Retail Price Index (RPI)

An expenditure-weighted measure of UK inflation based on a representative basket of goods and services purchased by an average UK household.

Rights Issue

The issue of new ordinary shares to a company's shareholders in proportion to each shareholder's existing shareholding, usually at a price deeply discounted to that prevailing in the market.

Sample

A statistical term applied to a representative subset of a particular population. Samples enable inferences to be made about the population.

Secondary Data

Pre-existing data.

Secondary Market

The market for trading securities already in issue.

Securitisation

The packaging of rights to the future revenue stream from a collection of assets into a bond issue.

Separate Trading of Registered Interest and Principal Securities (STRIPS)

The principal and interest payments of those designated gilts that can be separately traded as zero coupon bonds (ZCBs).

Share Buyback

The redemption and cancellation by a company of a proportion of its irredeemable ordinary shares subject to the permission of the High Court and agreement from HMRC.

Share Capital

The nominal value of a company's equity or ordinary shares. A company's authorised share capital is the nominal value of equity the company may issue while issued share capital is that which the company has issued. The term 'share capital' is often extended to include a company's preference shares.

Share Split

A method by which a company can reduce the market price of its shares to make them more marketable without capitalising its reserves. A share split simply entails the company reducing the nominal value of each of its shares in issue while maintaining the overall nominal value of its share capital.

Short Position

The position following the sale of a security not owned or selling a derivative.

Special Purpose Vehicle (SPV)

A legal entity created by a parent company to fulfil narrow, specific or temporary objective, in order to isolate the parent company from financial risk. Also called a special purpose entity (SPE).

Spot Rate

A compound annual fixed rate of interest that applies to an investment over a specific time period.

Spreads

A strategy requiring the simultaneous purchase of one or more options and the sale of another or several others on the same underlying asset with either different exercise prices and the same expiry date or the same exercise prices and different expiry dates.

Standard Deviation

A measure of dispersion. In relation to the values within a distribution, the standard deviation is the square root of the distribution's variance.

Stock Exchange

An organised marketplace for issuing and trading securities by members of that exchange.

Stock Exchange Automated Quotation (SEAQ)

The London Stock Exchange's (LSE) quote-driven screen-based trading system that displays firm bid and offer prices quoted by competing market makers during the mandatory quote period.

Stock Exchange Electronic Trading Service (SETS)

The London Stock Exchange's (LSE) screen-based order-driven trading system that electronically matches buy and sell orders input to the system. Only the most liquid securities in the UK equity market can be traded through SETS and all orders must be firm and not indicative, as, once displayed, an order must be capable of immediate execution.

Swap

An over-the-counter (OTC) derivative whereby two parties exchange a series of periodic payments based on a notional principal amount over an agreed term. Swaps can take the form of interest rate swaps, currency swaps and equity swaps.

T+2

The two-day rolling settlement period over which all equity deals executed on the London Stock Exchange (LSE)'s SETS are settled. This is also a standard settlement period for most international equity markets.

Technical Analysis

The analysis of charts depicting past price and volume movements to determine the future course of a particular market or the price of an individual security. Technical analysis is nullified by the weak form of the efficient markets hypothesis (EMH).

Tick

The minimum price movement of an instrument or a derivatives contract as specified by the exchange on which it is traded.

Tick Value

The monetary value of one tick.

Time Value

That element of an option premium that is not intrinsic value. Time value also relates to a sum of money which, by taking account of a prevailing rate of interest and the term over which the sum is to be invested or received, can be expressed as either a future value (FV) or as a present value (PV), respectively.

Time-Weighted Rate of Return (TWRR)

The unitised performance of a portfolio over an investment period that eliminates the distorting effect of cash flows. The TWRR is calculated by compounding the rates of return from each investment sub-period, a sub-period being created whenever there is a movement of capital into or out of the portfolio.

Tonne of CO2 Equivalent (tCO2e)

The amount of greenhouse gases that may be emitted during a given period, measured in metric tons of carbon dioxide (CO_2) equivalent. Emissions for a range of greenhouse gases are converted to the CO_2 equivalent, as some are more potent in their effect on climate change and/or persist longer in the atmosphere than others.

Trader

An individual or institution that buys and sells financial assets frequently, often within short time frames (ranging from seconds to months) to take advantage of market volatility and price fluctuations. In contrast, investors focus on long-term potential of an asset.

Treasury Bills (T-bills)

Short-term government-backed securities issued at a discount to par. They do not pay coupons but are redeemed at par.

Trustees

The legal owners of trust property who owe a duty of skill and care to the trust's beneficiaries.

UK Corporate Governance Code

The code that embodies best corporate governance practice for all public limited companies (plcs) quoted on the London Stock Exchange (LSE). Also known as the Code of Best Practice.

Undertakings for Collective Investment in Transferable Securities (UCITS) Directive

An EU directive originally introduced in 1985 but since revised to enable collective investment schemes (CISs) authorised in one EU member state to be freely marketed throughout the EU, subject to the marketing rules of the host state(s) and certain fund structure rules being complied with.

Unemployment

The percentage of the labour force registered as available to work at the current wage rate.

Variance

A measure of dispersion. In relation to the values within a distribution, the variance is the mean of the sum of the squared deviations from the distribution's arithmetic mean.

Variation Margin

The cash that passes between the exchange clearing members daily via the clearing house in settlement of the previous day's price movement in an open derivatives contract.

Volatility

A measure of the extent to which investment returns, asset prices and economic variables fluctuate. Volatility is measured by the standard deviation of these returns, prices and values.

Warrants

Negotiable securities issued by public limited companies (plcs) that confer a right on the holder to buy a certain number of the company's ordinary shares on prespecified terms. Warrants are essentially long-dated call options but are traded on a stock exchange rather than on a derivatives exchange.

Weighted Average Cost of Capital (WACC)

The average post-tax cost of servicing a company's long-term sources of finance. The WACC acts as the discount rate for establishing the net present value (NPV) of investment projects of equivalent risk to those currently undertaken by the company.

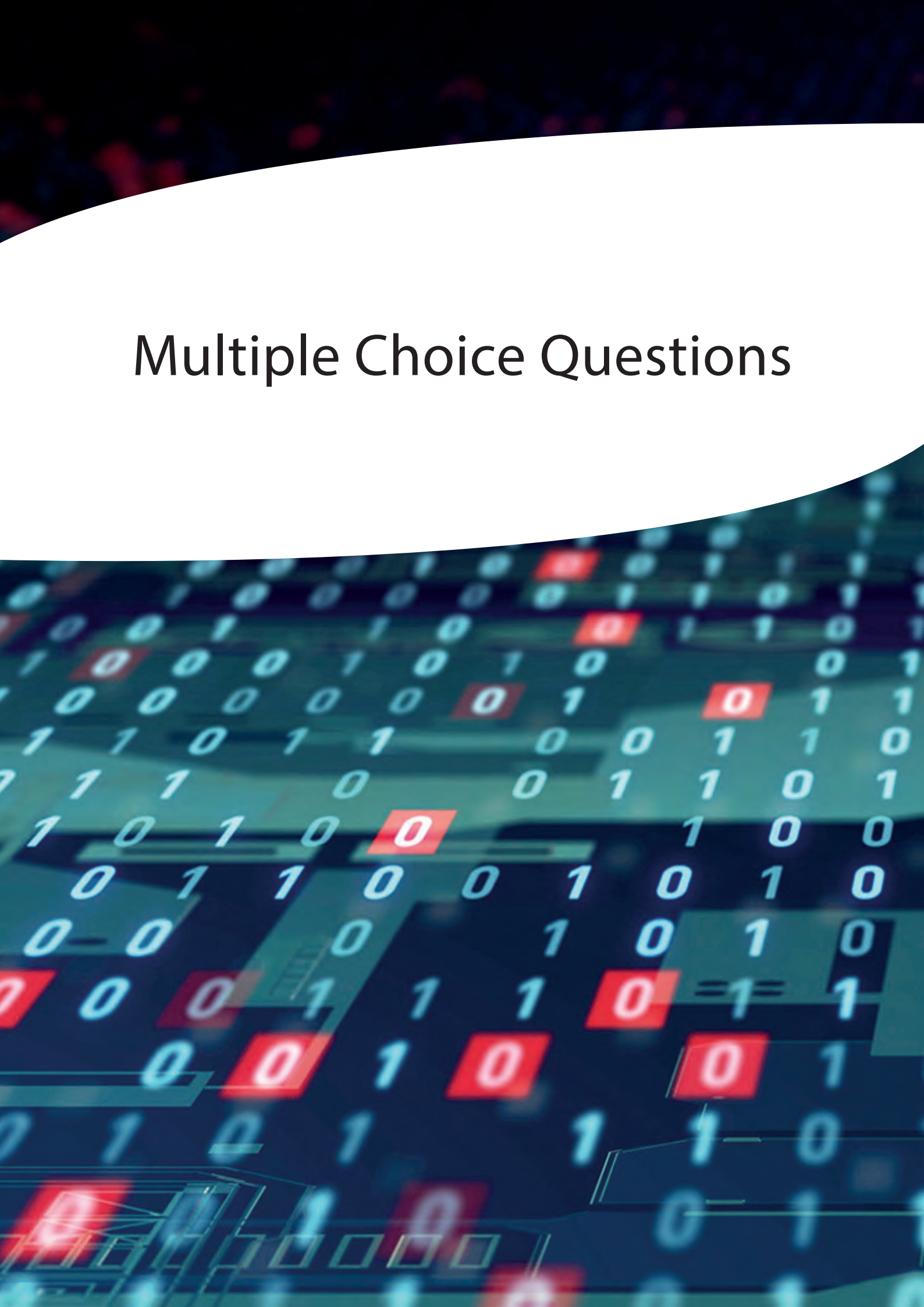
Yield Curve

The depiction of the relationship between the gross redemption yields (GRYs) and the maturity of bonds of the same type.

Zero Coupon Bonds (ZCBs)

Bonds issued at a discount to their nominal value that do not pay a coupon but which are redeemed at par on a prespecified future date.

Multiple Choice Questions



The following additional questions have been compiled to reflect as closely as possible the examination standard that you will experience in your examination. Please note, however, they are not the CISI examination questions themselves.

1. Analyse this income statement to determine the gross profit margin of this company:

Sales/revenue	332,000
Cost of goods sold	–202,000
Gross profit	130,000
Operating expenses	–78,000
Operating profit	52,000
Finance costs	–14,000
Profit Before Tax	38,000
Tax	–9,120
Net Profit	28,880

A. 29%
B. 30%
C. 39%
D. 40%

2. When a collective investment scheme is formed as a unit trust, investors are:

A. required to become trustees
B. beneficiaries of the trust
C. given limited levels of legal protection
D. in a contract with the investment management company

3. How does the lender of stock seek to protect themselves against counterparty risk and market risk?

A. By making variation margin payments
B. Through the use of a central counterparty
C. By aggregating their securities with other lenders
D. By collateralising the loan

4. **Under the capital asset pricing model, if a stock has a beta of 1.2 then this means:**

   A. It has outperformed its sector average by 20%
   B. It is 20% more volatile than the market
   C. Its profits grew by 20% over the last 12 months
   D. Its dividend level is likely to fall by 20%

5. **Which statement is correct with respect to the different categories of data sources?**

   A. Primary data is only collected by government agencies
   B. Secondary data is collected by international bodies
   C. Continuous data is restricted to specific values
   D. Discrete data can assume any value

6. **While doing some research, an investor has managed to find a number of articles that support their opinion of a stock. They also ignored some articles that did not support their opinion. The investor is displaying:**

   A. herd behaviour
   B. confirmation bias
   C. overreaction bias
   D. anchoring

7. **If a company's share price is £1.10 and its net asset value per share is £1.00, then 1.1 will represent the company's:**

   A. Price/earnings ratio
   B. Price-to-book ratio
   C. Earnings per share
   D. Z-score analysis

8. **Your client has a portfolio which is under stress owing to the sharp price fall in emerging market non-sterling equities in which it is heavily invested. To what type of risk is this portfolio chiefly exposed?**

   A. Systemic risk
   B. Interest rate risk
   C. Liquidity risk
   D. Systematic risk

9. Which of the following statements in relation to venture capital trusts (VCTs) is true?

A. VCTs are unregulated investment vehicles that do not require HMRC approval
B. VCTs are only available to institutional investors and not individuals
C. VCTs are exempt from corporation tax on gains arising from the disposal of their investments
D. VCTs primarily invest in large, low-risk companies listed on major stock exchanges

10. This table shows the returns generated by a fund over a seven-year period. What is the range of this data set?

Year	1	2	3	4	5	6	7
Percentage	2	4	2	8	5	8	6

A. 2
B. 5
C. 6
D. 8

11. Which type of structured product is designed to increase in value when the underlying index declines?

A. Accelerated tracker
B. Capital-protected tracker
C. Reverse tracker
D. Structured capital tracker

12. Company X owns 25% of the shares in Company Y and is able to exert influence over Company Y's management. How should Company X recognise this investment in its financial statements?

A. A fixed asset investment at the current market value
B. A current liability at the higher of cost or net realizable value
C. As a combined entity in its balance sheet and income statement
D. As separate entities in its statement of changes in equity and cash flow statement

13. Private equity funds frequently invest in:

A. commodities
B. derivatives
C. government bonds
D. mezzanine debt

14. The following extracts have been taken from Z plc's statement of comprehensive income for the period ending 31 December:

Income Statement Item	£000
Revenue	15,410
Cost of sales	11,375
Net operating expenses	1,675
Exceptional loss	1,308
Interest receivable	989
Tax	602

With reference to the above statement of comprehensive income, what is Z plc's operating profit and profit attributable to its shareholders respectively?

A. £4,035,000 and £1,439,000
B. £2,360,000 and £1,439,000
C. £4,035,000 and £646,000
D. £2,360,000 and £646,000

15. Bond 1 has a Standard & Poor's rating of B and Bond 2 has a Standard & Poor's rating of BBB. This usually means that Bond 1:

A. Has a higher yield than Bond 2
B. Is lower risk than Bond 2
C. Has a smaller coupon than Bond 2
D. Is cheaper than Bond 2

16. If a company's Z-score analysis is negative, this is likely to indicate that the company:

A. Has a volatile profit performance
B. Is heading for imminent insolvency
C. Has a low level of gearing
D. Is relying too heavily on a limited customer base

17. Diversification is best achieved by combining securities whose returns:

A. Are as positively correlated as possible
B. Are as weakly correlated or as close to zero as possible
C. Have similar standard deviations
D. Have widely different standard deviations

18. This table summarises the financial position of four companies:

Company	1	2	3	4
Total assets	150,665	180,000	325,000	260,000
Total liabilities	56,858	75,000	186,520	90,000

Which company has the highest equity multiplier?

A. Company 1
B. Company 2
C. Company 3
D. Company 4

19. Under the efficient market hypothesis, a market is unlikely to operate as a 'strong form efficient market' due to the existence of:

A. Insider dealing laws
B. Money laundering regulations
C. Best execution procedures
D. Data protection rules

20. As part of the rebalancing of a portfolio, a portfolio manager decides to sell and buy similar bonds in all respects apart from the yield on which both trade. The result is that the underlying client moves out of the more to the less highly priced bond. This process is known as which one of the following?

A. Bond switching
B. Anomaly switching
C. Redemption switching
D Price switching

21. Which type of environmental, social and governance (ESG) bonds are often issued to fund preventative solutions?

A. Blue bonds
B. Green bonds
C. Impact bonds
D. Social bonds

22. If an investment trust is being wound up, it is usual for it to have:

A. a large discount
B. a small discount
C. a low yield
D. a high yield

23. This table summarises the financial position of four companies:

Company	1	2	3	4
Net profit margin	0.2	0.25	0.1	0.3
Asset turnover	1.4	0.85	1.8	1.3
Equity multiplier	1.5	1.6	2.2	1.5

Which company has the highest return on equity (ROE)?

A. Company 1
B. Company 2
C. Company 3
D. Company 4

24. A company's shares are currently trading at £5. If it implements a 1-for-4 rights issue at a discounted market price of £4, what will be the theoretical ex-rights price (TERP)?

A. £4.50
B. £4.70
C. £4.75
D. £4.80

25. A form of passive management involves indexation. When undertaking indexation, it is of the upmost importance that a fund manager uses:

A. Technical analysis and a bottom-up approach
B. A top-down approach
C. An appropriate market index for their specific client
D. Fundamental analysis

26. Which of the following removes the impact of cash flows in and out of a portfolio when measuring performance?

A. Total return
B. Time-weighted rate of return
C. Holding period return
D. Money-weighted rate of return

27. The table below shows the performance and composition of a benchmark:

Benchmark		
	Asset Allocation	Return
Equities	65	–10
Bonds	35	5

An investment fund had a value of $10 million at the start of the review period, with an asset allocation of 25% in equities and 75% in bonds. In terms of performance attribution, the fund:

A. underperformed the benchmark by $500,000
B. underperformed the benchmark by $600,000
C. outperformed the benchmark by $500,000
D. outperformed the benchmark by $600,000

28. Commercial paper is normally issued with a minimum maturity of:

A. 8 days
B. 30 days
C. 6 months
D. 18 months

29. A portfolio is valued at £5,000 on 1 March and grows in value to £5,300 by 18 March. It receives a cash inflow of £325 on 19 March, and on 31 March it is valued at £5,800. What is the time-weighted rate of return of this portfolio?

A. 9%
B. 16%
C. 21%
D. 22%

30. A company decides to issue shares directly to a broker and selected financial institutions, in order to avoid extensive advertising and underwriting costs. What is this method called?

A. Placing
B. Introduction
C. Order for sale
D. Order for subscription

31. Which statement in relation to STRIPs is correct?

A. STRIPs are tax-free investments
B. STRIPs can be held within an ISA
C. It is impossible to strip a fixed coupon gilt
D. It is impossible to strip a Treasury bond

32. A portfolio was worth £500,000 at the beginning of the year and £550,000 at the end of December of that year. The transactions that took place during the year were a cash injection of £15,000 at the end of March and a cash withdrawal of £7,000 at the end of September. What is its money-weighted rate of return?

A. 8.25%
B. 8.43%
C. 11.38%
D. 11.63%

33. Which of the following characteristics is true of hedge funds? Hedge funds usually:

A. Only use derivatives for efficient portfolio management (EPM)
B. Focus on relative investment returns typically against a sector average
C. Adopt an unauthorised collective investment scheme (CIS) structure
D. Have a high correlation with world equity and bond markets

34. The S&P 500 falls into what category of benchmark?

A. Absolute
B. Broad market
C. Factor models
D. Style indices

35. Analyse the data below to determine how much interest cover this company has:

Revenue	500,000
Cost of goods sold	248,000
Operating expenses	124,000
Finance costs	6,120
Tax	23,347

A. 16.13
B. 20.91
C. 41.17
D. 81.69

36. As part of a review, the value of a company's patents was significantly reduced. This directly caused a fall in the value of which section of the company's statement of financial position?

A. Current assets – inventory
B. Current assets – trade and other receivables
C. Tangible fixed assets
D. Intangible fixed assets

37. This table shows the performance of four funds over the same time period.

Fund	Performance	Beta	Standard Deviation
1	5.3%	0.80	4%
2	5.0%	0.95	3%
3	6.5%	1.10	5%
4	4.5%	0.93	2%

If the risk-free rate of return is 2.5%, which fund has the lowest Sharpe ratio?

A. Fund 1
B. Fund 2
C. Fund 3
D. Fund 4

38. A company issued 6% cumulative redeemable preference shares at 125p. They are currently priced at 150p and can be converted into ordinary shares at the rate of 4 to 1. If the ordinary shares are priced at 500p, what is the conversion premium?

A. 5%
B. 10%
C. 15%
D. 20%

39. If a share price falls, which of the following is true?

A. P/E ratio rises; dividend yield falls
B. P/E ratio falls; dividend yield rises
C. P/E ratio rises; dividend yield rises
D. P/E ratio falls; dividend yield falls

40. Following a liquidation, there are sufficient funds to pay preference shareholders. Consequently, they will receive:

A. The pre-liquidation market price
B. The nominal value
C. The equitable value decided by the liquidator
D. The unpaid net dividends only

41. What is often quoted as a disadvantage to the overall market of high-frequency trading?

A. It can create an illusion of liquidity in a security
B. It frequently creates market price volatility
C. Algorithms create a false market as real investment impact may be absent
D. It degrades the mechanism of price formation

42. The FX forward market is widely used to speculate on:

A. Currency volatility
B. Interest rates
C. Exchange rates
D. Implied volatility

43. What does correlation measure in relation to two assets' returns?

A. The total return of each asset individually
B. The degree to which their returns move together
C. The risk level of each asset
D. The expected return of a portfolio

44. Which asset class is heterogeneous in nature?

A. Bonds
B. Commodities
C. Equity
D. Property

45. What is a key reason that companies issue global depositary receipts (GDRs)?

A. To comply with domestic listing regulations
B. To avoid foreign exchange risk
C. To establish a presence in international markets
D. To eliminate the need for a local stock exchange listing

46. Which type of company may be required to publish a special auditors' report?

A. A small private company
B. A medium-sized private limited company
C. A public limited company
D. A public listed company

47. A company's statement of financial position shows share capital of £2 million, reserves of £8 million, loans of £1.5 million, overdraft of £0.5 million and sales of £6 million. What is its asset turnover?

A. 0.10
B. 0.20
C. 0.25
D. 0.50

48. Which one of the following is compared to the current price to determine whether an investment trust share is trading at a discount or premium?

A. Bid price
B. Mid-market price
C. Net asset value
D. Offer price

49. What event will cause permanent interest-bearing securities to be reclassified as perpetual subordinated bonds?

A. A fall in their value below a threshold level
B. A series of missed interest payments
C. Completion of the prescribed investment holding period
D. Demutualisation of the issuer

50. Annual returns for a particular equity asset in each of the last six years were: 1.6%, –2.6%, 4.9%, 12.2%, 6.1% and 4.3%. What is the median return?

A. 3.9%
B. 4.4%
C. 4.6%
D. 5.1%

51. A key assumption when performing technical analysis is that:

A. Prices move in silos
B. The market discounts everything
C. Volatility is cyclical
D. Marketing aids profitability

52. This table shows an institution's bond investments over the course of a year and how they changed weightings in each issuer on a quarterly basis:

Issuer	Q1	Q2	Q3	Q4
Federal National Mortgage Association (Fannie Mae)	40%	20%	20%	20%
Local authority bonds	20%	40%	20%	20%
Asian Development Bank	20%	20%	40%	20%
US Government Treasury bills	20%	20%	20%	40%

In which quarter is the portfolio most exposed to agency debt?

A. Q1
B. Q2
C. Q3
D. Q4

53. Which of the following best describes an investment in an exchange-traded product?

A. Speculative
B. Passive
C. Long-term
D. Hedge-based

54. Which financial metric is used to measure the returns earned in excess of that which could have been earned on a risk-free asset?

A. Jensen
B. Omega
C. Sharpe
D. Treynor

55. A company has issued a convertible bond that can be converted into 15 ordinary shares per $100 nominal. The convertible is currently priced at $115 and has a 5% coupon. The share price is $7.00. What is the conversion premium?

A. 5%
B. 9.5%
C. 11.20%
D. 15.50%

56. Which index has been designed to consider the impact of fossil fuel reserves?

A. Dow Jones Sustainability
B. FTSE4Good
C. MSCI KLD 400
D. MSCI Low Carbon

57. Within a market of perfect competition, which of the following best describes why firms make only a normal profit in the long term on a single homogeneous product?

A. Because the price is set by the interaction of consumer demand for the industry's total supply
B. Because the typical supply and demand ratios will always show a tail-off in demand after an initial buoyancy for any consumer product
C. Because, on a single product offering, supply will ultimately always exceed demand, leading to the falling away of around 30% of competitors with the first two years of product production
D. Because economic prosperity is cyclical in nature, leaving firms with both a volatile profit history and predicted profit forecast charts

58. Gary purchased a house in 1996 for £250,000. It is now valued at £1,100,000 and he could receive £3,000 monthly rent with monthly expenses of £1,500.What is the net rental yield on this property?

A. 1.64%
B. 3.27%
C. 7.2%
D. 14.4%

59. Which of the following is the formula to calculate debt-to-equity ratio?

A. (Interest-bearing debt + Preference shares) / Ordinary shareholders' equity
B. (Total Assets - Total Liabilities) / Total Equity
C. Net Income / Total Debt
D. Profit after interest / interest payable

60. How is the initial cost of subscribing for shares in a company represented in the shares held?

A. As a percentage of net present value
B. In the nominal value
C. From the initial deposit receipt
D. (Current Liabilities + Long-term Liabilities) / Total Revenue

61. What is the optimum time period within which to use volume weighted average price analysis?

A. Seconds
B. Minutes
C. Hours
D. Intraday

62. An upward-sloping yield curve is an indication that:

A. The market expects interest rates to decline
B. There is little difference between short and long-term rates
C. Longer-dated stocks yield less than shorter-dated stocks
D. Long-term interest rates are higher than short-term interest rates

63. What fact does the efficient markets hypothesis (EMH) state, that is regarded as somewhat controversial?

A. Returns on stock markets historically do not outperform deposit returns
B. It is not possible to beat the market
C. Gold is never a safe haven in turbulent markets
D. To guarantee a return, do not use public markets

64. This table shows the performance of four funds over the same time period.

Fund	Performance	Beta	Standard Deviation
1	8%	0.90	5%
2	5%	0.95	5
3	11%	1.10	6%
4	4%	0.93	1%

If the risk-free rate of return is 2.5%, which fund has the highest Treynor ratio?

A. Fund 1
B. Fund 2
C. Fund 3
D. Fund 4

65. When assessing country risk, what is the significance of a sovereign bond issuer's credit rating reducing?

A. A higher yield is required by investors
B. Default risk is reducing
C. A lower yield is required by investors
D. The credit spread is unchanged

66. In what way do deferred shares differ from non-voting shares?

A. Deferred shares always have normal voting rights
B. The dividends for deferred shares will not be paid for a period of time
C. Non-voting shares never carry an entitlement to rights issues
D. Deferred shares cannot be dematerialised

67. What is the main feature of a Bermudan-style option that differentiates it from a European or American option?

A. It can only be dealt in US dollars
B. It can be exercised on pre-determined dates before expiry
C. They are not regarded as derivatives
D. A position always contains both a put and a call

68. Which product derives value from the ratio between currency pairs?

A. Forwards
B. Futures
C. Options
D. Swaps

69. Under US company law, shareholders have limited liability and have no individual liability for any of the company's debts. How is this reflected in the classification of the shares?

A. They are scripless
B. They have no par value
C. They are always in bearer form
D. Each certificate has its own notation

70. Which of the following statements about counterparty risk is true?

A. Counterparty risk is only relevant for exchange-traded instruments
B. Government bonds always carry a high level of default risk
C. A central counterparty reduces counterparty risk by acting as an intermediary in trades
D. Moving OTC transactions to exchanges increases counterparty risk

71. What is regarded as the most important method of client communication in order for clients to keep track of their portfolio performance?

A. Through the prescribed frequency and mode of client reporting and the issuance of portfolio statements under MiFID
B. Via a web-based portal, secured with password access
C. By proactive liaison by telephone at least once daily between the investment manager and the client
D. Through media data, provided to provide real-time or near real time (delayed) pricing data

72. Why would an investor analyse a cash flow statement?

A. To calculate the size of the next dividend
B. To establish the level of depreciation within the company
C. To calculate their level of accrued expenses
D. To establish if the company is reliant on fixed asset sales and borrowing

73. During which quarter was liquidity at its highest?

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Current assets	£540,000	£560,000	£500,000	£520,000
Stock	£86,100	£70,000	£70,000	£85,000
Current liabilities	£520,000	£500,000	£560,000	£540,000

A. Quarter 1
B. Quarter 2
C. Quarter 3
D. Quarter 4

74. Which of the following factors is most likely to influence energy prices?

A. The stock market performance of technology companies
B. Changes in fashion trends and consumer preferences
C. The availability of precious metals like gold and silver
D. Supply restrictions imposed by OPEC

75. Of the following four index-linked gilts, which would have the longest period between the reference inflation rate and the interest payment date?

A. Issued in May 2001 with a 4.125% coupon, maturing in 2026
B. Issued in June 2010 with a 2.25% coupon, maturing in 2060
C. Issued in December 2018 with a 3.875% coupon, maturing in 2053
D. Issued in July 2024 with a 0.125% coupon, maturing in 2064

76. What is a key difference between the Enterprise Investment Scheme (EIS) and the Seed Enterprise Investment Scheme (SEIS)?

A. SEIS is for start-ups; EIS supports larger companies
B. SEIS companies cannot raise funds through EIS or VCT
C. SEIS is for early-stage firms; EIS allows larger ones
D. SEIS has an employee limit; EIS allows more employees

77. **This table shows the performance of four funds over the same time period. It also shows their expected performance according to the capital asset pricing model (CAPM).**

Fund	CAPM	Performance
1	5%	7%
2	4%	5%
3	3%	7.5%
4	2%	4%

Which fund has the highest Jensen's alpha?

A. Fund 1
B. Fund 2
C. Fund 3
D. Fund 4

78. **If the payment of an operating-related liability is expected on a certain date but there is no certainty of the actual amount, how is this categorised for accounting purposes?**

A. Payable
B. Provision
C. Current liability
D. Accrual

79. **This table shows the standard deviation of two different assets:**

Asset 1	8
Asset 2	12

If they have a covariance of 27, what is their correlation?

A. 0.28
B. 1.35
C. 7.00
D. 18.00

80. An investment manager is assessing the performance of an index-tracking fund. Which of the following would generally be expected when using alpha as the basis of tracking performance?

A. A large negative alpha

B. A small positive alpha

C. An alpha of zero or near zero

D. A large positive alpha

Answers to Multiple Choice Questions

1. C Chapter 3, Section 3.3.3

Solution: (130,000 / 332,000) x 100 = 39%.

2. B Chapter 5, Section 2.6

A trust is created by a legal deed between the manager of the trust and the trustee. The investor is a beneficiary of the trust and owns units of the trust.

3. D Chapter 1, Section 3.4

Usually, the lender will seek collateral from the borrower in the form of cash or other securities of equal or greater value than those lent. Collateralising the loan protects the lender against both counterparty risk and market risk.

4. B Chapter 1, Section 10.3

Beta (β) measures the volatility (or systematic risk) of a portfolio compared to the broader market; therefore, it helps investors to understand the level of risk that they will be willing to take in order to achieve a particular return:

The beta coefficient is an important piece of the CAPM. The beta value helps investors understand the level of risk they will be willing to take to achieve the return for taking said risk:

- If $\beta=1$, the portfolio/investment has a similar volatility to (and moves in line with) the market as a whole.
- If $\beta>1$, it is more volatile than the market as a whole. For example, if a security has a β of 1.5, then it has 50% greater volatility than the market portfolio.
- If $0<\beta<1$, it is less volatile than the market as a whole. For example, a security with a beta of 0.7 has 30% less volatility.
- If $\beta<0$, then the security moves in the opposite direction to the stock market. The number gives the strength of this relationship.
- If $\beta=0$, so there is no clear relationship between the two.

5. B Chapter 6, Section 1.2

Secondary data is collected by government agencies and other international bodies which is then distributed in a convenient form. This data typically requires further analysis if each user is to maximise the value of the information contained within it.

6. B Chapter 1, Section 11.1.2

Individuals are more likely to seek information that confirms their existing position than contradicts it, or perhaps interpret ambiguous information as supporting this viewpoint. As a result, they ignore potentially useful information that refutes their preconceptions.

7. **B** **Chapter 3, Section 3.5.4**

Price-to-book ratio = Share price / Net asset value per share.

8. **D** **Chapter 1, Section 10.2**

Some risks are difficult to avoid. These risks (known as systematic risk) are ones which affect the financial system as a whole. They are likely to affect pretty much all investments, as they are inherent in the aggregate market, so cannot be mitigated and removed by diversification. Hence, systematic risk is also called market risk, undiversifiable risk or aggregate risk.

9. **C** **Chapter 4, Section 4.1**

Venture capital trusts (VCTs) are UK-specific investment vehicles that are listed on the LSE. They are similar to investment trusts, in that they allow individuals to invest indirectly in a portfolio of small, higher-risk trading companies, whose shares and securities are often not listed on a recognised stock exchange.

Investment in VCTs attracts special tax advantages; hence VCTs must gain HMRC approval to be treated as such. Once approved, VCTs are exempt from corporation tax on any gains arising from the disposal of their investments.

10. **C** **Chapter 6, Section 2.3.1**

The simplest measure of dispersion is the range, which is the difference between the highest and lowest values in a data set.

Hence, range 8 – 2 = 6

11. **C** **Chapter 5, Section 4.3.4**

A reverse tracker is similar to a standard tracker except that, if the underlying asset fall, then the value of the tracker will rise.

12. **C** **Chapter 3, Section 1.5.2**

If a shareholding represents at least 20% of company B's voting capital or company A is in a position to exert considerable influence over company B's management, then company A is required to show the position of the combined entity in its statement of financial position and comprehensive income.

13. **D** **Chapter 4, Sections 3.4 and 7.2**

Private equity is a key source of funding for many companies and can take the form of equity, bond or a combination of the two, called mezzanine financing.

14. **B** **Chapter 3, Sections 1.3**

Operating profit = 15,410 – 11,375 – 1,675 = 2,360

Profit attributable to shareholders = 2,360 + 989 – 1,308 – 602 = 1,439

15. A Chapter 1, Section 12.5.3

Securities with ratings in the BB category and below are considered high-yield or below investment grade.

16. B Chapter 3, Section 3.4.3

A Z-score analysis is is a statistical measure that generally considered a more detailed way of establishing whether a company is dangerously close to becoming insolvent within a two-year period.

17. B Chapter 3, Section 4.4

When correlations are low or close to zero (ie, asset returns do not move in tandem), then gains in one asset are less likely to be offset by losses in the other. This can help to reduce the overall risk of a portfolio without sacrificing the return. This reduction in risk for a given level of expected return is the essence of diversification.

18. C Chapter 3, Section 3.3.3

Net assets (total assets less liabilities) = Shareholders funds

where shareholders funds = net assets (total assets less liabilities)

Company	1	2	3	4
Total assets	150,665	180,000	325,000	260,000
Total liabilities	56,858	75,000	186,520	90,000
Shareholders funds	93,807	105,000	138,480	170,000
Equity multiplier	1.606117	1.714286	**2.346909**	1.529412

19. A Chapter 1, Section 10.1

Strong form – share prices reflect all available information and no-one can earn excess returns. Insider dealing laws should make strong form efficiency impossible, except where they are universally ignored.

20. B Chapter 1, Section 2.3

Anomaly switching moves between similar bonds differing only in price, switching from the expensive to the cheaper bond.

21. C Chapter 5, Section 5.1.1

Impact bonds are designed to fund prevention and early intervention. Impact debt is designed to be responsive to the needs of vulnerable groups to improve their lives.

22. B Chapter 5, Section 2.8.1

Investment trust company shares generally trade at a discount to their NAV. A number of factors contribute to the extent of the discount, and it will vary across different investment trust companies. Most importantly, the discount is a function of the market's view of the quality of the investment trust and its choice of underlying investments. A smaller discount (or even a premium) will be displayed if investment trusts are nearing their winding-up, or about to undergo some corporate activity such as a merger/takeover.

23. D Chapter 3, Section 3.3.3

Return on equity = Net profit margin x Asset turnover x Equity multiplier

Company	1	2	3	4
Net profit margin	0.2	0.25	0.1	0.3
Asset turnover	1.4	0.85	1.8	1.3
Equity multiplier	1.5	1.6	2.2	1.5
ROE	**42**	**34**	**39.6**	**58.5**

24. D Chapter 4, Section 10.6.4

If, for example, 20 shares are held, the post-issue share price will be ((20 x 5) + (5 x4)) / 25 = £4.80.

25. C Chapter 1, Section 2.2.1

Indexation is a variant of the 'buy and hold' strategy that eliminates the diversifiable risk and effectively replicates the performance of a market index; hence, it is also known as index matching. There are several different ways of proceeding with respect to indexation, but the most fundamental one is to decide on the appropriate index for the client, as there are many different market indices available.

26. B Chapter 6, Section 7.3

From portfolio construction theory, it is generally accepted that a time-weighted rate of return (TWRR) is the most suitable for determining the returns achieved from an investment. This is because the TWRR removes the impact of cash flows on the rate of return calculation.

The TWRR is established by breaking the investment period into sub-periods. A sub-period is created whenever there is a movement of capital into or out of the fund. Immediately prior to this point, a portfolio valuation must be obtained to ensure that the rate of return is not distorted by the size and timing of the cash flow.

27. **D** **Chapter 6, Section 8.6**

Benchmark				
	Asset Allocation	Value at Start of the Period	Return	Value at End of Period
Equities	65	6,500,000	–10	5,850,000
Bonds	35	3,500,000	5	3,675,000
				9,525,000

Fund Manager				
	Asset Allocation	Value at Start of the Period	Return	Value at End of Period
Equities	25	2,500,000	–10	2,250,000
Bonds	75	7,500,000	5	7,875,000
				10,125,000

Attribution = 10,125,000 – 9,525,000= 600,000. Hence, the fund outperformed the benchmark by $600,000.

28. **A** **Chapter 4, Section 5.2**

Commercial Paper (CP)

(CP) consists of unsecured, short-term promissory notes issued by companies to finance their short-term liquidity needs. They are issued at a discount to par, with a maturity of between eight and 365 days.

29. **A** **Chapter 6, Section 7.3**

$$R_SP1 = \frac{(5{,}300 - 5{,}000)}{5{,}000} = \frac{3}{50} = 6\%.$$

$$R_SP2 = \frac{(5{,}800 - (5{,}300 + 325))}{(5{,}300 + 325)} = \frac{7}{225} = \frac{28}{9}\% \approx 3.1\%$$

$$TWRR = (1 + 0.06) \times (1 + 0.031) - 1 = 0.09 \text{ or } 9\%$$

30. A Chapter 4, Section 10.5.3

A placing is the least expensive IPO method, as the prospectus accompanying the issue is less detailed compared other two methods, and no underwriting or extensive advertising is necessary. For this reason, a placing is the preferred new issue route for companies looking to list on smaller or alternative markets.

31. B Chapter 4, Section 6.2.3

In the UK, STRIPs can be held by individuals within individual savings accounts (ISAs) on the same basis as conventional and index-linked gilts.

32. A Chapter 6, Section 7.2

The MWRR is:

$$\frac{£550\,000 - £500\,000 - £8\,000}{\left[£500\,000 + \left(£15\,000 \times \frac{9}{12}\right) + \left(-£7\,000 \times \frac{3}{12}\right)\right]}$$

$$\frac{£42\,000}{£500\,000 + £11\,250 - £1\,750}$$

$$\frac{£42\,000}{£509\,500} = 8.25\,\%$$

33. C Chapter 5, Section 6.1.1

Structure – most hedge funds are set up either as private partnerships in the US or as unauthorised collective investment schemes in offshore financial centres. An investment bank, known as a prime broker, typically provides the fund with trading and credit facilities as well as administrative support, while fund management is usually conducted in a major financial centre such as New York or London.

34. B Chapter 6, Section 8.4.1

Broad market indices are well-recognised, easy to understand and readily measurable. Their drawback is that a manager's investment style may differ significantly from the index.

35. **B** **Chapter 3, Section 3.6.2**

Revenue	500,000
Cost of goods sold	248,000
Gross profit	252,000
Operating expenses	124,000
Finance costs	6,120
Profit Before Tax	121,880
Tax	23,157
Net Profit	98,723

Interest cover (x) = Profit before interest and tax / Interest payable = (121,880 + 6,102) / 6,120 = 20.91

36. **D** **Chapter 3, Section 1.2.1**

Ownership of an intangible fixed asset confers certain rights. These rights give a company a competitive advantage over its peers and commonly include brand names, patents, trademarks and purchased goodwill.

37. **A** **Chapter 6, Section 9.1**

Fund	Performance	SD	Risk Free	Sharpe
1	5.3%	4%	2.5%	0.69
2	5.0%	3%	2.5%	0.83
3	6.5%	5%	2.5%	0.80
4	4.5%	2%	2.5%	1.00

38. **D** **Chapter 4, Section 2.2**

Conversion premium or discount = ((4 x 150) / 500) – 1 = 0.2 or 20%.

39. **B** **Chapter 3, Sections 3.5.2 and 3.5.3**

P/E ratio = Share price / Earnings per share

Dividend yield = Net dividend per share / Share price

A fall in the price will lower the P/E ratio and raise the dividend yield.

40. A Chapter 4, Section 2.2.6

In the UK, the order of priority for payment is governed by the Insolvency Act 1986, as outlined below:

1. Fixed-rate loans and bonds secured on the assets of the company.
2. Preferential creditors.
3. Floating-rate loans and bonds secured on the assets of the company.
4. Unsecured loans and bonds and other unsecured creditors.
5. Subordinated loan stocks.
6. Preference shares.
7. Ordinary shares.

41. A Chapter 4, Section 11.3

One major concern is that HFT can create the illusion of liquidity – eg, HFT firms might make rapid trades in a stock without actual buying or selling pressure, potentially misleading traditional investors.

42. B Chapter 4, Section 9.3.1

Since forward rates are influenced by the interest rate differential between two currencies, the FX forward market is used to speculate on expected changes in the difference between these two interest rates.

43. B Chapter 2, Section 4.4.1

The degree to which two assets' returns are related is measured by correlation, which ranges from +1 (perfectly positive) to -1 (perfectly negative).

44. D Chapter 5, Section 7

Property, as an asset class, is unique in its distinguishing features, one of which is heterogeneity.

Each property is unique in terms of location, structure and design.

45. C Chapter 4, Section 3.1.2

In some cases, GDRs are created not just to raise capital but also to establish a presence in new markets, in order to increase the company's visibility and pave the way for future offerings.

46. B Chapter 3, Section 1.1

Medium-sized companies may need to publish an abridged auditors' report (termed a special auditors' report).

47. D Chapter 3, Section 3.3.2

Asset turnover = Sales / Capital employed = 6 / (2 + 8 + 1.5 + 0.5) = 6 / 12 = 0.5

48. C Chapter 1, Section 2.8.1

Shares in investment trusts are not priced directly in relation to the fund's NAV, but in accordance with investor demand. NAV is calculated as an open-ended fund, but investment trusts trade at either a premium (ie, above the NAV) or a discount (ie, below the NAV) depending on the share price performance. The premium/discount is calculated as a percentage so investors can see how much the current share price is relative to its NAV per share.

49. D Chapter 4, Section 6.3.2

PIBS are issued by mutual building societies. If the building society has demutualised, its PIBS are reclassified as PSBs.

50. C Chapter 6, Section 2.1

The two mid-range values (3rd and 4th) are 4.3% and 4.9%, so median = (4.3% + 4.9%) / 2 = 4.6%.

51. B Chapter 6, Section 6

The core assumptions of technical analysis are that:

- the market discounts everything
- prices move in trends, and
- history tends to repeat itself.

52. A Chapter 4, Section 6.2.2

Government-sponsored agencies (GSAs), known as 'agency bonds'. These are particularly common in the US, with examples including the Federal Home Loan Banks (FHLBs), the Federal National Mortgage Association ('Fannie Mae') and the Federal Home Loan Mortgage Corporation ('Freddie Mac').

Issuer	Q1	Q2	Q3	Q4
Federal National Mortgage Association (Fannie Mae)	**40%**	20%	20%	20%
Local authority bonds	20%	40%	20%	20%
Asian Development Bank	20%	20%	40%	20%
US Government Treasury bills	20%	20%	20%	40%

53. B Chapter 5, Section 2.3

The majority of ETPs are passive investments, aiming to replicate the performance of a given market or benchmark index by investing in the constituents of that index (or a representative sample thereof).

54. D Chapter 6, Section 9.2

The Treynor ratio measures the returns earned in excess of what could have been earned on a risk-free asset. It is sometimes called the 'reward-to-volatility ratio', as it relates the excess return over the risk-free rate to the additional risk taken as measured by the beta of the fund or portfolio/fund.

55. B Chapter 4, Section 2.2.2

The conversion premium/discount is calculated as follows:

$$\left[\text{Conversion premium or discount} = \frac{(\text{Conversion ratio x market price of convertible shares})}{\text{Market price of ordinary shares}} - 1\right]$$

CB price	115
Per 100	15
Share price	7
Conversion choice	105
Premium	10
%	9.52%

56. D Chapter 5, Section 5.4

MSCI Low Carbon Index family is part of a family of global equity indices based on the main market-cap indices. According to MSCI, the indices help identify potential risks associated with the transition to a low carbon economy while representing the performance of the broad equity market. The first benchmarks are designed to address carbon emissions and fossil fuel reserves.

57. A Chapter 1, Section 8.6.1

A perfectly competitive firm operates within an industry containing an infinite number of firms, each of which accepts the market price for a homogeneous product set by the interaction of consumer demand for the industry's total supply. In the long run, perfectly competitive firms only generate normal profits.

58. A Chapter 5, Section 7.2.2

Net rental yield = (Annual rental income – Operational costs) / Property value = ((3,000 x 12) – (1,500 x 12)) / 1,100,000 = 0.0164 or 1.64%

59. A Chapter 3, Section 3.7.1

Debt-to-equity ratio = (Interest-bearing debt + Preference shares) / Ordinary shareholders' equity

60. B Chapter 4, Section 2.2.1

When a company is launched, individuals pool funds together to form the company. They may contribute equal or different amounts, and in return for their contribution, they will have a share in the company. This share represents their ownership interest and is represented by the number of shares they hold. Each share has a nominal value.

61. **D** **Chapter 2, Section 11.5**

The volume weighted average price (VWAP) is a technical analysis tool to identify intra-day market trends.

62. **D** **Chapter 1, Section 6.2.3**

A normal yield curve has a positive (upward) slope, reflecting that securities with more time remaining to maturity have a slightly higher yield than shorter-dated securities. More broadly, an upward-sloping yield curve depicts the time value of money – investors will generally require a higher yield, or a premium over shorter-maturity bonds, for tying up their invested capital for longer. This observed term premium is due to greater uncertainty over longer future periods.

63. **B** **Chapter 1, Section 10.1**

The efficient markets hypothesis (EMH) states that it is impossible to beat the market, as prices already incorporate and reflect all relevant information. It is also a highly controversial and often disputed theory.

64. **C** **Chapter 6, Section 9.2**:

Fund	Performance	Beta	SD	Risk Free	Treynor
1	8%	0.90	5%	2.5%	0.06
2	5%	0.95	5	2.5%	0.03
3	11%	1.10	6%	2.5%	0.08
4	4%	0.93	1%	2.5%	0.02

65. **A** **Chapter 4, Section 6.1.6**

Bonds rated below BBB or Baa3 are classified as non-investment grade, also referred to as high yield, speculative or junk bonds. Non-investment grade bonds have a higher probability of defaulting on their interest payments or principal repayment, which makes them riskier for investors. To compensate for this higher risk, these bonds typically trade at lower prices and offer higher coupon rates (or 'default premiums') to reflect the added risk that investors are assuming.

66. **B** **Chapter 4, Section 2.2.1**

In order to retain an element of control, a company's original promoters may have deferred, (or founders), shares that confer enhanced voting rights in exchange for their right to a dividend being deferred for a set period or until a condition has been met.

67. **B** **Chapter 4, Section 8.1.1**

Bermudan-style – an option that can be exercised on pre-determined dates before expiry, usually once a month. Such options are a combination of American- and European-styles, thus they are hybrid securities.

68. D Chapter 5, Section 8.4

In a swap transaction involving a currency pair, the buyer gains and a seller loses when the primary currency interest rate increases relative to the secondary currency interest rate. More specifically, it is the ratio between the two rates that matters: if the ratio increases from the perspective of the primary currency, the buyer of the primary currency will gain, and the seller of the secondary currency will lose.

69. B Chapter 4, Section 2.2.1

Under company law, a company's shareholders have what is known as limited liability. This means that they have no personal liability for the payment of the company's debts. Their liability extends only to the extent of any outstanding payment on the nominal value of the company's shares held if issued partly paid.

70. C Chapter 2, Section 4.1.1

The use of a central counterparty (CCP), such as the London Clearing House (LCH), reduces the uncertainty and risk associated with counterparty risk. The risk that the other side of the transaction will default is reduced because they are replaced by one of the central counterparties, both of which are well capitalised and have insurance policies in place lessening the risk of default.

71. B Chapter 2, Section 3.2.2

The most appropriate method for client communication is for information to be made available to clients on a current, probably real-time, basis via the internet. Many portfolio managers will provide clients with a monitoring facility enabling them to inspect their portfolio performance, at least in summary form, via web-based portals.

72. D Chapter 3, Section 1.4

An analysis of the statement of cash flows shows the importance of generating positive cash flow at the operating level. Without this, a company may become reliant upon fixed asset sales and borrowing to finance its day-to-day operations.

73. B Chapter 3, Sections 3.4.1 and 3.4.2

The working capital ratio (more commonly referred to as the current ratio) is simply calculated by dividing a company's current assets by its current liabilities as follows:

Current ratio = Current assets / Current liabilities

The quick ratio (also known as the acid test or liquidity ratio) excludes stock from the calculation of current assets, in order to give a tighter measure of a company's ability to meet a sudden cash call.

The formula for liquidity ratio is:

$$\text{Liquidity ratio} = \frac{\text{Current assets} - \text{Stock}}{\text{Current liabilities}}$$

Applying these formulae, Liquidity was at its highest in Q2, as measured by current ratio and liquidity ratio.

	Q1	Q2	Q3	Q4
Current assets	£540,000	£560,000	£500,000	£520,000
Stock	£86,100	£70,000	£70,000	£85,000
Current liabilities	£520,000	£500,000	£560,000	£540,000
Acid test	0.87	0.98	0.77	0.81
Current ratio	1.04	1.12	0.89	0.96

74. D Chapter 5, Section 9.1.2

Prices could be raised by producers restricting supply, as seen with the actions of the major oil producers within the Organisation of the Petroleum Exporting Countries (OPEC).

75. A Chapter 4, Section 6.2.1

For index-linked bonds (ILBs), the rate of inflation used to calculate interest and principal payments is typically measured with a three-month indexation lag; however, UK index-linked gilts (ILGs) issued before September 2005 are an exception with an eight-month lag.

76. C Chapter 4, Section 4.3

Unlike EISs, SEISs focus on small and very early-stage companies. The scheme finances start-ups, to stimulate entrepreneurship and boost economic growth.

77. C Chapter 6, Section 9.3

The Jensen measure of risk-adjusted returns is used to evaluate the performance of a well-diversified portfolio/fund by comparing it to a capital asset pricing model (CAPM) benchmark, which assumes that the portfolio/fund takes on the same level of systematic risk as the benchmark.

Jensen measure = (Return on the portfolio – Return predicted by CAPM)

The extent of any outperformance or underperformance is known as Jensen's alpha.

The Jensen measure establishes whether the portfolio has performed in line with its CAPM benchmark and, therefore, lies on the security market line (SML) or whether it has outperformed or underperformed the benchmark and is, therefore, positioned above or below the SML.

- A portfolio that generates a positive alpha will plot above the SML.
- A portfolio that generates a zero alpha will plot on the SML.
- A portfolio that generates a negative alpha will plot below the SML.

Fund	CAPM	Performance	Jensen
1	5%	7%	2%
2	4%	5%	1%
3	3%	7.5%	4.5%
4	2%	4%	2%

78. D Chapter 3, Section 1.2.2

Accruals are liabilities for which the timing of payment is generally known, but the amount to be paid is uncertain. Accruals normally arise from routine transactions of the business, either of an operating or financing nature.

79. A Chapter 6, Section 3

$$\rho PQ = CovPQ / \sigma P \sigma Q = 27 / (8 \times 12) = 0.28.$$

80. C Chapter 2, Section 4.4

While the alpha measurement is often described as a single number in reality, it is illustrating the percentage of performance with relation to how a portfolio performed compared to a benchmark index. In this case, therefore, an alpha of zero or near zero would be expected for an index-tracking fund.

Syllabus Learning Map

Syllabus Unit/ Element		Chapter/ Section
Element 1	**The Investment Management Industry**	**Chapter 1**
1.1	**Investment Strategy** On completion, the candidate should:	
1.1.1	Know the concepts behind: • top-down investing • bottom-up investing • active management • passive management • quantamental investment	2
1.2	**Activities** On completion, the candidate should:	
1.2.1	Know investment activities associated with: • pension funds and patient capital • life assurance funds • hedge funds • retail investment funds • family offices • managed futures funds • money market funds • manager of manager funds	3
1.2.2	Know the purpose of a centralised investment proposition	4
1.2.3	Know different types of fund structure and underlying corporate structures	Chapter 5, section 1
1.3	**Ancillary Activities** On completion, the candidate should:	
1.3.1	Know the facilities offered by: • model portfolio service (MPS) providers • discretionary fund management (DFM) service providers • prime brokers • transfer agents	4
1.3.2	Understand how stock lending operates and the risks involved	4.5
1.4	**Investment Theory** On completion, the candidate should:	
1.4.1	Be able to assess the main propositions and limitations of the efficient markets hypothesis (EMH): • strong form • semi-strong form • weak form • assumptions and shortcomings • impact of dark pools and big data on information efficiency	10.1

Syllabus Unit/ Element		Chapter/ Section
1.4.2	Be able to assess the main principles of modern portfolio theory, the capital asset pricing model (CAPM), its application and limitations: • risk-free rate of return • risk premium • cost of capital and return on capital • excess returns • correlation measures • risk and diversification • efficient frontier, portfolio optimisation and leverage • assumptions and shortcomings	10.2
1.4.3	• Be able to assess the main principles behind arbitrage pricing theory (APT), its application and limitations: • factor structure and analysis • macroeconomic and market factors • arbitrage theory and mechanics • relationship with CAPM • assumptions and shortcomings	10.4.2
1.4.4	Know the principles of behavioural finance:	11
1.5	**Investment Styles** On completion, the candidate should:	
1.5.1	be able to assess the main aims and investment characteristics of the following cash, bond and equity portfolio management strategies and styles: • indexing/passive management • active/market timing • passive-active combinations	2
1.5.2	Be able to assess the main aims and investment characteristics of the following cash, bond and equity portfolio management strategies and styles: • growth/income/value • market capitalisation • liability driven	2
1.5.3	be able to assess the main aims and investment characteristics of the following cash, bond and equity portfolio management strategies and styles: • long, short and leveraged • issuer and sector-specific • high conviction and patient capital	5.1
1.5.4	Be able to assess the main aims and investment characteristics of the following cash, bond and equity portfolio management strategies and styles: • contrarian • quantitative	2

Syllabus Unit/ Element		Chapter/ Section
1.5.5	Be able to assess the main aims and investment characteristics of the following cash, bond and equity portfolio management strategies and styles: • ethical, responsible, sustainable investment	5.2
1.6	**Value Drivers** On completion, the candidate should:	
1.6.1	Assess the macroeconomic tools and mechanisms that central banks and supranational organisations use and how they have been applied during recent economic cycles: • quantitative easing • control of the yield curve • evolution of the principle of lenders of last resort • rate controls • other mechanisms	6
1.6.2	Be able to assess economic factors that influence market prices: • economic statistics • leading and lagging indicators • inequality of information • market structure	8
1.6.3	Know key factors that influence market prices: • company announcements • research material • credit ratings • market liquidity • bid-ask spreads • the media	9
1.6.4	Know how research costs are paid for	9
Element 2	**Managing Client Portfolios**	**Chapter 2**
2.1	**Fiduciary Issues** On completion, the candidate should:	
2.1.1	Understand stewardship responsibilities; issues associated with conflicts of interest and the duty to clients; transparency obligations	1.1

Syllabus Unit/ Element		Chapter/ Section
2.2	**Suitability** On completion, the candidate should:	
2.2.1	Understand the factors to consider when establishing investment management relationships: • mandate • client categorisation • objectives • risk appetite and existing risk exposure • suitability • impact of fees, charges, commission and tax • mandatory or voluntary investment restrictions • discretionary and non-discretionary portfolio management • limits of authority	2
2.2.2	Know the factors that dictate effective portfolio management: • asset allocation • time horizons • liquidity requirements • diversification	2
2.2.3	Understand key elements involved in managing a client portfolio: • systematic and compliant approach to client portfolio monitoring, review, reporting and management • selection of appropriate benchmarks to include market and specialist indices, holding period return and maximum drawdown • arrangements for client communication	3.2
2.3	**Portfolio Risk** On completion, the candidate should:	
2.3.1	Be able to assess the following types of risk and their implications for investors: • systemic risk • market risk – asset price volatility, currency, interest rates, commodity price volatility • investment horizon • liquidity • credit risk and default • counterparty risk • inflation • sustainability risk	4
2.3.2	Be able to assess how to reduce portfolio risk through diversification and hedging: • significance of alpha and beta • correlation and relative risk • principles of asset allocation • hedging and immunisation • active and passive strategies	4.4

Syllabus Unit/ Element		Chapter/ Section
2.4	**Market Activity** On completion, the candidate should:	
2.4.1	Be able to assess characteristics of: • traditional investment exchanges • alternative trading platforms	5
2.4.2	Know the basic principles of algorithmic trading	5.3
2.4.3	Understand the concept of volume weighted average price (VWAP)	5.4
2.4.4	Know the concept of an Algo wheel	5.5
2.4.5	Know the principles underpinning transaction cost analysis	5.6
2.4.6	Be able to assess the implications of executing transactions: • on-exchange • over-the-counter (OTC)	5.7
2.5	**Operational Risk** On completion, the candidate should:	
2.5.1	Be able to assess the main operational risks in dealing internationally	6
2.5.2	Be able to assess the risks associated with global investment: foreign currency risk country risk	6.1.1
2.6	**Rebalancing** On completion, the candidate should:	
2.6.1	Be able to assess how changes can affect the management of a client portfolio: • client circumstances • financial environment • new products and services available • administrative changes or difficulties • investment-related changes (eg, credit rating, corporate actions) • portfolio rebalancing • benchmark review • client churn • time out of the market • portfolio turnover cost	7

Syllabus Unit/ Element		Chapter/ Section
Element 3	**Valuation**	**Chapter 3**
3.1	**Company Accounts** On completion, the candidate should:	
3.1.1	Know the legal requirements to prepare accounts and the differences between private and public company requirements:	1
3.1.2	Understand the purpose and main contents of the Statement of Financial Position: • fixed assets • current assets • current liabilities • long term borrowing • issued share capital • capital reserves • revenue reserves • the concept and implications of off-balance sheet finance	1.2
3.1.3	Understand the purpose and main contents of the statement of comprehensive income: • revenue • cost of sales • depreciation charge • interest income/expenditure • investment income • taxation • profit • extraordinary items and exceptional items • other comprehensive income	1.3
3.1.4	Know the purpose and main contents of the statement of cash flows: • operating activities • investing activities • financing activities	1.4
3.1.5	Understand the basic principles of accounting for: • associated companies • subsidiaries • minority interests	1.5
3.2	**ESG Factors** On completion, the candidate should:	
3.2.1	Know: • ESG disclosure mechanisms • the concept of materiality assessments: Sustainability Accounting Standards Board (SASB) materiality map • regulatory guidelines on marketing	2

Syllabus Unit/ Element		Chapter/ Section
3.3	**Fundamental Analysis** On completion, the candidate should:	
3.3.1	Be able to analyse financial data to determine the capital structure of a business: weighted average cost of capital (WACC)	3
3.3.2	Be able to analyse financial data using the following profitability ratios: • return on capital employed (ROCE) • asset turnover	3.3
3.3.3	Be able to analyse financial data to determine: • net profit margin • gross profit margin • equity multiplier • economic value added (EVA)	3.3.3
3.3.4	Be able to analyse financial data using the following liquidity ratios: • working capital (current) ratio • liquidity ratio (acid test) • Z-score analysis	3.4
3.3.5	Be able to analyse financial data to determine: • net present values (NPV) • internal rates of return (IRR)	4.1
3.3.6	Be able to analyse financial data using: • DuPont financial ratio analysis • extended DuPont analysis	3.8
3.3.7	Be able to analyse financial data using the following gearing ratios: • financial gearing • interest cover	3.7
3.3.8	Know the difficulties in using ratio analysis for: • companies in different industries • different companies within the same industry • the same company over successive accounting periods	3.9
3.3.9	Know the characteristics of: • economies of scale • diseconomies of scale	7
3.3.10	Be able to analyse financial data to determine the cash cycle of a company	3.5

Syllabus Unit/ Element		Chapter/ Section
Element 4	**Securities Valuation**	**Chapter 4**
4.1	**Equities** On completion, the candidate should:	
4.1.1	be able to assess the main investment characteristics, behaviours and risks associated with equities	1
4.1.2	Be able to calculate using the following methods for equity valuation: • earnings per share (EPS) • historic and prospective price-earnings ratios (PERs) • dividend yields • dividend cover • price to book	3.5
4.1.3	Understand equity valuations based on dividends: Gordon's growth model	3.5
4.1.4	Be able to analyse financial data to determine: • earnings before interest and tax (EBIT) • earnings before interest, tax, depreciation, and amortisation (EBITDA)	3.5
4.2	**Depositary Receipts** On completion, the candidate should:	
4.2.1	Know the purpose, main investment characteristics, behaviours and risks of depositary receipts: • American depositary receipts • Global depositary receipts • beneficial ownership rights • structure • unsponsored and sponsored programmes • transferability	2
4.3	**Unlisted Investments** On completion, the candidate should:	
4.3.1	Know the main investment characteristics, behaviours and risks associated with: • venture funding • private equity investment	3
4.4	**Corporate Actions** On completion, the candidate should:	
4.4.1	Understand the purpose and structure of corporate actions and their implications for investors: • stock capitalisation or consolidation • stock and cash dividends • rights issues • open offers, offers for subscription and offers for sale • placings	4

Syllabus Unit/ Element		Chapter/ Section
4.4.2	Be able to analyse the theoretical effect on the issuer's share price of the following mandatory and optional corporate actions: • bonus/scrip • consolidation • rights issues	4.2
4.5	**Money Market Securities** On completion, the candidate should:	
4.5.1	Know the main investment characteristics, behaviours and risks associated with money market securities	5
4.6	**Fixed Income** On completion, the candidate should:	
4.6.1	Be able to analyse investment characteristics, behaviours and risks of the following bond classes: • supranational • sovereign government • public authority: local government/ municipalities • short-, medium- and long-dated bonds • dual-dated bonds • undated bonds • floating rate • zero coupon • strips and repos	6
4.6.2	Be able to analyse investment characteristics, behaviours and risks of secured debt: • corporates • financial institutions and special purpose vehicles • fixed and floating charges • debentures • types of asset-backed securities • mortgage-backed securities • securitisation process • roles of participants	6.2
4.6.3	Be able to analyse investment characteristics, behaviours and risks of the following types of unsecured debt: • income bonds • subordinated • high yield • mini bonds • rating	6.3

Syllabus Unit/ Element		Chapter/ Section
4.6.4	Be able to analyse investment characteristics, behaviours and risks of index-linked debt: • retail price index as a measure of inflation • process of index linking • indexing effects on price, interest and redemption • return during a period of zero inflation	6.4
4.6.5	Be able to analyse fixed income securities using the following valuation measures: • flat yield • nominal and real return • gross redemption yield • net redemption yield • yield curve analysis	6.5
4.6.6	Be able to analyse fixed income securities using: • Macaulay duration • modified duration	6.6
4.6.7	know the main bond pricing benchmarks and how they are applied to new bond issues	6.7
4.6.8	Be able to analyse the factors that influence bond pricing: • gross redemption yield • credit rating • impact of interest rates • market liquidity • clean and dirty prices	6.8
4.6.9	Be able to analyse characteristics of the yield curve: • normal • flat • inverted	
4.6.10	Be able to calculate: • simple interest income on corporate debt • conversion premiums on convertible bonds • flat yield • accrued interest (given details of the day count conventions)	6.10
4.7	**Hybrid Investments** On completion, the candidate should:	
4.7.1	Be able to analyse investment characteristics, behaviours and risks associated with convertible bonds	7.1
4.7.2	Know the main investment characteristics, behaviours and risks associated with mezzanine finance	7.2

Syllabus Unit/ Element		Chapter/ Section
4.8	**Derivatives** On completion, the candidate should:	
4.8.1	Know characteristics of: • options • warrants • futures • forwards	8
4.8.2	Understand common value drivers for derivative instruments: • Delta • Gamma • Theta • Vega	8.4.1
4.8.3	Know the characteristics and relevant application of: • historic volatility • implied volatility • the Chicago Board Options Exchange's Volatility Index (VIX)	8.3
4.9	**Swaps** On completion, the candidate should:	
4.9.1	Know the purpose, key characteristics, benefits, costs and valuation of: • interest rate swaps and swaptions • types of swap agreements: vanilla, basis, coupon, index and currency • interest calculations (compared to bond markets) • quality spread differentials • foreign exchange forwards and swaps • equity forwards, swaps and swaptions (volatility, bullet and variance)	9
Element 5	**Collectives and Other Investments**	**Chapter 5**
5.1	**Collective Investments** On completion, the candidate should:	
5.1.1	Know the factors to consider when selecting collective investments: • due diligence • total expense ratios • ongoing charges figure • turnover ratios • assessment of value report	3
5.1.2	Know why closed-ended and open-ended funds may be valued differently	1

Syllabus Unit/ Element		Chapter/ Section
5.2	**Exchange-Traded Products** On completion, the candidate should:	
5.2.1	Know the key features, accessibility, risks, tax treatment, charges, valuation and yield characteristics of the main types of exchange-traded products	1
5.3	**Structured Products** On completion, the candidate should:	
5.3.1	Know the key features, accessibility, risks, valuation and yield characteristics of the main types of retail structured products and investment notes: • structure • income and capital growth • investment risk and return • counterparty risk • expenses • capital protection • tax efficiency	4
5.4	**Ethical, Responsible and Sustainable Investment** On completion, the candidate should:	
5.4.1	Be able to assess investment characteristics associated with ethical, responsible and sustainable investment: • green bonds • blue bonds • impact debt • social bonds • sustainability bonds • carbon • valuation and screening tools specific to ESG investment	5
5.5	**Alternative Investments** On completion, the candidate should:	
5.5.1	Know the main investment characteristics, behaviours and risks associated with alternative investments: • hedge funds (single and fund of funds) • crypto currencies • non-fungible tokens	6
5.6	**Real Estate** On completion, the candidate should:	
5.6.1	Know the main investment characteristics, behaviours and risks associated with property investment	7

Syllabus Unit/ Element		Chapter/ Section
5.6.2	be able to calculate the yield of a property investment	7.2
5.6.3	Know internationally accepted approaches to property valuation: • (RICS) Red Book Global Standards • International Valuation Standards Council (IVSC) International Valuation Standards (IVS) • Association of Real Estate Funds (AREF) guidelines	7.3
5.6.4	Know sustainability measures for real estate investment: Global Real Estate Sustainability Benchmarks (GRESB)	7.4
5.7	**Foreign Exchange** On completion, the candidate should:	
5.7.1	Know the main investment characteristics, behaviours and risks associated with currency investment	8
5.8	**Commodities** On completion, the candidate should:	
5.8.1	Know the main investment characteristics, behaviours and risks associated with commodities	9
5.9	**Infrastructure** On completion, the candidate should:	
5.9.1	Know the main investment characteristics, behaviours and risks associated with infrastructure	10

Element 6	Data Analysis	Chapter 6
6.1	**Sources of Data** On completion, the candidate should:	
6.1.1	Know relevant sources of data: • primary sources • secondary sources • sampling • continuous and discrete • categorical data • frequency and relative frequency distribution • presentation methods	1
6.2	**Statistics** On completion, the candidate should:	
6.2.1	Be able to calculate the measures of central tendency: • arithmetic mean • geometric mean • median • mode	2

Syllabus Unit/ Element		Chapter/ Section
6.2.2	Be able to analyse data to determine the following measures of dispersion: • variance (sample/population) • standard deviation (sample/population) • range • skew • kurtosis	2.3
6.2.3	Be able to analyse the performance of two assets to determine: • correlation • covariance	3
6.2.4	Be able to analyse the relationship of two assets using regression analysis	4
6.3	**Big Data** On completion, the candidate should:	
6.3.1	Know the application of big data in the investment management industry	5
6.3.2	Know the application of artificial intelligence (AI)	5
6.4	**Technical Analysis** On completion, the candidate should:	
6.4.1	Know the basic principles underpinning chart-based analysis • overlays • oscillators	6
6.5	**Measuring Returns** On completion, the candidate should:	
6.5.1	Be able to analyse performance to determine total return	7.1
6.5.2	Be able to analyse performance to determine the money-weighted rate of return (MWRR)	7.2
6.5.3	Be able to analyse performance to determine the time-weighted rate of return (TWRR)	7.3
6.5.4	Understand the types and uses of multi-factor models, their assumptions and limitations	Chapter 1, section 10.4
6.6	**Benchmarking** On completion, the candidate should:	
6.6.1	Be able to assess a range of mainstream and specialist indices in relation to: • composition • weighting • yield • synthetic dividend (where applicable) • smart beta	8
6.6.2	Know the characteristics of a composite (synthetic) benchmark	8.4
6.6.3	Know key aspects of the Global Investment Performance Standards (GIPS)	8.5

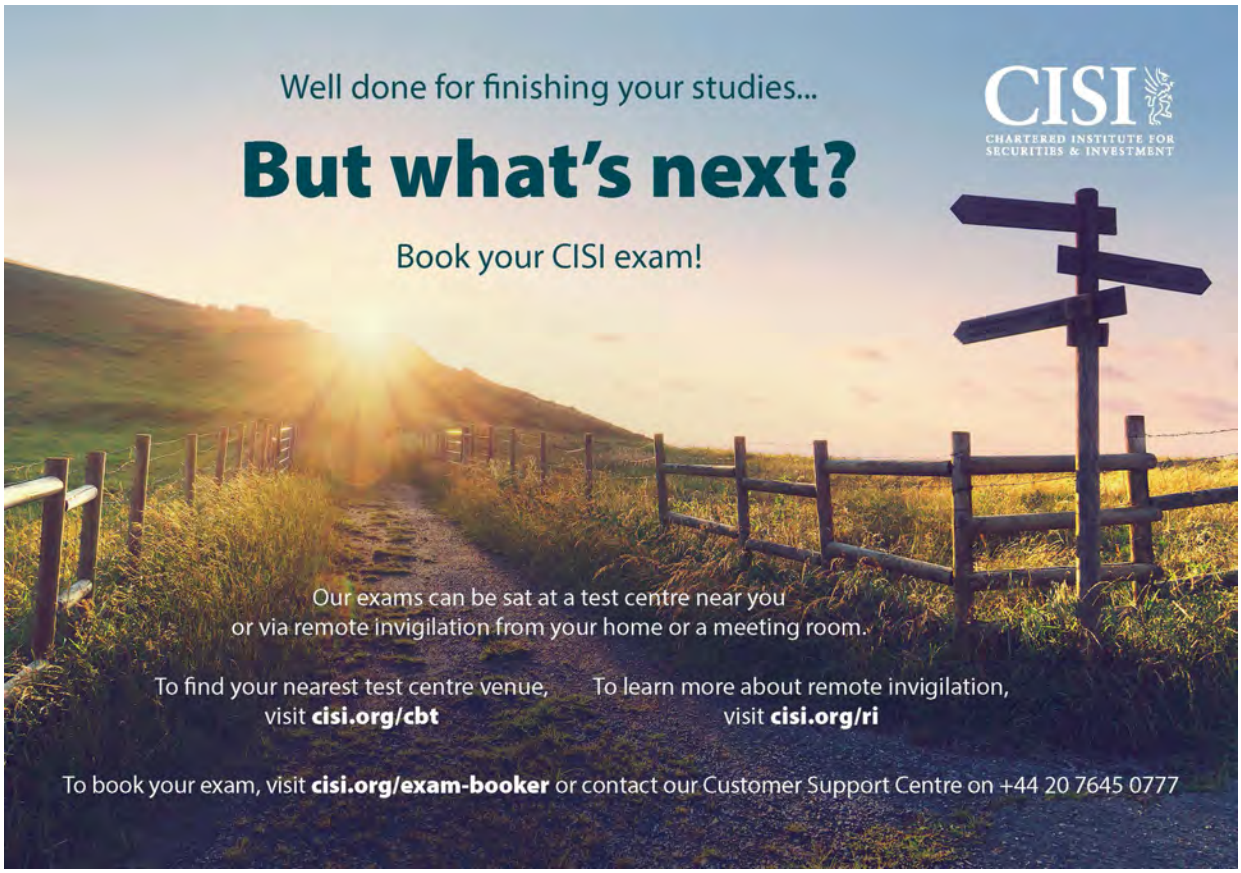
Syllabus Unit/ Element		Chapter/ Section
6.6.4	Be able to calculate the deviations from a performance benchmark attributable to: • actual versus relative performance • asset allocation • stock selection	8.6
6.7	**Risk Adjusted Returns** On completion, the candidate should:	
6.7.1	Know what the following financial metrics are designed to measure: • Sharpe Ratio • Treynor ratio • Jensen measure • Sterling ratio • Calmar ratio • Omega ratio	9
6.7.2	Be able to analyse performance using the Sharpe Ratio	9
6.7.3	Be able to analyse performance using the Treynor ratio	9
6.7.4	Be able to analyse performance using the Jensen measure	9

Examination Specification

Each examination paper is constructed from a specification that determines the weightings that will be given to each element. The specification is given below.

It is important to note that the numbers quoted may vary slightly from examination to examination as there is some flexibility to ensure that each examination has a consistent level of difficulty. However, the number of questions tested in each element should not change by more than plus or minus 2.

Element Number	Element	Questions
1	The Investment Management Industry	11
2	Managing Client Portfolios	11
3	Valuation	14
4	Securities Valuation	21
5	Collectives and Other Investments	10
6	Data analysis	13
Total		**80**



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Understand AML legislation and regulation, the role of the MLRO, and the sanctions and penalties.

Client Assets and Client Money Essentials
Gain an overview of the principles and high-level rules associated with holding and protecting client assets.

Conflicts of Interest
Consider examples of conflicts of interest, tools, policies and procedures, enforcement action, and good practice.

Data Science
Digitisation of business operations has accelerated the speed of data capture. Harness the value of your data.

Diversity and Inclusion
Targeted at those responsible for diversity, equality and anti-discrimination, and those recruiting and managing.

Financial Crime
Gain an overview of insider dealing, market abuse, money laundering, terrorist finance and financial sanctions.

Financial Planning
Gain an overview of the financial planning process, key terms and the regulatory framework that governs it.

Greenwashing
This module explores the key concepts surrounding greenwashing, the wider implications, and the measures being taken to fight it.

Impact Investing
Aim to take ethical and sustainable investment principles a step further through intentional investment.

Integrity and Ethics
Understand ethics in finance, the importance of trust and trustworthiness, and compliance versus ethics.

Market Abuse
Examine offences, penalties, safe harbours, reporting obligations and the relationship with other offences.

Neuroscience at Work
Learn how to work optimally without harming your health when faced with increased workloads and deadlines.

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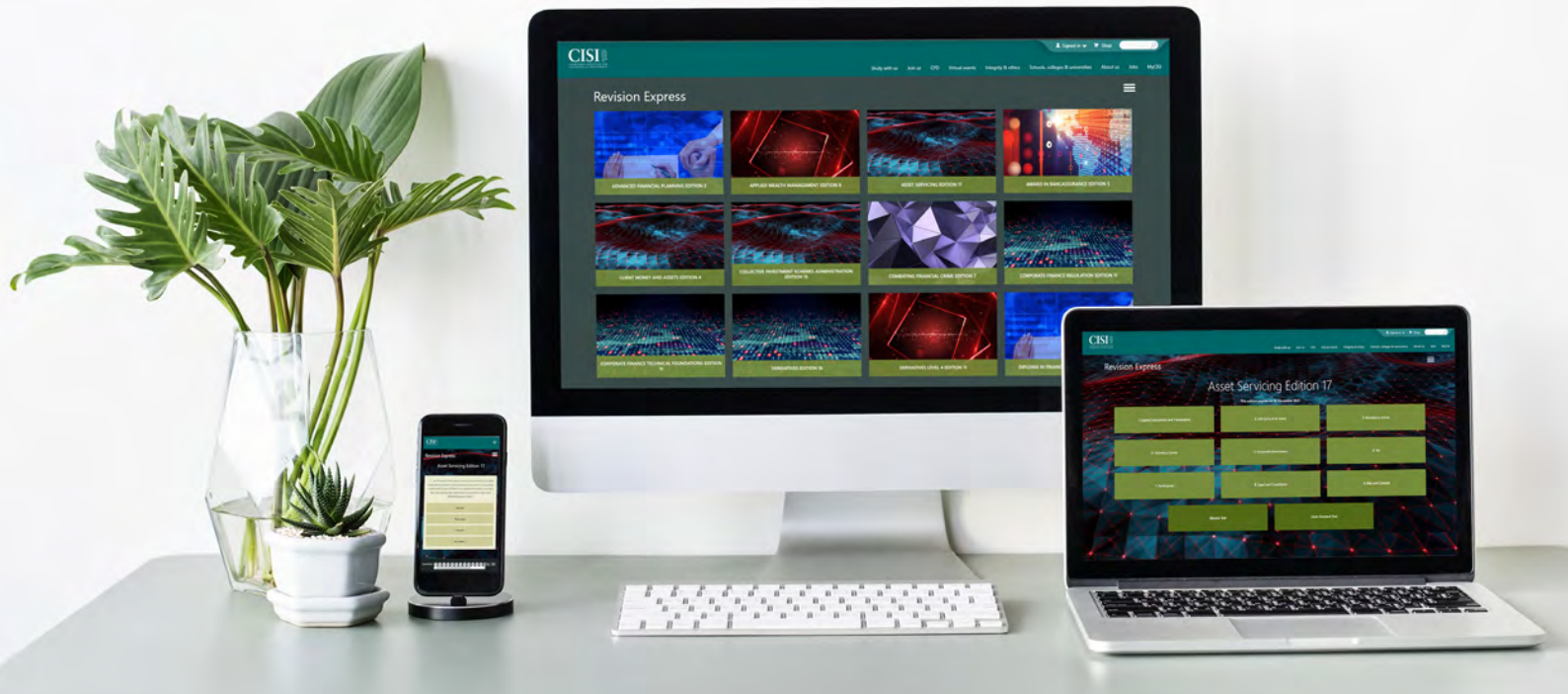

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