CMP Upgrade 2021/22

Subject SA7

CMP Upgrade

This CMP Upgrade lists the changes to the Syllabus objectives, Core Reading and the ActEd material since last year that might realistically affect your chance of success in the exam. It is produced so that you can manually amend your 2021 CMP to make it suitable for study for the 2022 exams. It includes replacement pages and additional pages where appropriate. Alternatively, you can buy a full set of up-to-date Course Notes / CMP at a significantly reduced price if you have previously bought the full-price Course Notes / CMP in this subject. Please see our 2022 *Student Brochure* for more details.

This CMP Upgrade contains:

- all significant changes to the Syllabus objectives and Core Reading.
- additional changes to the ActEd Course Notes and Assignments that will make them suitable for study for the 2022 exams.

1 Changes to the Syllabus objectives

This section contains all the ***non-trivial*** changes to the Syllabus objectives.

The syllabus objectives have not changed materially from 2021 to 2022, however, the following changes have been made:

Some syllabus objectives have been removed, which were included in Chapter 2 and Chapter 3:

2.1.2 Discuss the investment strategies that would be suitable to meet an individual investor's requirements, allowing for their risk appetite, time horizon and other constraints.

2 Changes to the Core Reading

This section contains all the ***non-trivial*** changes to the Core Reading.

Chapter 1

Section 1

The first page of this chapter has been changed to incorporate the accreditation from the IFoA.

Investment is a continually evolving area of financial and actuarial management and this is reflected in this Specialist Applications Subject, SA7, introduced within the 2019 Curriculum. Although the content draws on earlier finance and investment subjects, SA5 and SA6, much of the content is new and will be developed further in subsequent editions.

Accreditation

The Institute and Faculty of Actuaries would like to thank the numerous people who have helped in the development of the material contained in this Core Reading.

Introduction

The Core Reading manual has been produced by the Institute and Faculty of Actuaries. The purpose of the Core Reading is to ensure that tutors, students and examiners understand the requirements of the syllabus for the qualification examinations for Fellowship of the Institute and Faculty of Actuaries.

The examinations require students to demonstrate their understanding of the concepts given in the syllabus and described in the Core Reading; this will be based on the legislation, professional guidance *etc*. which are in force when the Core Reading is published, *ie* on 31 May in the year preceding the examinations. Examiners will have this Core Reading manual when setting the papers. In preparing for examinations students are advised to work through past examination questions and may find additional tuition helpful. The manual will be updated each year to reflect changes in the syllabus and current practice, and in the interest of clarity.

The IFoA has produced a notation sheet suggesting possible standard keyboard notation that candidates could use instead of mathematical notation when typing solutions in Word in the IFoA examinations.

https://www.actuaries.org.uk/system/files/field/document/Exams%20Handbook%20April%202021%20v3.pdf

The United Kingdom left the European Union on 1 January 2021 without an EU-wide arrangement for the operation and regulation of financial services. Discussions will continue during 2021 and this version of the Core Reading does not attempt to address these areas.

At the time of writing (Winter 2021), the effect of the coronavirus pandemic on both the global economy and financial markets will not be known for some time. This version of the Core Reading does not attempt to address these areas.

Chapter 1

Section 5

The first bullet in this list has been expanded and now reads:

- ***Individuals / households*: they usually interact with markets using intermediaries and agents, with a minority engaging and investing more directly. Having said that, there is a trend towards individual investment becoming more important in parts of the world due to a decline in some traditional ways that individuals invest, for example, the decline in defined benefit pension schemes in the UK and elsewhere. This has passed the burden of determining investment strategy and making long-term investment decisions to individuals.**

Also, just at the end of this section, some Core Reading from Chapter 2, section 2.4 has been moved into this chapter. The section reads:

As most investment decisions are made by individuals (whether in service of an institution, for their own account or programming an algorithm), their behaviour may exhibit biases, such as:

- **Inertia – not changing investment portfolios over time despite changes in risk tolerance and other factors.**
- **Taking default options – not customising a portfolio even when an investor's circumstances are non-standard.**
- **Naïve diversification – an individual may simply count the number of portfolio holdings without recognising that several investments may be following a similar strategy/theme or may be offsetting each other.**
- **Investing in the familiar – this may for example result in individuals being happy to hold a large proportion of their investments in their employer company.**
- **Excessive trading – individuals tend to trade too much. Sell winner investments and hang on to losing investments.**
- **Home bias – individuals tend to have a home bias; that is a bias to overweight assets in their home territory.**

Chapter 1

Section 5

The first three bullets of section 6 have been reworded and now read:

The SA7 Core Reading is roughly structured as follows:

- **Section A looks at institutional investors**

  This section includes Chapters 2 (individual investors) and 3 (institutional investors)

- **Section B looks at the investment markets and the corporate finance issues around raising money by companies.**

  This section includes Chapters 4 (asset markets), 5 (derivatives and structured investment products) and 6 (corporate finance)

- **Section C looks at the various influences on markets – firstly the economic, monetary, political and sustainability influences and secondly the regulatory, legislative and taxation influences.**

Chapter 2

This chapter has been materially shortened. The chapter is included as replacement pages at the end of this upgrade note.

Chapter 3

Section 3.5

The first paragraph of section 3.5 has been expanded slightly and now reads:

The Solvency II Directive (2009/138/EC) is a Directive in European Union law that codifies and harmonises EU insurance regulation. It has a material impact on insurance companies operating within the European Union and to an extent those elsewhere, for example where they are part of a European insurance group. A number of countries outside the EU have introduced risk-based solvency regimes that are considered to be broadly compliant with Solvency II, although many of these countries have adapted the regimes to reflect the circumstances of their own market and economic environment. Primarily the directive concerns the amount of capital that EU insurance companies must hold to reduce the risk of insolvency.

Chapter 3

Section 7.4

There have been two additional bullets added to the duties of trustees in this section:

- **policy towards sustainable investment / Environmental Social and Governance matters**
- **ethical stances**

Chapter 4

Section 5.5

A new section on Green Bonds has been added between 'foreign bonds' and 'Eurobonds'. The numbering of sections has been affected after the insertion.

5.5 'Green' bonds

Green bonds are fixed-income securities whose proceeds are specifically earmarked to raise money for climate and environmental projects. Green bond finance projects may for example be aimed at energy efficiency, pollution prevention, sustainable agriculture, fishery and forestry, the protection of aquatic and terrestrial ecosystems, clean transportation, clean water, and sustainable water management.

These bonds are typically asset-linked and backed by the issuing entity's balance sheet, so they usually carry the same credit rating as their issuers' other debt obligations. They may variously be referred to as climate bonds.

A potential concern with 'green' bonds is how to enforce the use-of-proceeds for the advertised environmental projects, as opposed to simply adding the proceeds to the issuer's general balance sheet to be used for whatever purpose comes next.

Chapter 5

Section 10

The graphs and references in this section are regularly updated, and many have been updated for this study session. Replacement pages are included at the end of this upgrade note.

Chapter 7

Section 1

The following bullet has been removed from the list:

- **Roles and responsibilities of directors – Subject SP5**

Also, in section 5, the following note has been added referring to BREXIT:

Note: The United Kingdom left the European Union on 1 January 2021 without an EU-wide arrangement for the operation and regulation of financial services. Discussions will continue during 2021 and this version of the Core Reading does not attempt to address these areas.

Chapter 8

Section 3.1 to 3.3 inclusive

The diagrams have been updated. Replacement pages are included at the end of this upgrade note.

Chapter 9

Section 3

There has been a paragraph added after the list of factors that drive capital and dividend growth. The section now reads:

Factors that drive expectations for capital and dividend growth are:

- **estimates of profits**
- **free cash flow**
- **total enterprise value.**

Additionally these estimates are also driven by the sustainability of the company's business. For example, a business which is considered 'unsustainable' in the longer term (for example, a heavily polluting coal-fired power station) might be penalised with lower future profit estimates compared with a similar, 'cleaner' business.

Also, in section 3.1, the bullet list has been extended to include carbon and sustainable issues, and now reads:

In order to form a view on these factors, a fundamental analyst will investigate:

- **the financial accounts and accounting ratios**
- **dividend and earnings cover**
- **profit variability and growth (by looking at all sources of revenue and expenditure)**
- **the level of borrowing**
- **the level of liquidity**
- **growth in asset values**
- **how well the company is positioned for the transition to a low carbon / sustainable future**
- **comparative figures for other similar companies.**

Chapter 11

Section 4.1

At the end of this section, a new bullet point has been added, and the list now reads:

In relation to 'non-financial factors', The Pensions Regulator's guidance continues to say that 'trustees may take account of non-financial factors, like:

- **any policy regarding the extent to which ESG factors are taken into account in the selection, retention and realisation of investments**
- **if they have good reason to think that scheme members share a particular view, and**
- **their decision does not risk significant financial detriment to the fund'.**

Chapter 11

Section 4.4

Some new material on Engagement and on ESG has been added to the section titled 'thematic'. the revised section now reads:

Engagement

Some practitioners argue that exclusion policies are inherently ineffective at bringing about meaningful change. Eliminating entire sectors because their industries display poor ESG characteristics leaves those companies with little or no incentive to change (in part because the shares may then be bought and held by less scrupulous investors) when in fact change is ultimately necessary to achieve global goals. What could be more important is that investors research diligently the ESG of companies just like they do the business franchise or management and associate discounts to companies that score badly and premiums to better companies. If all institutional investors did this the share price should properly

differentiate a company that is addressing its ESG shortcomings compared with another that is not. Engagement with management can instead help companies understand where they are deficient and start to reverse course – and in so doing, boost their share price.

The three ESG approaches – integration, screening and thematic – can be applied individually or in combination. For example, a strategy might invest in securities that fit certain environmental themes, selecting them from within that universe using fundamental analysis that integrates ESG and financial criteria, and excluding any companies that breach the UN Global Compact principles.

ESG scores

Several firms now provide ESG scores for companies using proprietary measures that look at key ESG issues relevant to an industry and then assess a particular company's exposure to those risks and how well the management is dealing with them. Different assessors often reach different conclusions due to subjective aspects to rating as well as how individual components of an assessment might be combined. It therefore remains important for an investor to do their own research and not fully rely on a single approach from a third party specialist.

Despite the shortcomings, adverse ESG scores will draw unwelcome attention to deficiencies which can be argued is the first step in effecting changes in behaviour.

Towards the end of section 4.5, another new paragraph has been added. The paragraph is included below as well as the paragraph that it precedes:

Engagement can take time. Some fund managers set deadlines for meaningful action among their investee companies. If company management is failing to act appropriately, investors can escalate engagements. This can include using collaboration with other investors (creating more powerful shareholder blocks), for example through the Investor Forum, which is set up to take care that collaborations do not breach regulations against acting in concert. There are other escalation techniques such as public denouncement or taking legal action (which isn't overly common). The ultimate escalation is disinvestment although as indicated earlier, this may surrender the position to a less scrupulous investor who cares less about the ESG impact. However, it may depress the share price which management may wish to avoid.

Voting rights are an important tool for shareholders to hold company management to account. It is therefore good practice for equity investors to exercise their votes as far as practicable, adopting a considered position on each resolution rather than automatically voting in line with management. They may employ a third party to make voting recommendations, which may or may not be tailored to the investor's own voting policy.

Chapter 12

Section 4.5

At the very end of this section and additional paragraph has been added:

Responsible investing team

Investment managers are increasingly establishing responsible investing teams. These may be a dedicated team or integrated as part of the research or portfolio management teams. The objective of the responsible investing team will be to analyse the ESG status and issues of potential investee companies and formulate the manager's response – whether that be avoidance, disinvestment or engagement.

At the very start of section 5, two additional bullets have been added to the list in this section:

- **making clear progress and being able to report to stakeholders on progress made on issues of inclusion and diversity**
- **incorporating, reporting and acting on deficient Responsible Investing / ESG in their portfolios**

3 Changes to the ActEd material

This section contains all the ***non-trivial*** changes to the ActEd text.

There only significant changes to the ActEd text are with reference to the material on historical performance and current economic situation contained in Chapter 9. This has been added as replacement pages at the end of this document.

ActEd Course Notes

Chapter 5

Section 1.4

Some additional text on payoff diagrams and how they could be tested in an online exam environment has been added to this section.

1.4 Payoff diagrams

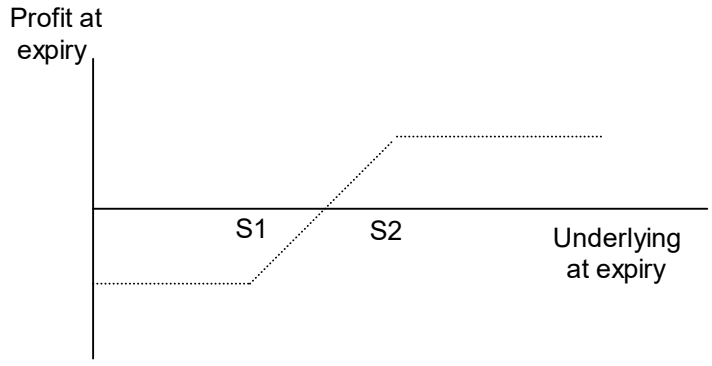
Candidates are expected to be familiar with the derivative payoff diagrams in Subject SP5 (and also covered in Subject SP6, though the latter subject is not required prior knowledge for Subject SA7), for calls, puts and the common combinations of these.

In the past, payoff diagrams have been tested in both Subject SA5 and SA6. Diagrams were relatively simple in the days of paper scripts, but more difficult in online exams. It is still possible for payoff diagrams to be tested in an online environment, and there are also several ways that option payoffs can be tested without the need for a diagram.

One example would be for the examiner to provide a combination of options and ask for the profit at certain points on the X axis. For example, if an investor purchased 2 calls with strike 60, each with a premium of 2, and also purchased one put with the same strike for a premium of 3, what would the profit for the strategy be if the underlying asset expired with a price of 45, and what would it be if it expired with a price of 70?

The solution would be that at a price of 45, the profit would be 12, and at a price of 70 the profit would be 13.

Another way would be for the examiner to present students with a diagram and ask for a combination of options that would produce the payoff. So for example, the following diagram could be produced by buying a call option with strike S1, and selling a call option with strike S2. (There is another way to produce this payoff using puts.)



4 Changes to the X Assignments

Assignment X1

Question X1.1 has been replaced due to the removal of the core reading on individual investment advice. The new question and its solution are as follows:

X1.1 The management of a large commercial bank in a developed country have been reviewing some proposed changes to the regulatory environment, which involves amendments to the risk-weightings used to determine capital ratios, and the introduction of other requirements.

Discuss the rationale behind the following proposed changes, and describe the problems or drawbacks that they may create.

(a) the risk-weighting for AA corporate bonds and loans will be increased by 10%

(b) the risk-weighting for any sovereign claim rated AAA to A will be taken as zero

(c) the introduction of a leverage ratio (which must be less than 3%), defined as:

$$\frac{\textit{Tier 1 capital}}{\textit{total assets (including off balance sheet items)}}$$

(d) the introduction of a minimum amount of 'liquid assets' that the bank must hold at all times.

[15]

Solution

(i) ***Proposed changes***

(a) *Increase to corporate claim weighting*

The capital ratio has the risk-weighted assets on the bottom line, so any increase in the weighting will reduce the capital ratios for banks, bringing them closer to the minimum permitted level. [1]

The reason for the change is likely to be to strengthen the banking system and force banks to hold less risky assets ... [1]

... or to hold more capital protection. [½]

Either the changes reflect the fact that the regulator believes that their previous treatment of AA-rated debt was too generous, or that data now suggests that the risk has increased. [½]

The drawback will be that banks will provide fewer loans to companies in this rating category, depriving the economy of the ability to expand and grow. [1]

It may force companies to look for other ways of raising finance, perhaps directly in the bond market, or using 'shadow banks'. [1]

[Maximum 4]

(b) *Sovereign claims zero weighted*

The rationale will be to encourage banks to hold more 'risk-free' sovereign assets rather than risky corporate loans. [½]

Sovereign claims are often considered to be risk-free because countries can print their currency to enable them to pay any claims, rather than default. [½]

The drawback is that it relies on the regulator being correct that sovereign claims are indeed risk-free. If the regulator is proved to be wrong, banks will be holding the wrong amount of capital for the risk they are exposed to. [1]

Indeed, the change may encourage banks to loan heavily to sovereigns rated 'A', and away from those rated 'AAA' in order to pick up additional yield on the loans. [1]

This will enable these governments to issue more debt very easily as there will be ready buyers. It will penalise governments that have maintained a better rating. [1]

It may also be applied to quasi-government organisations such as the World Bank, the EIB, *etc*. [½]

In general it will encourage governments to issue debt ... [½]

... which may produce a new systemic risk. [½]

[Maximum 4]

(c) *Leverage ratio*

The leverage ratio is a 'backstop' protection that ignores risk-weightings and simply looks at all assets on the bottom line. It is designed to stop banks growing too big relative to the shareholders' capital that they have. [1]

In crises, it has been demonstrated that many historical credit ratings and asset correlations prove to be very inaccurate. [½]

There are economic scenarios where one default can cause the default of many other companies, so that loans are not 'independent' as typically assumed in modelling. [1]

The rationale is to force banks to increase the capital buffer as they grow, even in situations where the risk-weights and the modelling says that they are not taking on too much additional risk. [1]

The drawback of the ratio is that larger banks that invest very safely (for example some building societies that hold mainly home-backed mortgages) will be forced to raise share capital. [1]

This will reduce the shareholders' return on equity, and cause the share price to fall, which may in turn create the risk of a takeover. [1]

It is possible that some banks may move to locations where this ratio is not enforced. [½]

[Maximum 4]

(d) *Minimum liquid assets*

The rationale for this change is to ensure that, if depositors or lenders to a bank demand their deposits back at short notice, the bank is able to raise the cash to pay them. This will avoid a 'run' on the bank. [1]

Banks are exposed to depositors withdrawing funds due to the nature of the activity: borrow short-term and invest longer-term. [1]

A run on one bank can create fear which causes a run on other banks, causing a systemic risk [½]

The problem will be defining what constitutes 'liquid assets'. Many asset categories are very liquid in good times, but in a crisis have no liquidity at all. [1]

An example would be mortgage-backed securities, where the marketability of the securities was very high leading up to the banking crisis, but disappeared completely overnight. [½]

The regulator's selection of such asset categories will be arbitrary or based on past data, but will cause a great deal of demand for those assets, possibly encouraging companies to issue more and more. [1]

[Maximum 4]

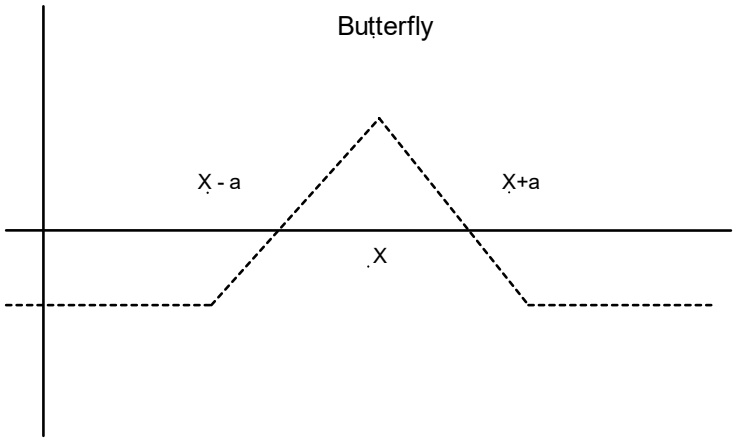
[Overall maximum 15]

Assignment X2

The question and solution to X2.2 (iii) have been changed slightly. The instruction word is 'describe' rather than draw. The marking structure has been changed slightly. The question and solution now read as follows:

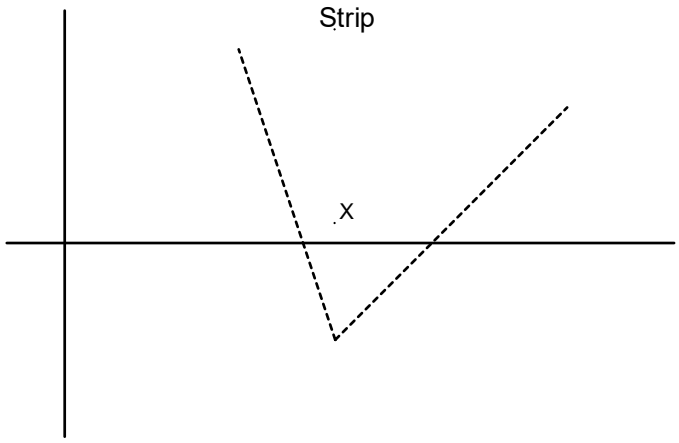
(iii) ***Option strategies***

Strategy 1: This strategy produces a fixed loss when the underlying asset expires either below $X-a$ or above $X+a$. Between these boundaries the option strategy has an intrinsic value which grows to a maximum at X on the x-axis. The overall strategy will be profitable when the profit on the options offsets the cost of the option premiums.



[*This diagram is not required to score full marks*]

Strategy 2: This strategy produces a loss when the underlying expires near to its current price. When the underlying rises significantly, the purchased call makes a profit for the strategy, and when the underlying falls significantly, the two purchased puts generate a profit. The rate of growth of the overall profit is greater when the market is falling due to the fact that there are double the number of puts as there are calls.



[*This diagram is not required to score full marks*]

[2 marks each for description, maximum 4]

Reasons for selecting strategies (strategies do not have to be named)

Strategy 1

This strategy would be appropriate if the manager expected the share price to remain broadly where it is and not fluctuate in either direction. [1]

It may be preferred to other strategies because the losses if the share *does* move by a large margin are limited (*ie* there is no unlimited loss on this strategy). [1]

Strategy 2

This strategy would be appropriate if the manager believed that the market or the share in particular was going to move by a large amount one way or another ... [½]

... and it is superior to other strategies if the manager believes that the chances of the share falling are greater than the chances of it rising. [½]

The manager will also gain if implied volatilities in the option markets rise. [½]

The manager has purchased two options, both of which will rise in price in the short term if volatility (used to price the options) rises. [1]

[Maximum 8]

Question X2.3 parts (ii) and (iii) have been changed. The new questions and solutions are as follows:

(ii) Describe the difference between the following types of buy / sell orders that can be entered into typical trading systems:

(a) market order

(b) limit order

[4]

(iii) Describe the benefits and drawbacks for a trader of entering a trade as 'fill or kill' or as 'immediate or cancel'. [3]

Solution

(ii) ***Market orders and limit orders***

Market order: the trade will be linked with orders that are on the system at the time ... [½]

... and will be executed in full, immediately, at any available prices. [1]

The benefit of this type of order is that it is more or less guaranteed to be completed ... [½]

... whereas the drawback is that it may be partly completed at poor prices. [½]

Limit order: The trade will only transact when it can meet a certain minimum price level (for sellers) or maximum level (for buyers). [1]

This means that the trade may not complete in full or at all depending on the limit set and the orders that exist on the system. [1]

[Total 4]

(iii) ***Validity of the trade, benefits and drawbacks***

Fill or kill – this is an order that has to be transacted immediately *in full*, or is cancelled [1]

Immediate or cancel – this is an order that has to be transacted immediately, *in part or full*, after which any unfilled parts of the order are cancelled. [1]

The main benefit of the former is that the trader will not transact a small meaningless part of the order. This may be useless to the trader and inadvertently announce their intentions to the market. [1]

The main benefit of the latter is that at least some of the trade is likely to go through. [½]

With both order types, the trader is not left with the risk of having the remainder of the deal live on the trading screens for another trader to use at a later date. [1]

[Maximum 3]

Assignment X4

Question X4.1 now refers to 'SONIA' rather than 'LIBOR', but otherwise the question is largely the same. The solution to X4.1 (iii) has been updated to reflect price changes and the pandemic. The solution now reads as follows:

(iii) ***Benefits of a matching asset strategy over previous 10 or so years***

Schemes that have *not* adopted a matching strategy over this period have generally had a higher proportion of assets invested in domestic and overseas equities and property, and would also typically have less invested in gilts and corporate bonds. [1]

In addition the duration of the bonds would typically be shorter than the liabilities. [1]

[The following solution is only an example. Marks should be awarded for solutions that mention the impact of low and falling interest rates on liabilities and on bond assets, the poor and volatile performance of other asset classes, currency issues which may have favoured domestic asset portfolios, and regulation or cost issues that have favoured an LDI approach.]

Bonds

Over the last 10 years (to May 2021), long-term interest rates have remained very low and are close to historical lows. QE is ongoing in many parts of the world and has been expanded due to the pandemic. [1]

Rising bond prices have been bad for those schemes that have not had a matched LDI strategy. [1]

Low and falling long-term rates has been caused by:

- persistently low inflation (despite some small upturns) [½]
- continued demand for longer bonds by life funds and pension funds [½]
  - this has in turn been caused by increased pension regulation causing fiduciary fear (*eg* the PPF in the UK) ... [1]
  - ... and increased (Solvency II) regulation within the life insurance industry, all of which has led to de-risking. [½]
- (most importantly) the central bank's policy of QE, which involves buying gilts. [1]

Equities

Over the last 10 or more years (May 2021), the return on equities has mediocre. Funds that have had higher weightings in equities have not seen a benefit. [1]

This has been caused by a number of events, including the crash following the corona virus outbreak, which caused businesses to close, and equity prices to fall sharply. [1]

Lockdowns have been extended for more than a year in most countries. [½]

It has also been caused by the threat of trade wars and continuing global political tensions, ... [½]

... as well as the uncertainty caused by the European government debt crisis during the period 2010 to 2013. [½]

[Markers give marks for any other negative influence on equities, such as BREXIT fears, oil price collapse, regulations.]

Property

The performance of commercial property has been bad during the period (as at May 2021) worsened considerably by the impact of the pandemic. [1]

Many businesses will close as a result of the pandemic, meaning that properties will become vacant, and rents and taxes will not be paid. [1]

However, most institutions that are not pursuing an LDI approach have not had a very high exposure to this asset class. [½]

[Markers give appropriate marks for other reasons, maximum 7]

Assignment X6

The last question X6.3 in this Assignment has been rewritten. Replacement pages are included at the end of this upgrade document.

5 Other tuition services

In addition to the CMP you might find the following services helpful with your study.

5.1 Study material

We also offer the following study material in Subject SA7:

- Flashcards
- Mock Exam and AMP (Additional Mock Pack).

For further details on ActEd's study materials, please refer to the 2022 *Student Brochure*, which is available from the ActEd website at **www.ActEd.co.uk**.

5.2 Tutorials

We offer the following (face-to-face and/or online) tutorials in Subject SA7:

- a set of Regular Tutorials (lasting three full days)
- a Block Tutorial (lasting three full days)
- an Online Classroom.

For further details on ActEd's tutorials, please refer to our latest *Tuition Bulletin*, which is available from the ActEd website at **www.ActEd.co.uk**.

5.3 Marking

You can have your attempts at any of our assignments or mock exams marked by ActEd. When marking your scripts, we aim to provide specific advice to improve your chances of success in the exam and to return your scripts as quickly as possible.

For further details on ActEd's marking services, please refer to the 2022 *Student Brochure*, which is available from the ActEd website at **www.ActEd.co.uk**.

5.4 Feedback on the study material

ActEd is always pleased to get feedback from students about any aspect of our study programmes. Please let us know if you have any specific comments (*eg* about certain sections of the notes or particular questions) or general suggestions about how we can improve the study material. We will incorporate as many of your suggestions as we can when we update the course material each year.

If you have any comments on this course please send them by email to **SA7@BPP.com**.

2

Individual investors

Syllabus objectives

2.1 Discuss the principles and objectives of investment management, along with the main factors influencing investment strategy, and analyse the investment needs of an investor.

3.3 Describe the impact of technology on investment management, including:

- trading in derivative, equity and bond markets
- product development.

0 Introduction

Determining investment strategies for individuals, or providing advice to individuals regarding investments, is beyond the scope of this subject. Nevertheless, a working knowledge of the main investment products bought by individuals, and the reasons behind these, is necessary in order to put the institutional products into context given that individuals are very often the customers or beneficiaries of the products offered by institutions.

As referred to in Chapter 1, there is a trend towards individual investment becoming more important in parts of the world due to a decline in some traditional ways that individuals invest, for example, the decline in defined benefit pension schemes in the UK and elsewhere. This has passed the burden of determining investment strategy and making long-term investment decisions to individuals.

Another important trend influencing how individuals invest is the significant increase in the regulation of individual investments and the advice given to individual investors over the last decade. The issues of regulation of individual investments and investment strategy will be further developed in later chapters.

Brief review of material from earlier subjects

This chapter draws on material covered in Subjects SP5 and CP1 in particular.

1 Investment vehicles for individual investors

1.1 Pension schemes

Many countries offer tax advantages to individuals when they allocate money into a pension scheme. This makes them one of the best forms of investment for individuals.

Typically, some or all of these apply:

(i) Contributions are granted tax relief at the investor's marginal rate (often up to a maximum contribution).

(ii) There is no tax on income or capital gains within the fund.

(iii) Part of the fund may be taken as a tax free lump sum on retirement; and

(iv) Life insurance can be provided from contributions to the fund.

Pensions paid out from the fund once the member retires are typically taxed as earned income.

There are several versions of pension funds:

Occupational pension schemes

These are set up and overseen by an employer, and if they are defined contribution schemes, members typically have control over the choice of underlying investments, often from a 'menu' of funds pre-selected by the employer or the financial institution managing the scheme.

Personal pension schemes

Personal pension schemes are typically run through insurance companies or stockbrokers. The plans are always of the defined contribution type. There are different names for such schemes, *eg* in the UK a self-invested personal pension offers the policyholder the facility to become their own fund manager, selecting exactly what investments they want in their personal pension fund. In the USA, similar vehicles are referred to as 401(k) plans. The investment choice and flexibility are an additional attraction for investment-aware policyholders.

Individuals who are in occupational pension schemes can sometimes have the option to invest additional amounts in such schemes to gain additional benefits.

1.2 Life insurance policies

Many investment products are available from life insurance companies, *eg* unit-linked investment funds and endowment policies. Endowment policies can be non-profit, with-profit and unitised with-profit, and involve long-term regular savings that are invested with an appropriate level of risk over a long period of time. Reversionary bonuses and terminal bonuses are determined from time to time by the insurance company, and a 'market value reduction' factor may apply to early redemptions by policyholders during times of poor asset performance.

Determining the 'appropriate' level of risk can be difficult for an insurance company, and may not even be known by the retail investor. There is a general understanding that an investor who invests in a non-profit policy feels that they are accepting less risk than a similar investor who invests in a with-profit policy. If returns are good over the period of the endowment policy, the with-profits policyholder would expect to gain a higher return. If returns are bad, then the non-profit policyholder might expect to get the higher return and expect that the with-profit investor experiences the downside risk that was accepted at the start. Whether this ends up being the case may depend on the courts, and on the attitude of the regulator towards the advice that the with-profits investor received at the start.

Reversionary and terminal bonuses are discussed in earlier subjects.

Although popular in the past, partly because of an aspect of tax efficiency that was removed over time (in the UK)**, sales of traditional with-profit endowment policies have declined over the years.**

With changes in regulation, asset managers are increasingly winning market share for individual investment products from life insurance companies, particularly in the post-retirement market.

This means that asset managers that offer products directly to the public, such as investment trusts, unit trusts, OEICs and ETFs, have found that investors are increasingly willing to invest directly in these products and avoid the 'middle man' of the life company. Clearly with such collective investment schemes, there is no smoothing, and the investor accepts the full risk of the underlying investment.

1.3 Tax efficient investment vehicles

Most countries have political policies aimed at encouraging their citizens to save more. They generally result in the creation of tax-efficient investment vehicles aimed at individual investors.

Strangely, most Western countries also have interest rate policies that encourage citizens to save less and to borrow more!

Sometimes investment products are launched which exploit a tax loophole, or where the government makes tax benefits available for investment into certain industries or small companies. The resulting products are usually aimed at the wealthier investor and can have a very short lifespan before the loophole is closed or the incentive is removed.

Of course the term 'loophole' is never as clear as it may seem. A product may be designed to use a perfectly legal aspect of the tax system, but perhaps the design uses this aspect more aggressively than the tax authorities expected. As more and more products adjust their design to take advantage of the structure, the issue becomes more and more visible to the tax authorities, until eventually they act to try to block further products in this area. The issues are often about shades of grey rather than black and white. The tax authorities are also not inclined to act too frequently as it can add complication to an already extremely complicated tax framework.

1.4 Investment trusts (ITs)

These are covered in Subject CP1 and Subject CB1.

ITs are closed-ended vehicles that normally trade on a stock exchange. They are legally structured as companies, have a board of directors and shareholders, and can borrow as well as raise share capital. They typically pay corporation tax which can be a major disincentive for some investors (such as pension schemes) that would not normally be subject to tax.

For certain types of underlying asset, the tax problem can be more of an issue than others. If an IT invests in equity shares for example, as a corporate entity, it would not pay further tax on any dividends received from its investments. This may be the same as the tax paid by the investor (or pension scheme) on dividends received from direct equity investments. Indeed, the tax paid by the IT may even be less than the tax paid by higher-rate taxpayers. On the other hand, an IT would pay corporation tax on rental income received, whereas a pension fund would not expect to pay tax on rents.

In order to reduce the tax impact, which was particularly problematic in the property sector, a form of IT called a real estate investment trust (REIT) was designed. These must invest in real estate and must distribute a large proportion (say 90%) of any rents received from the property portfolio. Such distributions are then taxed as earnings in the hands of the shareholders, so the tax is not avoided in normal cases. However, for pension funds that pay no tax on earnings, the corporation tax is avoided, which makes the REIT structure more popular than the IT structure for pension funds.

There are various similar products in other parts of the world. The introduction of REITs in the UK was heavily influenced by the availability of similar tax-free products popping up around the globe, and the desire of UK authorities to prevent institutions from having to invest their funds via overseas products in order to avoid tax.

1.5 Exchange-traded funds (ETFs)

An ETF is an investment vehicle which trades like a stock but contains a portfolio of securities which tracks a specified market index. ETFs are structured as open-ended trusts and trade on a stock exchange. Unlike investment trusts, new shares can be created or surplus shares destroyed relatively easily, and some market participants are given the ability to arbitrage between the ETF shares and the constituents of the index it aims to track. This has the effect of limiting the potential deviation between the ETF's share price and its net asset value, making them much better at tracking the index than their traditional investment trust counterparts.

Investment trusts, unit trusts and ETFs have been covered in reasonable detail in earlier subjects. It is expected in Subject SA7 that you understand the structure of these vehicles.

Tracking error is still an issue and may be caused by:

- **expenses within the fund, including administration charges and transaction fees**
- **withholding taxes that cannot be reclaimed on overseas securities.**

ETFs normally get exposure to the underlying index or benchmark by one of two routes:

- **directly investing in the underlying assets (possibly using a sampling technique if the index has many constituents)**
- **through derivatives such as futures and swaps.**

Risks that ETF managers are exposed to include:

- ***Credit risk***

  This is particularly important where the ETF has derivative exposure and may have counterparty exposure through this.

  For example, if the ETF is counterparty to a swap arrangement or has bought an over-the-counter option.

  It can also be important if the ETF operates large collateral or margin accounts which may be invested with particular bank counterparties.

  Collateral is often held as cash with a counterparty. If that counterparty defaults, the collateral may be at risk.

  Where futures exposure is obtained through derivatives exchanges, there may be significant exposure to the clearing houses involved, even though the risk of default may be low.

  In addition, many ETFs undertake significant volumes of stock lending to generate additional fees. Although collateral is normally required, there will be additional credit exposure to the stock borrower.

- ***Liquidity risk***

  Some ETFs are permitted to borrow in order to fund margin calls. If this borrowing is withdrawn the ETF may have to find the cash at short notice; liquidity risk also exists (particularly for ETFs investing in illiquid assets) if investors redeem units and the manager is unable to sell underlying assets quickly to satisfy these redemption requests. Such risks also arise for stock lending.

- ***Regulatory risk***

  Changes to the rules governing what investments may be held, reporting requirements *etc* can be a risk for the manager.

- ***Tax changes*, including withholding taxes overseas, also represent a risk.**

Question

Why does stock lending create additional credit risk for the investor?

Solution

Stock lending is where an investor (normally an institutional investor, as this is quite a sophisticated and complex process) that holds a portfolio of shares or other assets, allows their custodian to 'lend' those shares to other investors for a fee. The other investors are typically market makers or hedge funds who would like to take short positions in the share, but need to borrow the shares in order to settle their short sale. They borrow the shares for a period, perhaps 7 days, or a month, and pay a fee based on the value of the shares borrowed. Any dividends paid by the share during the borrowing period need to be paid to the owner of the share. Likewise, some collateral is usually required. But if the borrower goes bankrupt during the borrowing period, the stock lender would have to use the collateral to replace the shares borrowed. In some cases the collateral may not cover the costs of this, and a credit loss would be incurred by the ETF, and therefore by the investor.

Question

What are withholding taxes, and why are they a problem for investors?

Solution

Many governments insist that a tax is deducted at source from income paid to investors. In some cases these taxes can be very high; for example withholding taxes on dividends in some countries can be as high as 45% of the dividend paid. Investors who are not liable to pay additional tax on the income, for example pension schemes, can usually reclaim the tax. But reclaiming can be complicated and involve forms that have to be completed in various languages and submitted to various tax authorities around the world. Many investors are unable to reclaim the taxes even if they are not due to pay them.

The justification for the taxes is that some investors do not declare assets or income to their own tax authorities. If assets are not declared, and are 'hidden', then the investor cannot reclaim the tax without disclosing the existence of the assets. Withholding taxes are seen as a measure against tax avoidance and money laundering. For many investors though, they can represent a costly additional tax that either takes a lot of time and effort to reclaim, or simply has to be written off as an additional cost.

One reason for the emergence of the Eurobond market, was to allow companies the possibility of issuing bonds directly to investors, without going through the official stock market channel. This was to avoid withholding taxes raised on income paid by stock market listed bonds.

Risks faced by investors in ETFs

Most of the risks listed above would represent a risk indirectly to investors in ETFs. However, in addition, investors are exposed to:

- ***Tracking error* − where the share price and the benchmark do not track efficiently**
- ***Marketability risk* − where the investor is unable to sell the shares when sales are needed, or perhaps only able to sell the shares at a significant discount.**

ETFs come in many forms:

- **Index ETFs**
- **Commodity ETFs**
- **Bond ETFs**
- **Currency ETFs (also known as ETCs)**
- **Active ETFs**
- **Leveraged ETFs.**

Within these categories, the choice of funds is often overwhelmingly large. For example, if an investor wishes to gain exposure to real estate, there may be ETFs by country, global, leveraged, based on mortgages rather than direct property, and even inverse ETFs for those that wish to back falling real estate prices.

Much of this material should be familiar from earlier subjects.

1.6 Investments more suited to high net-worth individuals

Structured products

These products come in many shapes and sizes but are basically a traditional fixed interest security (often a zero-coupon bond) with special features providing a payout if certain market performance is realised. Each has a particular risk-return profile and is designed to give specific returns depending on the movement of some underlying security or index. They often have a 'return of original investment' feature that may be subject to certain events not having occurred, such as the underlying index not falling below a certain level. Derivatives form a key component of the product. Structured products are covered in greater depth in Chapter 5.

An example would be a guaranteed equity product which provides exposure to the equity market and provides downside protection. A typical example of such a product could be a five-year bond that provides a payout linked to the capital growth in the FTSE 100 index. If the index exceeds 125% of its starting value at any time during the five years, that amount of growth is locked in. Furthermore, there may be a money back guarantee, should the index fall over the five years.

Contracts for Difference (CfD) and financial spread betting

A CfD, or Contract for Difference, is an agreement between two parties to exchange the difference between the opening price and closing price of a contract. CfDs are similar to financial spread betting and are a type of derivative product typically traded online that allow an individual to trade on live market price movements without actually owning the underlying instrument on which the contract is based. The difference between a CfD and a financial spread bet may be limited to differing tax treatment of gains or losses.

CfDs can be used to speculate on the future movement of market prices regardless of whether the underlying markets are rising or falling. An individual can go short (sell), allowing the individual to profit from falling prices, or hedge their portfolio to offset any potential loss in the value of their physical investments.

Again, CfDs were introduced in earlier subjects, and the information is important for Subject SA7. Most of the main concepts are, however, repeated here.

It can be more cost efficient to trade CfDs than to trade in the underlying security due to lower transaction costs and they can provide cheap leverage. The provider also typically provides free access to the trading platform and sometimes offers free additional research and technical analysis services.

Question

Why do CfDs offer cheap leverage?

Solution

Because they operate in a similar way to a futures contract, an investor can get significant exposure to an asset by placing only a smaller amount of collateral with a broker. This achieves the same effect as if the investor had borrowed cash from a bank to invest more heavily in the chosen asset, which is 'leverage' or gearing.

The nature of CfDs means that such products are only appropriate for disciplined investors and those with high net-worth and high risk tolerance. However, most individuals using them do not typically fall into these categories (often it is inexperienced, smaller traders) which results in many of them losing money. The UK financial regulator found that 82% of such investors end up losing money with an average loss of over £2,000.

CfDs are illegal in the USA as the SEC considered them too risky for individual investors (and also because they are considered a form of online gambling, which is illegal in many states). They are even considered *riskier* than gambling by the Australian financial regulator!

CfDs are discussed further in Chapter 5.

Mis-selling is a significant risk for this industry.

1.7 Packaged Retail Investment and Insurance Based Products (PRIIPS)

PRIIPs refer to a broad category of financial investment covering all packaged, publicly marketed investment and financial products that have a relation to investment assets, that aim to provide a return over time and have an element of risk, that are sold by banks, insurance companies or other financial institutions in the European Union (EU). They do not include direct investments, such as buying a specific share of a company.

The European Commission created the PRIIPs category for the purpose of regulation. The regulations came into effect as of 1 January 2018 and set out new calculation methodologies and transparency requirements for PRIIPs, including what key information documents (KID) (including performance figures) need to be prepared by entities offering PRIIPs within the EU. The aim of PRIIPS is to help investors better understand and compare the key features, rewards and costs of different PRIIPs.

2 Aggregating retail investors

Most retail investors buy investment products through intermediaries such as banks, financial advisers or tied agents, and more recently, via online platforms and fund supermarkets. Investment advice is usually given to retail investors in the form of best-buy lists of investment managers, and is increasingly being conducted over internet-based platforms. The use of these platforms has seen substantial growth in recent years.

In the UK, over three million retail investors use platforms to hold assets or invest. 'Platforms' are websites, used by intermediaries and consumers, which allow retail investors to buy a range of funds from different asset managers and hold them together in one account. As well as providing facilities for investments to be bought and sold, platforms are often used to aggregate funds and also arrange custody for customers' assets.

Advice to retail investors is often based on research by independent investment research companies (such as MoneyMate or Morningstar).

2.1 Robo-advisers

The growth in data analytics and the technological developments that have led to algorithmic trading has also impacted the investment advice industry. Robo-advisors are a comparable evolution to that of the move from electronic trading to algorithmic trading. The logical and rational elements of the investment advice process are increasingly being automated – for example some of the questions previously asked by an advisor can be more efficiently asked, compiled and processed by a computer programme, *ie* a robo-advisor. The role of the professional investment advisor then becomes increasingly related to the thought and creativity that they can use to design their robo-advice service.

With increasing growth of big data, the evolution of this form of advising is likely to continue to develop and grow at a rapid pace. It is likely to lead to changes in the competitive dynamics in the investment advice industry as the players compete to gain a competitive edge with their robo-advice offerings.

Determining the power of the investment narratives behind these robo-advisors is also a new area for supervision by investment regulators.

The chapter summary starts on the next page so that you can keep all the chapter summaries together for revision purposes.

Chapter 2 Summary

Pension savings

The tax advantages of saving into a pension wrapper are:

- contributions are granted tax relief at the investor's marginal rate (often up to a maximum contribution)
- there is no tax on income or capital gains within the fund
- part of the fund may be taken as a tax-free lump sum on retirement
- life insurance can be provided from contributions to the fund.

Pension schemes can be categorised as either occupational schemes or personal pension schemes.

Other savings vehicles

Many countries have tax-efficient savings schemes which are legal and encouraged. Investment trusts and unit trusts are popular and covered in earlier courses.

Structured products exist for individual investors that often guarantee a certain minimum return with a potential upside linked to an investment index.

Contracts for difference can be used by individuals to gain exposure to markets.

Exchange traded funds

ETFs are gaining in popularity. The important features of these are:

- they are usually tracker funds (although active exist too), tracking an index, subject to expenses, charges and withholding taxes that cannot be recovered from overseas
- they invest either directly in the underlying securities or indirectly through derivative instruments
- they expose the investor to credit risk either on the underlying investments or through derivative instruments, collateral accounts or stock lending
- liquidity risk may be an issue if the underlying instruments are not marketable
- regulatory risk and tax risks are present.

Due to the complexities and risks of giving investment advice to individuals, robo-advisors are gaining in popularity. The investment professional will design the application rather than advise the individual.

This page has been left blank so that you can
keep all the chapter summaries together for revision purposes.

Chapter 2 Practice Questions

2.1 A friend is considering whether they should invest their savings in a selection of unit trusts, or to join their company's money purchase pension scheme (which does not benefit from employer contributions) and build up savings in this way. Without considering the regulatory implications of providing investment advice, describe the advantages and disadvantages of both approaches and explain the considerations that they should make before reaching a decision. [10]

Exam style

2.2 You have recently moved from being a fund manager with a large life assurance company to a private bank where you will be responsible for advising clients on their investment needs and recommending suitable portfolios.

Discuss the major differences between the needs of a life insurance office and those of a private client's investment portfolio. [8]

2.3 A major institutional investment company ABC has invested a considerable amount of resources in recent years to introduce a new algorithmic trading system to their dealing desk. For some time the ABC senior management team had noted that the company was finding it increasingly difficult to execute the larger deals that they wanted to undertake.

Exam style

Explain the potential benefits for ABC once the algorithmic trading system is implemented, and describe the ways that they might quantify the benefits that have been achieved. [10]

The solutions start on the next page so that you can separate the questions and solutions.

Chapter 2 Solutions

2.1 ***Investing via a pension arrangement***

The advantages of this approach would be:

- Contributions are often granted tax relief at the investor's marginal rate in many countries.
- The only tax on investment income is in respect of equity dividends, where tax deducted at source cannot be reclaimed.
- There is usually no tax on capital gains within the fund.
- Part of the fund may often be taken as a tax-free lump sum on retirement.
- Life assurance can be provided from contributions to the fund. [2]

As disadvantages, we should note that:

- Pensions paid from the fund are normally taxed as earned income.
- There are contribution limits (but these are normally relatively high, both on an annual level of contributions and on a 'lifetime fund' level).
- Pension funds cannot reclaim corporation tax paid by the company on its profits before dividend income is paid.
- Once invested, it is not possible to access the investment until retirement.
- The scheme usually offers a restricted range of funds to choose from.
- The scheme may not be able to reclaim certain overseas withholding taxes that are levied on income. [2]

Saving via unit trusts

The benefits would be as follows:

- The full capital can be withdrawn at any time.
- When used to buy an annuity, part of the annuity is considered return of capital and therefore receives favourable tax treatment.
- There is a great deal of flexibility on how to invest the capital, and most companies offer a large range of unit trusts to suit all investor needs.
- There are no limits to how much can be invested and when. [2]

Disadvantages of a unit trust approach would be:

- Income from unit trusts would be potentially taxable, as would capital gains crystallised (subject to the annual personal allowance)
- No relief is given in respect of contributions – *ie* investments are made out of net earnings [2]

In summary, the most important advantage of investing via a pension is that tax is not paid within the fund (other than tax credit mentioned earlier) and tax relief is given on contributions when they are made. This advantage has to be weighed up against the tax implications when the pension is paid when all income is subject to tax (other than the lump sum). [1]

The choice will depend on the investor's age and expected long-term investment return. [1]

Other considerations such as access to capital may be important in certain circumstances. [1]
[Maximum 10]

2.2 ***Investment needs of a life insurance office and a private bank***

The differences can be summarised in four major headings:

Liabilities

The liabilities of a life insurance company will to a large extent dictate the portfolio of investments it can hold. The liabilities are long-term and contain a mixture of nominal and real commitments. As such the portfolio will be constructed on this basis. [1]

Private client money is often spare cash from a wealthy individual, and as such will not have any obvious liabilities to fund. The most important features for such portfolios will be risk and return. [1]

Statutory

Life insurance companies have minimum statutory requirements that must be met under Solvency II. Assets are valued at market value, and liabilities are discounted to the present day using a 'risk adjusted' discount rate. Life companies must show that their Solvency II position shows sufficient capital above the Solvency Capital Requirement (SCR) to satisfy the regulator. [2]

In addition, certain assets are inadmissible for this calculation – a life insurance company will damage its solvency if it invests heavily in such securities. [1]

Similarly large concentrations of investments and exposures cause solvency issues and may require special treatment and disclosure under Solvency II. [1]

Private client portfolios on the other hand are not restricted in this way which leaves them much freer to invest in risky and unquoted securities and to have large concentrations of particular assets in pursuit of higher returns. [1]

Risk

Life insurance companies aim to meet their specific liabilities and to give a return to with-profit policyholders that meets their reasonable expectations. The policyholders do not expect large amounts of risk in their portfolio. [1]

On the other hand, clients who invest excess cash with a private client bank can generally accept relatively high levels of risk on their investments. [½]

Return

The return achieved by a life insurance company must be sufficiently high to meet its fixed liabilities. Beyond that there is no need to achieve particularly strong investment returns in order to win new business. [1]

Also the sheer size of life insurance company funds means that they are almost certain to achieve average returns in each asset category – *ie* they will be close to being passive investors. [1]

Private client money is more flexible and it is easier to alter portfolio structure at short notice. [½]

The investors are primarily interested in the level of the return on their investment, and as such returns are the most important aspect of this type of portfolio. [1]

[Maximum 8]

2.3 ***Benefits of an algorithmic trading system and ways to quantify those benefits***

Potential benefits

A good system will use market information to determine where and when the trades should be placed, and will enable ABC to improve the prices that it achieves.

This may be particularly advantageous for larger deals where ABC will find that it pushes market prices when trades are executed.

Poor deal execution is another cost for a fund manager which will hold back performance and potentially push relative performance into the bottom quartile. This has a reputational cost.

If other institutions have implemented algorithmic systems, they will be 'gaming' the trades that ABC places on the system, using the market information that ABC is disclosing.

A good system can conceal this market information and prevent ABC competitors from gaining an advantage. It may also allow ABC to hold on to its better staff who may be growing restless if the performance has been poor.

Quantifying the benefits

ABC could notionally run a portfolio for a period of time that trades at the observed market prices, and compare it with a real portfolio that uses the algorithmic system. The difference between the performances is referred to as the 'implementation shortfall'.

Such shortfalls can be used to tweak the algorithm and improve the system after its implementation. This will need to be done on an ongoing basis or the algorithm will cease to have a competitive benefit.

The speed of the system will also have to be reviewed on an ongoing basis as the technology of ABC's competitors improves over time. Speed of execution is critical for a system's efficiency.

If a competitor's system can detect ABC's trades being entered on the system and trade before ABC's deals are executed, the algorithmic trading system will become useless. Indeed it may become a liability.

It may also be possible to 'back-test' the system using historical share price information. This will determine how the system would have performed in the past and quantify the implementation shortfall over different historical periods.

10 Historical performance of asset markets

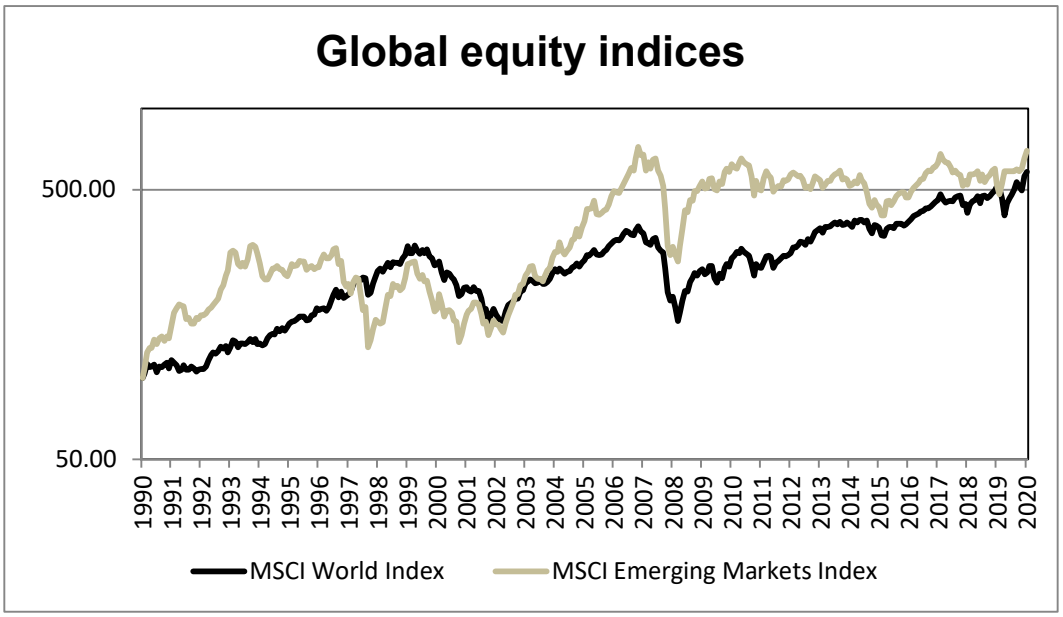
The following section is quite long and looks at the historical performance of various asset classes. It is more important to know the general shape of the historical performances, and the reasons for the trends and any sharp movements, rather than know the exact returns over historical periods.

At the time of writing (Winter 2021), the effect of the coronavirus pandemic on both the global economy and financial markets will not be known for some time. This version of the Core Reading does not attempt to address these areas.

The following charts illustrate the historical behaviour of various main market indices and indicators.

10.1 Equity markets

Global equity markets



Source: MSCI: IFoA calculations

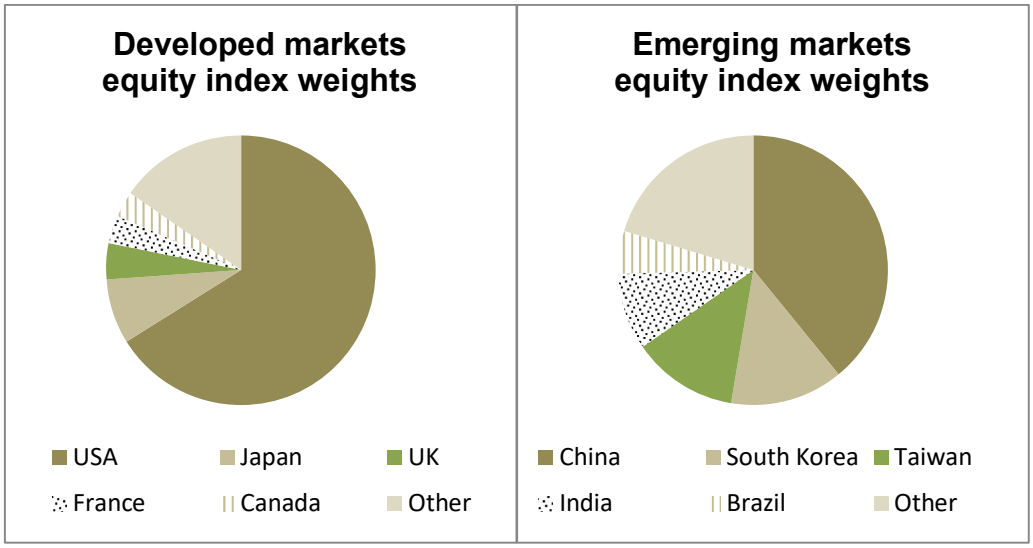
The World index is the one that is less volatile in the picture.

Performance of the MSCI World Index, a widely used index for global developed market equities, and the MSCI Emerging Markets Index, both rebased and shown from Dec 1990 – Dec 2020.

The MSCI World index actually measures both developed and emerging markets together, however the large relative size of the developed markets means that in practice the performance tracks developed markets.

The World Index is dominated by developed markets, notably the USA. Note how performance is positive overall, but with significant negative periods corresponding (in the case of World Index):

- **to the 'dot.com' bubble bursting in 2000-2001**
- **to the 2008-2009 financial crisis**
- **(in the case of the Emerging Markets Index) additionally to the Russian and emerging markets debt crisis of 1997-1998.**



Source: MSCI; As at 31 December 2020

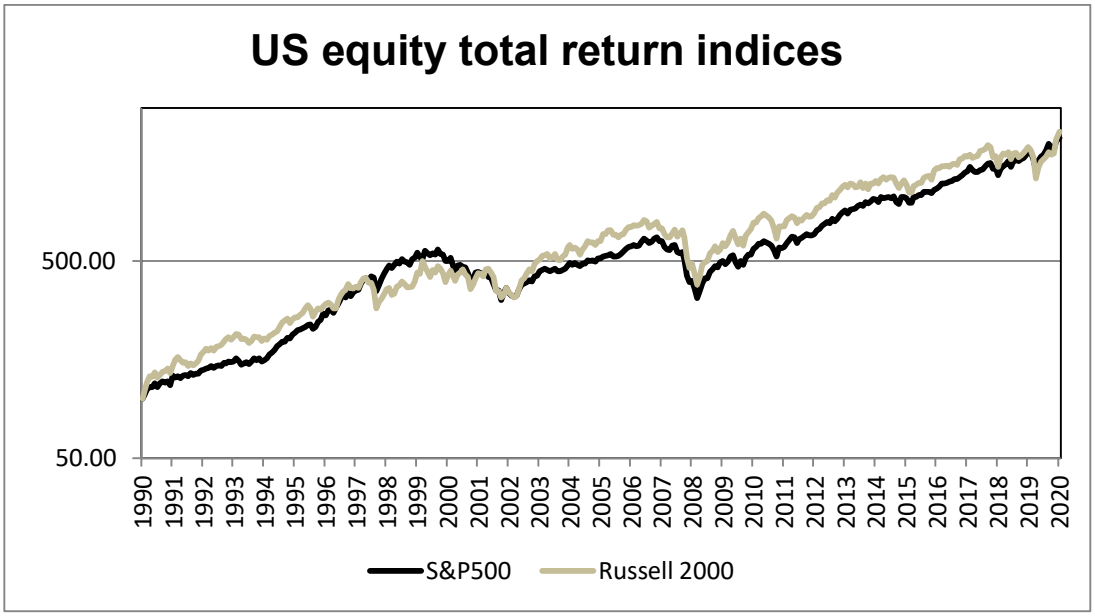
If the colour categories cannot be easily seen in black and white, the segments begin at 12 o'clock and work clockwise (*eg* in the first graph USA is the largest, then clockwise Japan, UK, France, ...)

The USA is the world's largest equity market, representing over half of global market capitalisation. In emerging markets, China has grown rapidly over recent decades to become the largest single constituent.

The information technology sector is the largest individual sector in both, making up around 20% of each index.

The historic dividend yield for both indices was just under 2% as at 31 December 2020. It has been in the range 1.5%–2.5% for most of the past decade.

US equity markets

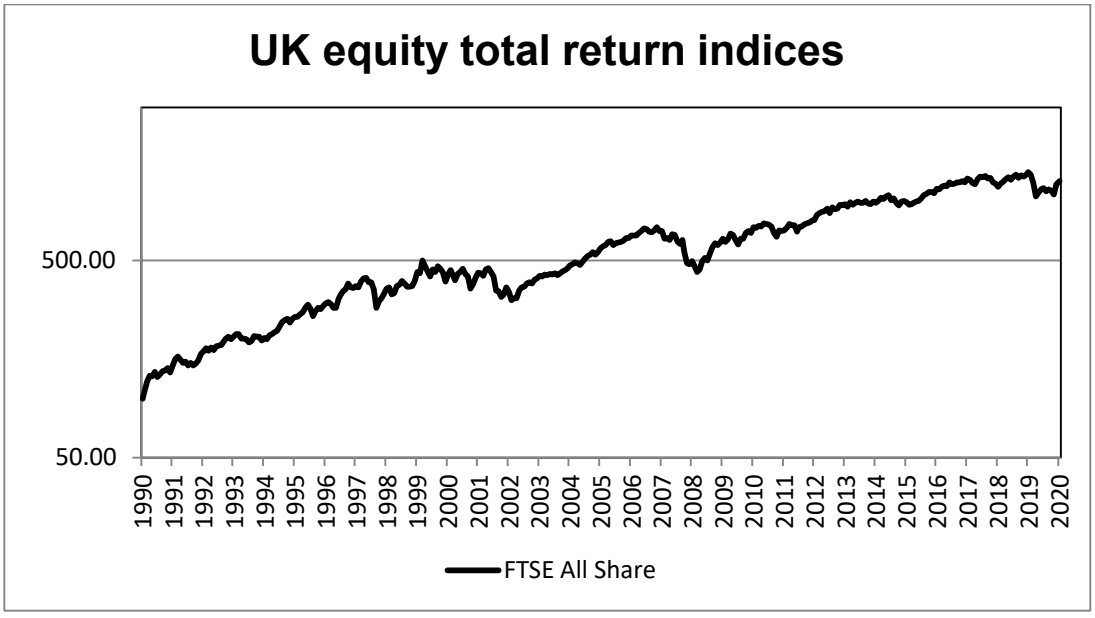


Source: St Louis Federal Reserve; IFoA calculations

Performance of the S&P500 Index, a widely used large cap market index for the US equity market, and the Russell2000 Index for small cap shares, both rebased and shown from Dec 1990 – Dec 2020.

Small cap shares have outperformed very slightly over the period but with periods of under- and outperformance at various times.

UK equity markets



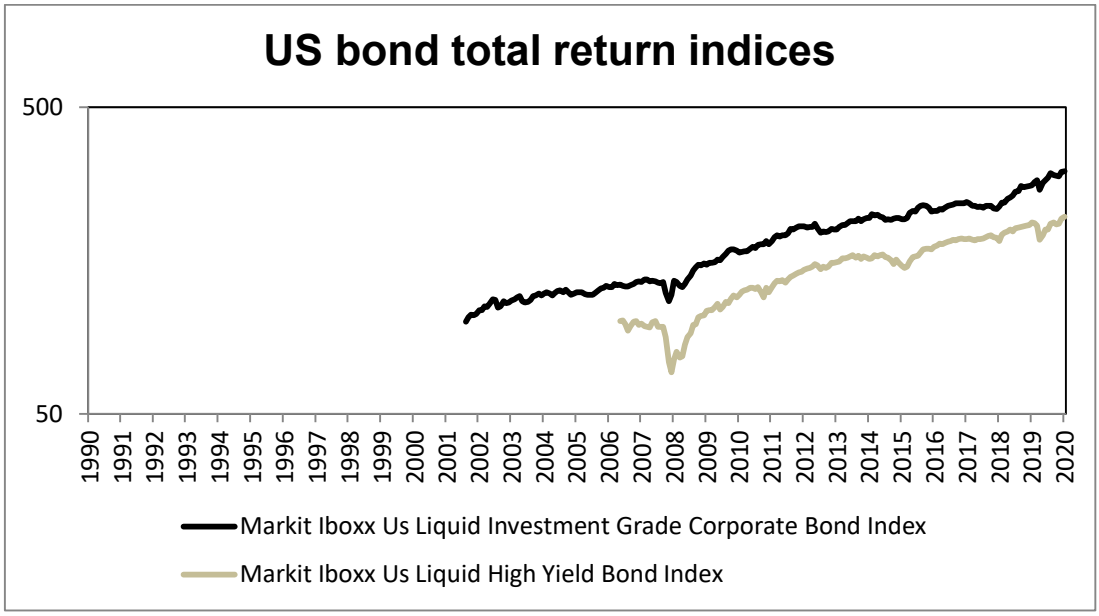
Source: London Stock Exchange; IFoA calculations

Performance of the FTSE All Share Index, the main market index for the UK equity market. rebased and shown from Dec 1990 – Dec 2020.

The performance pattern is broadly similar to the US S&P500 index. More recently the higher number of 'mega cap' technology companies on the US market has resulted in some divergence in performance.

10.2 Fixed income markets

US bond markets



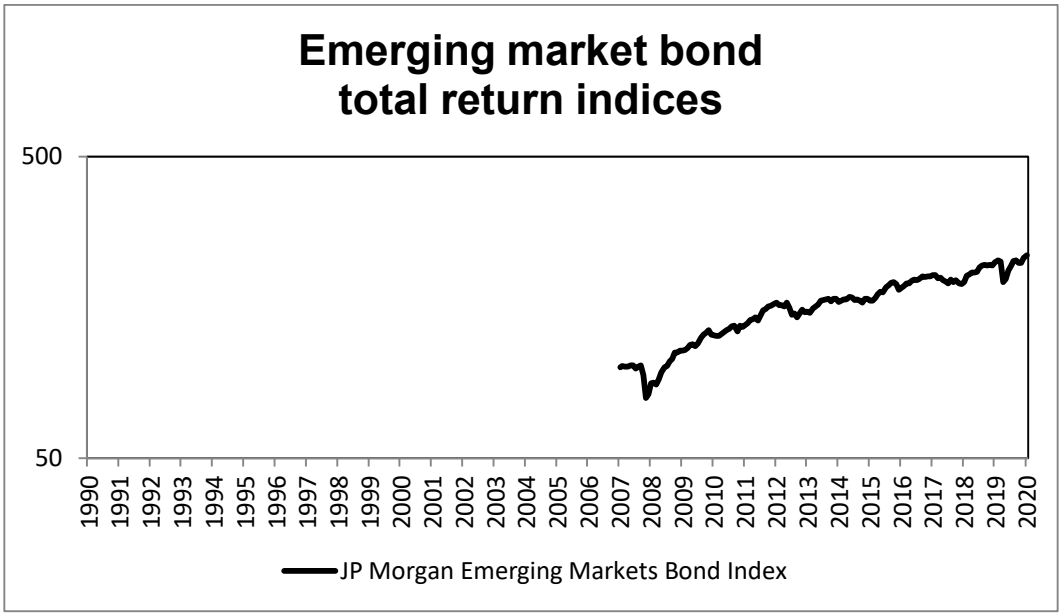
Source: iShares.com; IFoA calculations

The Investment grade index is the top line in the graph.

Performance of the Markit iBoxx US Liquid Investment Grade Corporate Bond Index and Markit iBoxx US Liquid High Yield Bond Index, both representative of the US bond market, rebased and shown from Dec 1990 – Dec 2020.

As might be expected bond indices have displayed a smoother, less volatile (and overall less rewarding) profile than comparable equities. Having said that, high yield bonds suffered particularly during the 2008-2009 financial crisis; this may be as expected since the crisis was foremost a *fixed income* or *credit* crisis rather than one affecting equities more generally.

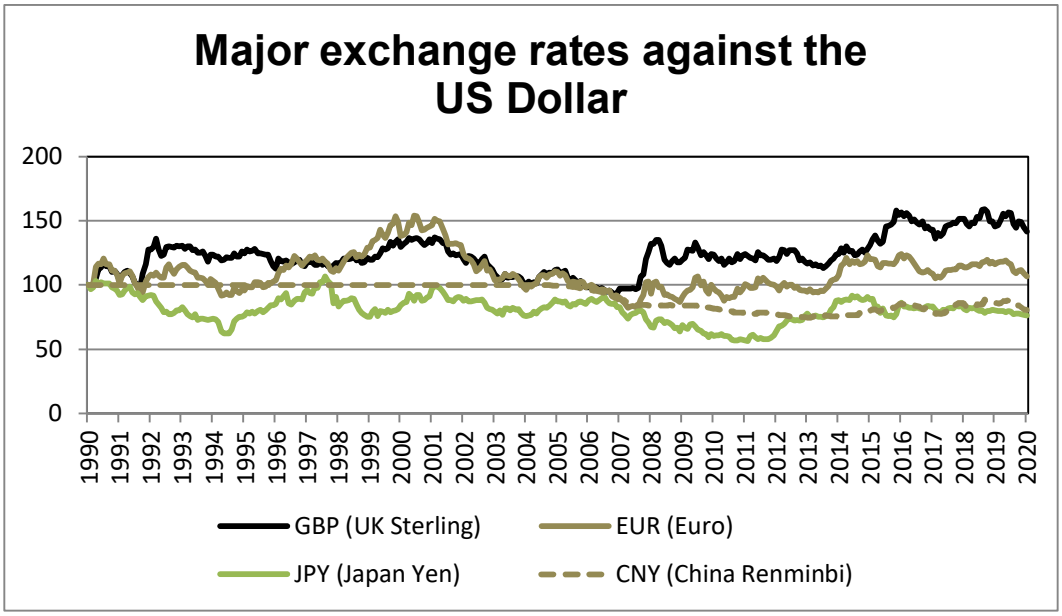
Emerging market bond markets



Source: iShares.com; IFoA calculations

Performance of the JP Morgan Emerging Markets Bond Index, a representative index of emerging market bond performance, rebased and shown from Dec 1990 – Dec 2020.

10.3 Currency markets



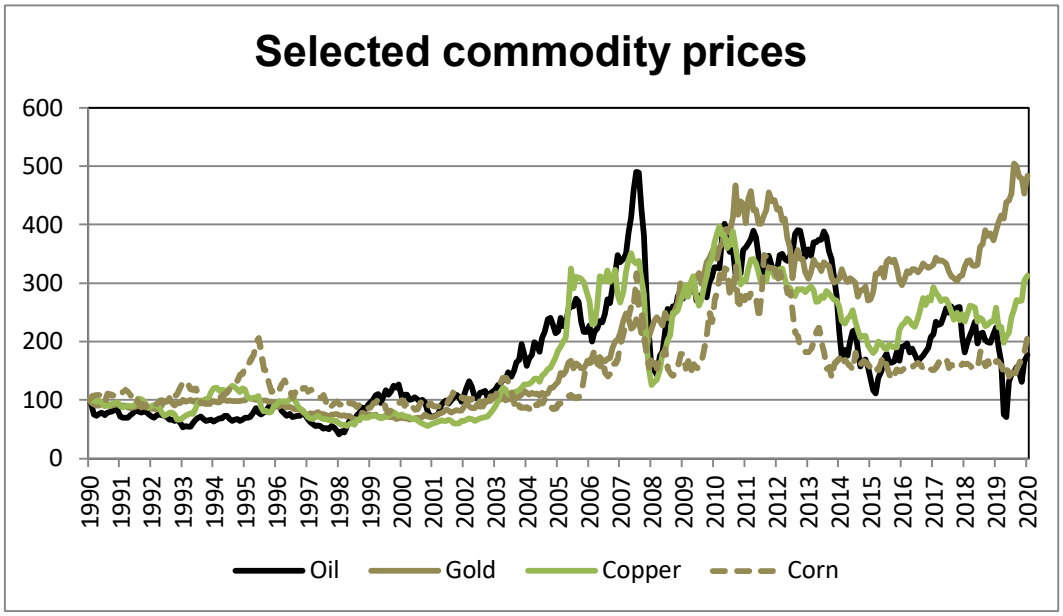
Performance of the GBP/USD, EUR/USD, JPY/USD and CNY/USD exchange rates, rebased and shown from Dec 1990 – Dec 2020 (Renminbi since Aug 2005). An increase in the chart level indicates a *weakening* of the respective currency against the US Dollar.

A rise in the currency chart indicates a weakening currency relative to the dollar.

Some exchange rates are driven by market forces whereas others tend to be managed by the relevant Central Bank (that is, the movement in the exchange rate is a combination of market forces and intervention by the Central Bank to achieve a particular level or particular path). The Chinese Renminbi for example, tends to experience less volatile behaviour than, say, UK Sterling because the People's Bank of China is more active in managing the path of its exchange rate.

Over time, exchange rates have fluctuated, however there is also an argument that exchange rates are somewhat mean-reverting – in that they return to a long-term level after short-term deviations. Certainly looking at the historical performance as above shows there have been large intra-period moves, but without an obvious trend in favour of any one major currency. Currencies which are undervalued tend to result in cheaper exports for the country in question, which increases the inflow of foreign currency from foreign consumers, which in turn causes the local currency to re-appreciate. As a consequence, many investors prefer to hedge out their currency exposure, or to engage in short-term tactical currency trading. Few investors consider unhedged currency positions as long-term strategic allocations.

10.4 Commodity markets



Source: macrotrends.net; IFoA calculations

Performance of oil, gold, copper and corn spot prices, in nominal terms, rebased and shown from Dec 1990 – Dec 2020.

Commodity prices typically exhibit greater price volatility than equities. In particular, commodities can be prone to 'bubble' and 'depression' behaviour, where belief of a shortage (or conversely belief of excess production) has a significant impact on short term prices. Also, there is an argument that the price of a commodity does not necessarily have any long-term growth underpin – unlike, say, a company which can grow its earnings year by year. Continuously increasing commodity prices would imply either an ever-worsening shortage caused by some combination of ever-increasing demand (with constant supply) or constant demand with a depleting resource. New sources of production or substitutes for demand are often found, causing the market to adjust back to a 'normal' level. An example of this would be the discovery / invention of the shale oil process over recent decades which enabled large previously-untapped oil reserves to be accessed. This was initially driven by a high oil price, promoting the discovery and development of new drilling techniques which in turn led to an increase in supply.

Students should be aware of the major events that have occurred in the last 10 years, and perhaps have an idea of the major events that have occurred in the decade prior to that. Events that have caused major market movements should be researched, and if there are any equivalences between those events and what the industry and the markets are experiencing at the present time, then students should be ready to talk about these similarities. More ActEd material on this is contained in Chapter 9.

They often say that history never repeats itself, but it often rhymes. This means that the same situations rarely occur exactly as they did before, but certain similarities in the outcomes can be foreseen and predicted. In today's markets we have a prolonged period of ultra-low interest rates, which has led to an increase in personal borrowing levels. This has happened before in the early 2000s. We have Quantitative Easing in most major developed countries which is a different strategy from anything that has been experimented with in the past. However, there are countries and periods in history where central banks have printed money, which gives some information to inform choices in the present circumstances. We are seeing a movement towards protectionism in trade, and a retreat from globalisation, which has occurred at times in the past. We are experiencing a technological revolution that is transforming the way industry operates, on a similar scale to the changes seen in other industrial revolutions. And finally, we have seen market volatility in reaction to the coronavirus pandemic, which has been particularly acute in certain commodity markets such as oil. It is good to think through the possibly scenarios and know the various possible outcomes for each, and be prepared to discuss them.

3 Key global economic and monetary trends

3.1 Monetary Policy and Central Banks

In 1971, the US officially terminated the convertibility of the US Dollar into gold, thereby making the US Dollar a fiat currency. A fiat currency is one without any intrinsic value. This brought to an end the Bretton Woods agreement for the management of international monetary regimes established at the end of World War II, whereby internationally currencies, not backed by gold, could be converted into US Dollars, which was convertible into gold. The Bretton Woods agreement was a quasi-gold standard. Before Bretton Woods, the gold standard was in operation whereby international currencies were mostly convertible into gold.

Since 1971, the money of most countries does not have any intrinsic value. Historically in such regimes the money eventually became worthless as governments began to print increasing amounts of it. As Voltaire put it, '*Paper money eventually returns to its intrinsic value*'.

A graph showing the growth of OECD broad money (M3) since 1990 is given below:

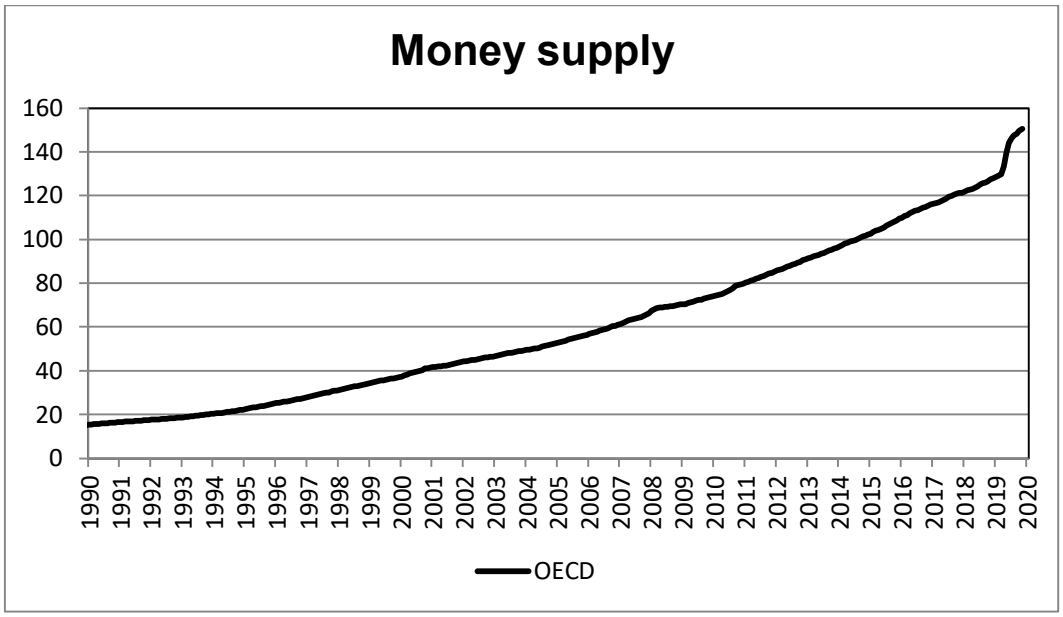
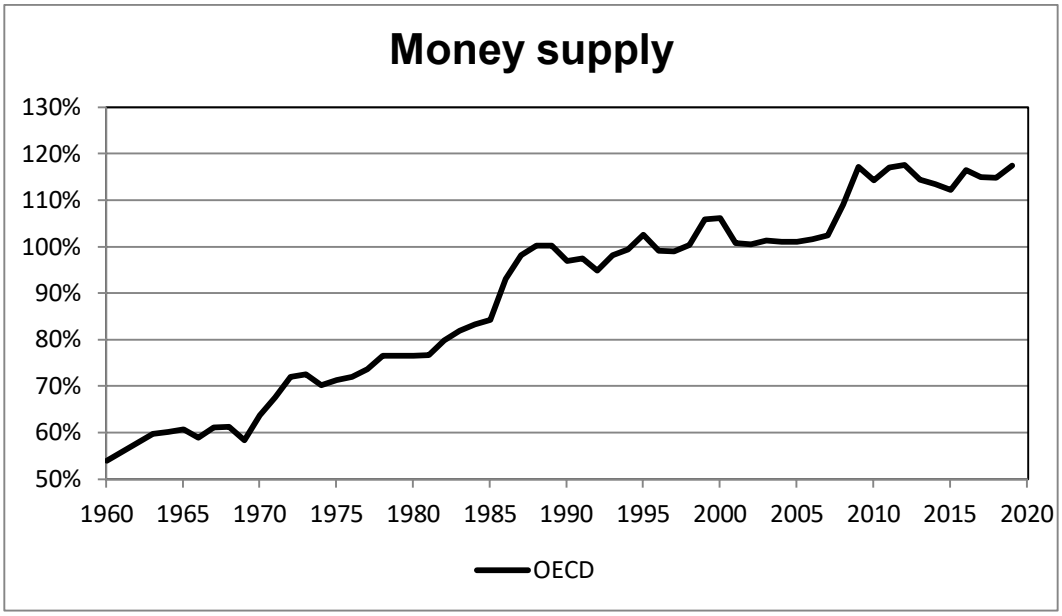


Figure 8.2

Broad money (M3) is defined by the OECD as currency, deposits with an agreed maturity of up to two years, deposits redeemable at notice of up to three months and repurchase agreements, money market fund shares/units and debt securities up to two years.

The graph shows that money supply has increased at a significant rate since the end of Bretton Woods, and very significantly since the start of 2019 in response to the COVID19 pandemic.

A graph showing OECD broad money as a percentage of GDP is given below:



Source: World Bank (http://data.worldbank.org/indicator/FM.LBL.BMNY.GD.ZS)

Figure 8.3

The graph is based on data from the World Bank and shows broad OECD money supply as a percentage of GDP increasing considerably since the collapse of Bretton Woods. For example, in UK the percentage went from 40% to almost 140% from 1960 to 2015.

Since the financial crisis of 2008 - 2009, the main monetary policy used by the large developed economies in the world has been QE. This involves the central banks printing money and buying assets that increase the size of their balance sheets.

Question

Discuss the reasons why QE has become the dominant monetary policy in developed countries since the crisis.

Solution

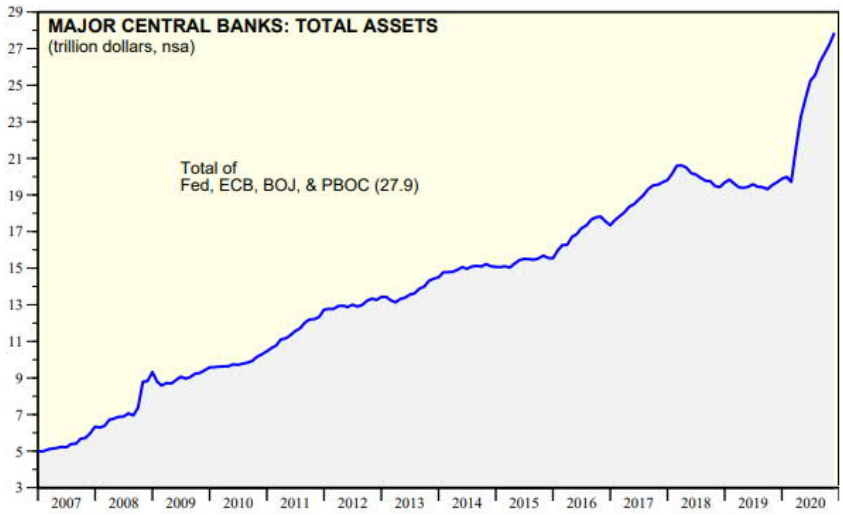
One of the main reasons is that the other traditional tool, lowering and raising short-term overnight interest rates, has become constrained by the fact that rates in most developed countries are close to or at zero. If central banks wish to stimulate growth (through borrowing) then there is no more scope for interest rate reductions. QE is then the tool of choice as its use is not constrained. A central bank can theoretically increase its balance sheet indefinitely as it is not subject to regulatory constraints such as Basel II or Basel III.

A second reason is that the developed countries have found that the currencies of countries that do not embark on QE strengthen on the FX markets, causing difficulties for exporters, and causing an increase in imports from overseas. It has therefore become difficult to resist the trend when other countries are engaging in QE. This is linked to the fact that some central banks may believe that competitive devaluation of their currency is the right thing to do at this stage in the economic cycle.

A third reason is the threat of deflation. This has been considered to be a danger since various economies became stuck in a devaluation 'spiral', whereby consumers put off any purchases because they believed that prices would be lower in a year's time. This further weakened spending and therefore caused companies to further decrease prices to sell their products, and hence deflation became worse. Many developed country central banks believe that QE is a way to avoid this, by ensuring that the commercial banks have plenty of scope to increase their lending books and expand money supply.

A fourth reason is perhaps that QE can lead to a catch-22 situation, whereby if a central bank that has undertaken significant QE states that the policy is to end or be unwound, the bond markets can collapse. This leaves the central bank with large losses (which are transferred to the government that underwrote the policy).

A graph showing the increase in the size of central bank balance sheets in these countries is given below:



Source: Yardeni Research

Figure 8.4

At the time of the financial crisis the rapid increase in central bank balance sheets was unprecedented, and in relative terms remains a very significant increase indeed. With the benefit of hindsight the continued application of QE and more recently the response to COVID 19 has resulted in balance sheets today being many multiples larger than they were before the financial crisis.

3.2 A brief history of political economy

Most western developed economies are 'capitalist' as distinct from the more centrally planned economies of communist and formerly communist countries.

Capitalist economies aim to give more economic freedom to their people. This freedom has usually enabled people to take more risk, by giving them greater access to markets and to speculate on these markets, which may result in a better allocation of capital to profitable projects (as those projects with higher expected returns attract capital). However, the same freedom also increases the volatility of the capitalist economy, as people are free to be fearful and greedy at different points of the economic cycle.

The easier access to markets brought about by financial deregulation and improvements in technology has arguably brought in more investors less well equipped to make good investment decisions (particularly individual investors) which might be regarded as also contributing to the greater volatility.

Some of the challenges of operating a free economic and political model are summarised in a discussion by the American public relations expert, Edward Bernays:

'*It might have been better to have, instead of propaganda and special pleading, committees of wise men who would choose our rulers, dictate our conduct, private and public, and decide upon the best types of clothes to wear and the best kinds of food to eat. But we have chosen the opposite method, that of open competition. We must find a way to make free competition function with reasonable smoothness. To achieve this society has consented to permit free competition to be organised by leadership and propaganda.*'

3.3 Quantitative Easing

Undoubtedly the most significant policy of the recent past has been Quantitative Easing (QE). Its impact and relationship to financial markets is summarised in the graph below:

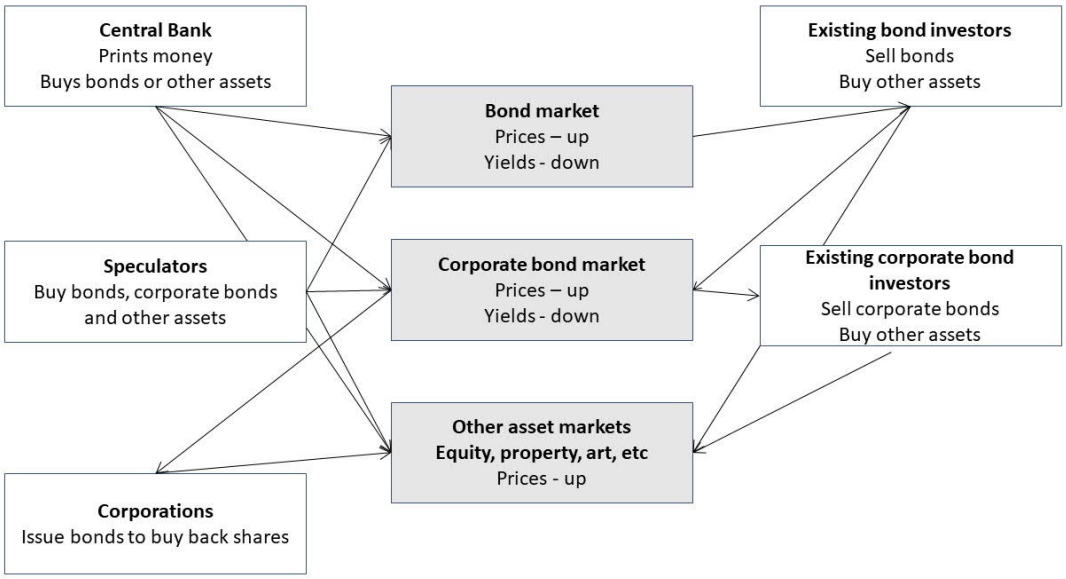


Figure 8.5

A brief summary of the impact of QE on financial markets is as follows:

- **The central bank prints new money.**
- **It uses the money to purchase assets – mainly bonds and corporate bonds but also equities (purchases may be made indirectly by buying ETFs of the relevant assets).**

Question

Describe the reasons for the central bank to buy assets such as corporate bonds and equity ETFs as part of the QE programme, rather than only government bonds.

Solution

The main reported aim of QE is to reduce the cost of borrowing for corporates, who typically borrow by issuing 10 to 30-year corporate bonds. By buying government bonds, the central bank reduces government yields, and since corporate bonds are typically issued at a margin over government yields, this leads to a reduction in corporate bond yields.

Buying corporate bonds directly will achieve the same effect, by pushing corporate bond prices up and yields down. Government bonds will benefit because investors will always buy government bonds when the yield is only a fraction less than corporates, so as corporate yields fall, so will government yields. The difficulty is that buying corporates requires the central bank to choose which corporate to buy. It could focus on the liquid large issues, but that may lead to accusations of favouritism. The central bank will want to avoid being over-exposed to one issuer in case losses are made through a default event, leading to criticism from the public and the government.

Buying equity ETFs is more difficult to justify, but if the ETFs contain diversified portfolios of equity shares, this will push equity market prices up (and have little effect on bond prices). This will mean that companies find it easier to issue equity shares (rather than bonds), and encourage rights issues, which will indirectly fuel investment and growth. The risks here are evident. The equity investments held by the central bank will be volatile and may make potentially large losses.

- **This causes asset prices to rise in each of these markets – and bond yields to fall.**
- **There will then be further ripple effects:**
  - **The bond investors who sold bonds typically will want to hold other assets in their place so will buy corporate bonds and/or other assets – in turn pushing their prices up.**
  - **The corporate bond investors who sold to the bond investors will typically want to hold other assets so they will buy other assets, *eg* equities.**
- **Speculators will likely purchase bonds, corporate bonds and other assets in anticipation of the increased demand for these assets and the consequent price increases.**

- **Corporates will likely want to take advantage of the low corporate bond yields and issue more bonds. This will partially offset the price rises in the corporate bond market. In some cases, the proceeds of the bond sale may be used to buy back their shares; this will further exacerbate the price increases in the equity markets.**
- **Overall, QE will likely lead to higher asset prices generally.**

Question

List the relative merits of targeting QE at buying a) government bonds, b) corporate bonds, or c) equity ETFs.

Solution

Traditionally QE has been targeted at government bonds, but alternative strategies have emerged. The relative merits are:

\+ government bonds should expose the central bank balance sheet to less risk

\+ government bonds will reduce the risk-free yield, and therefore the corporate yields

– there may be a shortage of government bonds for institutions

\+ corporate bonds will reduce the corporate bond risk premium and make it easier for corporates to borrow without reducing the supply of government bonds

– the central bank balance sheet will be exposed to credit risk with corporate debt or equities (more so with equities)

\+ corporate bonds or equities will diversify the assets of the central bank through its QE strategy

– the marketability of corporate bonds or equity ETFs will be much lower

\+ equity ETFs will increase the level of the equity market and make it easier for companies to raise cash through rights issues

– equity ETF buying could produce a bubble in the equity market, and the central bank could be accused of favouring one ETF over another

There may be other merits that you have thought of – the list above is not exhaustive.

Impact on asset prices

Quantitative Easing is likely to cause asset price inflation as the central bank's purchases of bonds (and/or other assets) pushes up bond prices (and/or other asset prices), which then causes a ripple of asset price increases in other asset markets as the sellers of the bonds look to buy other assets to replace them, and these sellers in turn look to buy replacing assets. Speculation will further add to the asset price inflation.

Impact on wealth and economic inequity

Asset owners will see their wealth increase – causing a wealth effect. Those with no assets will see no gains – and will be relatively worse off having not participated in the windfall. The overall result is likely to be an increase in economic inequality.

Impact on economic growth

Economic growth is likely to increase due to the wealth effect created. Those who receive wealth gains will have higher purchasing power and when these gains are spent the economic activity created should also mean increased employment. The impact will mostly be in areas with a higher concentration of asset owners. Those without assets will gain from seeing more jobs being created, as money 'trickles down' to them. Overall, the impact is unlikely to be significant and also possibly transitory if the asset prices revert to their mean levels in time.

Impact on price inflation

Retail price inflation rates are likely to stay low. Less wealthy people will not see any significant gains from QE. Indeed, retail price inflation may even fall or turn into deflation, as the relatively less well-off may be worse off, meaning average demand for a normal basket of goods may fall, leading to lower prices.

Question

(i) Describe how increasing or bubble-level asset prices could feed through to domestic inflation.

(ii) Describe how traditional QE could feed through to higher inflation.

Solution

(i) *Asset prices*

One way is that owners of assets (such as houses, pension pots, or savings products such as unit trusts, investment trusts or ETFs) will feel relatively well off. This may lead to more borrowing, perhaps secured on the assets (for example equity release, or early reductions of pension pots) in order to increase the quality of life. Such borrowing may well result in greater demand for goods and services that are included in the inflation basket such as food, restaurant services, cars and holidays. This will ultimately be recorded in the CPI index and result in inflation.

(ii) *Traditional QE*

If banks exchange their government bonds for central bank cash as part of the QE process, they will be free to expand their balance sheets. Under the fractional reserve banking system, banks' balance sheets are limited to a multiple of the notes and coins and other central bank deposits that they own. If commercial banks receive large amounts of central bank cash deposits, then they will be free to lend to individuals and companies at a higher rate, and will not be restricted by the fractional reserve system. Too much bank lending has in the past led to too much spending, which drives inflation of prices of goods and services.

Impact on wages

Nominal wages should see small and marginal gains. The economic growth impact is unlikely to be very significant – so the demand-pull effect will be small. Most of the increase in employment is likely to be in the service industry to service those with greater levels of wealth. These are often poorly paying jobs.

Real wage increases may only be very small due to low inflation, however due to increased asset prices the purchasing power of those real wages may be considerably lower.

Impact on bank lending

Banks will have more cash from selling bonds to the central banks, so banks will have the potential to lend more. However, they will only lend more to those who they think will be able to repay the loans – and these will mostly likely be those who have greater levels of assets as they become wealthier.

Also, low interest rates – as caused or maintained by QE – have a detrimental impact on banks' lending margins, which dampens the overall willingness of banks to lend.

As mentioned earlier, the impact of the fractional reserve banking system considerably enhances this lending freedom for commercial banks.

It is likely that the biggest beneficiaries of QE will be those with assets portfolios. However, most people benefit from lower interest rates, whether it is through cheaper mortgages, access to bank lending, or through the increase in profits of companies which may lead to greater recruitment and higher salaries.

3.4 Risks arising from QE

QE is leading to significant bubbles in asset markets. Low interest rates mean that future equity earnings will be discounted using very low interest rates. As these move towards zero, theoretical equity prices move to infinity. If asset prices are overvalued due to the impact of QE, then future expected asset return assumptions are likely to be much lower than historical data.

The main market that will be overvalued will be the government bond market in most economies. But this will lead to higher valuations on other asset classes, and has also led to much higher valuations of liabilities.

QE is also likely to impact corporate finance decisions, meaning otherwise poor projects will get finance as they show profitability using the low interest rates, even though they might not show profitability under normal interest rates. This aspect was famously highlighted by John Mills in his 'Credit Cycles and the Origin of Commercial Panics', where he said that, '*Panics do not destroy capital; they merely reveal the extent to which it has [already] been destroyed by its [allocation to] hopelessly unproductive works*'.

So, artificially low interest rates cause inefficient capital use. This shows up in terms of companies borrowing and investment policies, and personal borrowing and spending policies. If an economy is not allocating and spending capital efficiently then over the long term, it will perform poorly. However, in the short term, while borrowing is cheap, very few are likely to complain.

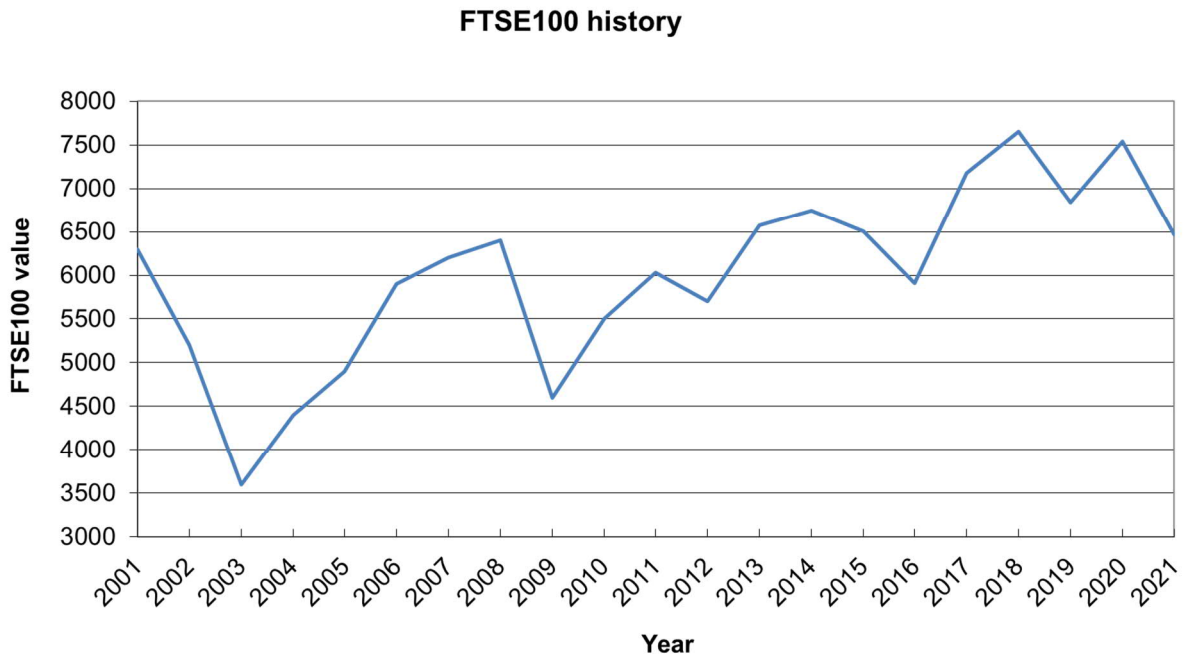
5 Historical analysis of investment returns

Students should have an overview of recent historical returns and are encouraged to review publications such as *The Financial Times*, *Investors Chronicle* and *The Economist: Intelligence Unit 'Country Reports'* for the UK, US, China, Japan, Germany and France (which are available on the IFoA's website (https://www.actuaries.org.uk/learn-and-develop/research-and-knowledge/library-services)).

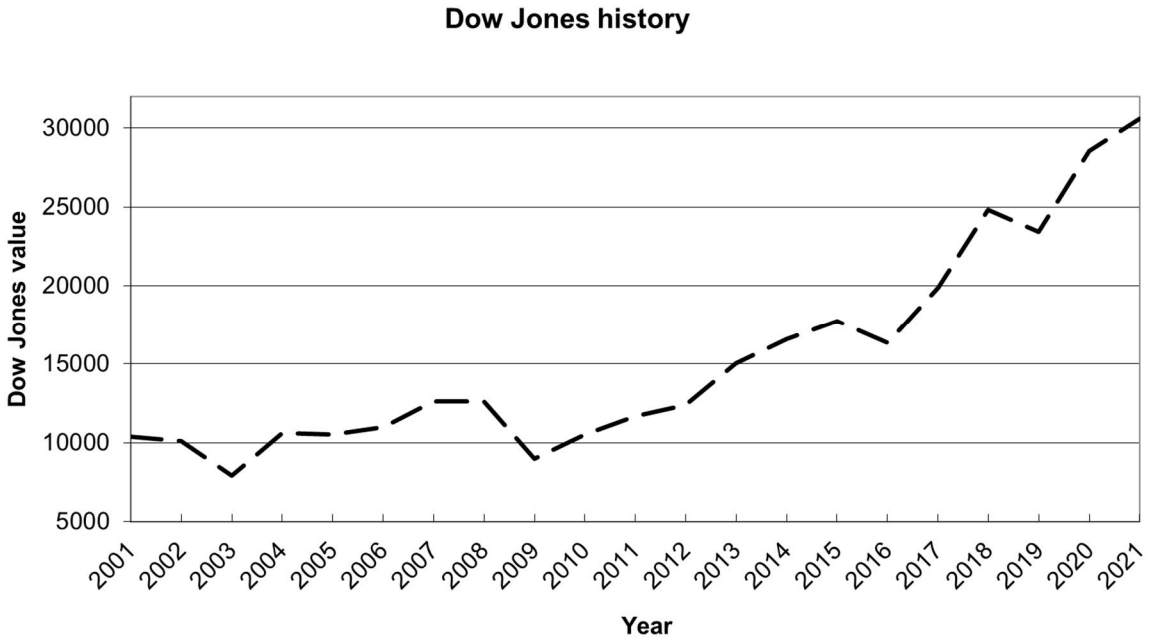
It is useful to have a reasonable recollection of the development of the major markets in recent times, even if the specific events are not known in detail. The following gives an account of the major markets over the last 20 years, which may be of interest.

5.1 UK and US markets

The following chart shows, in very rough terms, how the UK equity market has performed since 2001. There is only one plotted point per year, so a lot of the detail is missing, but for the purposes of SA7 it is the big picture that matters. In particular, the data points are at the end of each year, and the data runs to the beginning of 2021, which includes the pandemic effect in 2020.



The US market has performed much better than the UK over the last 20 years as can be seen from the following chart. A lot of this was due to the emergence of certain large tech stocks that have grown enormously over the period, and are included in the index. It has also benefitted from the massive government stimulus that successive governments have provided.



Period to 2000 (prior to graph)

During this period the UK market performed very well, in line with the performance of the US market at the time. The main driving forces behind the market were the IT bubble and falling inflation. The IT bubble pushed shares strongly upwards on expectations of monstrous profits in a brave new world. Inflation (for example in the UK) fell from around 5% *pa* in 1995 to 2.5% *pa* in 1999. At the same time, long interest rates were falling, partly due to lower and stable inflation, and partly due to the introduction of a European common currency, which had the effect of driving all bond yields down to the lowest common denominator. At the start of this period many economies in Europe (including the UK) had budget surpluses – *ie* the government spent less than it received in taxation.

The effect of this on pension schemes was mixed. Most schemes (particularly in the UK and the US) had asset portfolios that were very close to a peer group average, and which contained a high proportion of equities. The effect of falling interest rates was offset by strong equity growth, and surpluses were common. Indeed this was a time when contribution holidays to *remove* surplus were still commonplace.

2000 to 2002

This was an eventful period when equity markets fell and interest rates remained low. The main causes were the bursting of the IT bubble and the loss of confidence that followed. In addition, the events of 9/11 and the introduction of international tensions in Afghanistan played a major role, along with some accounting scandals in the US that lead to the demise of some large companies. Central banks pushed interest rates as low as possible to fend off recession. European growth rates at this time were very poor, but the UK and US escaped with only modestly lower growth. During this time the UK public spending increased considerably, and the budget moved into significant deficit. Because of the higher level of growth in the UK than in Europe, the UK budget deficit remained lower than that of Germany and France.

The impact of these market movements was quite profound. Pension scheme deficits appeared, and were put in the spotlight due to new accounting standards. This caused many to try to sell equities and buy bonds, which further aggravated the situation. Life insurance companies found that solvency was under pressure, and were forced to sell equities to maintain solvency. The combination of accounting standards, the Myners report (which suggested that a move away from peer group matching and towards liability or bond-based matching would be good) and chaotic stock markets led to a number of important changes, and started the trend towards more liability driven investment approaches.

2003 to 2006

During this period the market advanced steadily, almost reaching its earlier highs. Despite further terrorist uncertainty and the war in Iraq, economic growth was robust and equity markets grew in confidence. Falling equity risk premiums around the world lead to increasing equity prices. Short-term interest rates remained extremely low which boosted economic growth but also fuelled the increase in house prices, particularly in the UK, US and some European countries (such as Spain). Strong growth in some emerging economies such as China and India began to cause shortages in commodities, which in turn began the rise in commodity prices. The budget deficit in the UK grew to more than 3% of GDP. The true extent of the deficit was however being hidden by a bank lending bubble which was building up in preparation for a crash. Fortunately, due to the demand for bonds from the pension industry, the issuance of bonds was easily absorbed by institutions and yields remained low. Retrospectively, it is possible to see that this period was fuelled by easy credit, low interest rates, and low corporate bond yield premiums. This was the bubble that was about to burst.

During this period, the pensions industry saw a continued move towards de-risking company balance sheets, which often involved either closing schemes or following an LDI approach. Some companies used improved profitability to repair the deficits in their company schemes. Deficits were also improving due to strong equity performances and some companies were keen to lock in the existing deficit before any unexpected problems arose.

2007 to 2010

The sub-prime crisis began to affect sentiment in the US and subsequently in the UK. House price falls in the US (and elsewhere) affected consumer confidence and left the more aggressive banks with a lot of potentially poor quality mortgages, which were not covered by the value of the houses. Due to securitisation and structured lending, these problems affected everyone, and an air of mistrust began to envelop the banking sector. This culminated in the nationalisation of Northern Rock in the UK and problems with Bear Stearns and Lehman brothers in the US, and led banks to reduce substantially the amount of credit that they were willing (or able) to extend to consumers. During this period of uncertainty, equity prices fell substantially and volatility increased significantly in the equity market. Commodity-based companies were initially the exception to this, as the surge of commodity prices continued and oil prices rose above $140 per barrel but then fell again to around $100 per barrel. Commodity prices then fell back to previous levels. Bond yields remained low. Central banks reduced short-term interest rates to almost zero, and the UK and US began aggressive quantitative easing.

2011 to 2016

As the economy faltered, corporation tax revenues from banks fell and unemployment rose (again a function of the bank bubble bursting). The budget deficits of major countries rose enormously, leaving the UK in a worse position than many other European countries. However, due to the demand from pension funds, the continued belief that inflation was under control, and the Bank of England's policy of quantitative easing, yields on bonds continued to decline.

The Eurozone crisis began to take centre stage. Greece, Cyprus, Ireland and Portugal all required European and IMF bail outs from funds provided by Germany, France and to a lesser extent, the UK. The US has seen its government bond credit rating reduced but this had little effect on bond prices.

During this latter period, equity volatility continued to fuel the drive towards de-risking, closing schemes and LDI. Due to the fact that the problems were most acute in the UK and the US, where borrowing levels were much higher than elsewhere, and where house prices had risen far further than elsewhere, the pound remained at a lower level than historically, and the US dollar also struggled (but to a lesser extent). This underlined the advantage for institutions of having a diversified asset portfolio.

From 2013, quantitative easing was scaled back in the US, and subsequently reversed − in the UK no more QE was carried out for quite a few years until the BREXIT vote in 2016, when it was restarted very modestly. QE in the European Union continued at higher levels throughout. The outstanding gilt holdings by the UK central bank reached high levels (over £430*bn* in 2016). The UK central bank governor indicated that he did not foresee the gilt holdings ever being unwound.

2017 onwards

Greek deficit worries and austerity came back to the fore. The UK deficit, which was meant to be eliminated in the 5-year term of government (ending 2015), had only been reduced to a forecast £40*bn* for 2019/20. The UK deficit was stubbornly high and the government was unable to balance its books; expanding population and increasing GDP did not lead to sufficient increases in taxation revenue. Government costs were only modestly reduced compared to some other countries in the Eurozone.

The coronavirus pandemic struck in early 2020, and governments in many countries locked down populations and stopped many industries, leading to a sharp reduction in tax revenues and a sharp increase in government spending and support. This borrowing was on an unprecedented scale, with the UK forecast to borrow in the region of £350*bn* for the year. These sums can only be financed by printing money, and QE in the UK was increased to £850*bn* to buy the debt that the government was issuing. QE increased massively in most developed countries, and it was started in many countries that had never tried it previously. This included countries in Latin America, some gulf states, countries in Africa and also Indonesia.

BREXIT (achieved at the end of 2020) had little impact on markets, and some details are still being negotiated at the time of writing. Sentiment in markets is being driven by the political changes that are occurring in the US, including the massive stimulus package. The virus remains a big issue, and investors are trying to predict the economic outlook as countries emerge from the pandemic, in particular whether inflation will finally raise its head.

5.2 Europe

The European banks were affected by the credit crunch in 2008, and some large German, Swiss and French banks were forced to write off large sums of money and resort to government aid. Although this had an effect on the economies, it was not as great an effect as it was in the UK and US where the banking systems represent a larger proportion of the economy. The major European economies are affected by uncertainty in the US and Chinese markets, because these are large export markets for them. The Eurozone dealt with the government deficit problems of many of its nations. The ECB embarked on quantitative easing to ease the problems in the banking sector, and increased QE to cope with the pandemic costs.

Question

A UK pension scheme wishes to improve its inflation hedging strategy. What instruments could act as good inflation-hedging assets?

Solution

Good inflation-hedging assets

- Index-linked bonds, which are available in various terms in the UK and are relatively marketable.
- Infrastructure bonds, which are relatively long term, can be found in reasonable size, but are usually unmarketable.

- Property assets, where rents should rise in line with inflation. Although these should match inflation over the long term, the short-term price fluctuations may make this category a poor hedge.
- Inflation swaps, which offer actual inflation on one leg in return for a fixed stream ('expected inflation'). These would need to be combined with a government bond to supply the fixed stream. They are relatively easy to undertake in significant size, but are difficult to exit from.
- Index-linked bonds of overseas (non-UK) governments. Much inflation is global, and caused by commodity price rises, labour cost increases, climate costs, *etc*, so any index-linked bonds should provide high correlation to UK index-linked bonds. There would be a currency risk. However, according to purchasing power parity, the currency should hedge UK inflation in the longer term. If the UK has higher inflation than the overseas country, its currency should be weaker, and the overseas currency should be stronger. So the additional return on the currency should make up for the lower return on the overseas index-linked bonds.
- Liability-driven pooled funds that aim to give index-linked returns. These funds are offered by fund managers and will contain inflation-linked securities and derivatives, but they benefit from being simple to purchase and value, and may have improved marketability.

Because many European countries operate their pension schemes in a very different way (more like an insurance contract), they are not affected by equity volatility in the same way as those in the US and the UK. LDI has not had the same popularity in Europe as it has in the UK. On the other hand, European companies did not benefit from the equity market returns over the 80s and 90s, as UK companies did. The coronavirus pandemic has had major impacts on most EU countries, and there are several countries where additional government debt is being added to already large amounts of borrowing. Much of the new debt is being purchased by the ECB.

5.3 Japan

In many ways, the difficulties experienced by Japan since the early 1990s are similar to what the UK and US experienced during the banking crisis. (History never repeats itself, but it sometimes rhymes!) Asset prices were very high, and banks extended loans secured on those assets until eventually the bubble burst. The banking sector was very weak for more than a decade in Japan, and the government increased spending to help push the economy out of recession. The Central Bank of Japan also resorted to quantitative easing during this time to inject cash into the economy.

It is interesting to search on the internet for a long-term chart of the Nikkei index, which shows how the Japanese market has performed since the 1980s.

Japanese interest rates and inflation have been very low for a long time. Deflation was a problem at times over the last two decades.

Japanese bond yields have been very low (almost zero) for almost two decades because of the low or negative inflation, and QE.

The economy was badly impacted by the tsunami in early 2011. The cost of rebuilding was estimated to be around $50*bn*, which was financed by more government debt.

6 Current market yields

In some circumstances you may be required to demonstrate your knowledge of current market yields. The following table contains the most important items, updated as at June 2021, but you should keep an eye open for any *major* changes in these. The table contains some empty cells for you to use to add the up-to-date yields as you get close to the exam. In SA7 it is rarely essential to know the yields and PEs to the second decimal place, but a broad idea to within a half percent is recommended.

	Jun-21				Review nearer exam!			
	UK	US	Japan	Germany	UK	US	Japan	Germany
Short-interest rate	0.1%	0.0%	0.0%	0.0%				
Equity market PE (*)	21	40						
Equity market dividend yield (*)	2.7%	1.4%	1.4%					
10 year bond yield	0.9%	1.1%	0.2%	-0.3%				
10 year Index-linked real yield	-2.5%							
Ultra-long gilt yield	1.2%							
Ultra-long index-linked real yield	-2.1%							
Inflation (CPI)	2.1%							
Corporate spread over gilt 'AA'	1.1%							
VIX index		16%						
Crude oil		$69						

(*) PE ratios and dividend yields affected by companies stopping dividends and posting losses during pandemic

Most of these can be obtained from the back few pages of the weekend FT, and commercial property rental yields can be found on the internet. The sections that are shaded are less important from an exam perspective. Anything that becomes topical, or changes a great deal in the 18 months prior to the exam, is more important, even if it is not on the table above.

X6.3 The concept of ESG has been around for many years but continues to grow in importance. As actuarial adviser to the trustees of a large pension scheme, you have been asked to participate in a committee that aims to re-draft the investment mandates awarded to a specialist equity manager and a specialist corporate bond manager. The sponsoring company manufactures insulation products for the building trade and has manufacturing sites in many corners of the world as well as using third-party manufacturers for some outsourced operations. In recent years there have been more frequent disruptions and protests at the company's head office due to its use of petrochemicals in the manufacturing process. The company itself has always taken whatever steps it can to reduce its carbon footprint. The objective of the current mandate review it to ensure that the pension scheme is also doing all it can to discourage petrochemical usage and encourage manufacturing in the most environmentally friendly manner, focussing on reducing climate risk.

(i) Describe the aspects of any ESG restrictions in the investment mandate that should be considered before they are agreed with the respective fund managers. [10]

Two potential approaches have been proposed:

1. Place maximum limits on the exposure to shares or bonds of companies whose main business is linked to the exploration, production, refining or processing of fossil fuels.

2. To actively participate in a number of reputable shareholder lobby groups that work with the managers of companies in the petrochemical sector to enforce and report on progress (or lack of it) in eliminating each company's carbon emissions.

(ii) Outline the pros and cons or each proposal. [8]

The trustees are finalising the investment mandate for the specialist active bond manager, and are considering the choice of benchmark index against which the manager's performance will be measured. Initially the iBoxx investment-grade UK bond total return index was proposed, but one trustee has suggested as an alternative that the benchmark should comprise of a weighting of 20% of that index and a weighting of 80% of the iBoxx non-financials bond index. In this way the weightings can be used to give more prominence to bonds issued by non-financial companies. The weightings between the two would be rebalanced (or changed) each quarter.

(iii) Discuss the merits of the alternative proposal. [5]

[Total 23]

END OF PAPER

But this could result in paying high fees for a cash portfolio. [½]

This can be seen as a risk control that reduces the equity exposure when markets are overvalued. [½]

[Maximum 3]

(c) ***A high dividend portfolio***

These funds are usually targeted at individuals who require a high level of income but wish to maintain some exposure to capital growth opportunities. [½]

Companies with a high dividend yield tend to have less volatile prices and often offer a solid value proposition, attributes that the fund might like. [½]

But they would also tend to produce slower capital growth. [1]

The focus on yield is likely to be at the expense of superior overall returns which are what the active members would want an equity portfolio to deliver. [½]

There is likely to be a large overlap with the deep value fund at times so this fund would cause some duplication among the satellites. [½]

[Maximum 3]

Solution X6.3

(i) ***Aspects of ESG restrictions to consider***

Whether the restrictions will have a measurable impact on the future investment returns of the scheme. [½]

By restricting the manager's investment universe, it is likely that the future returns from the scheme will be lower, and therefore the costs of providing the benefits will be higher. [1]

This will be very hard to quantify, if not impossible, as the assumptions required will be extremely subjective. [½]

Companies involved in less environmentally friendly industries are often unpopular, and therefore the shares are cheaper, offering a higher return. These would not be present in the portfolios. [1]

Fund managers will increase fees to reflect the work that they are required to perform when checking compliance, and this will also impact future returns. [1]

Possible risks associated with the restrictions should be considered, such as: [½]

- whether the restriction will fade from public gaze to be replaced by another which is not incorporated into the current mandate restrictions. [1]
- whether the restrictions could force investments elsewhere into industries that have a greater negative climate impact. [1]

[Markers, give up to 2 marks for any examples of risks caused by ESG restrictions]

The mechanism describing how the policies will be implemented… [½]

… as this will involve defining precisely which companies pass and which fail the criteria. [½]

The criteria must be measurable so that the fund managers can determine whether they are complying or not, as there will have to be consequences for non-compliance. [1]

Whether all capital from affected companies are included (*eg* bonds and equity) and whether companies that are closely tied such as subsidiaries or partners would also be impacted. [1]

The buy-in and agreement among all stakeholders is an important aspect to consider. [½]

If not all stakeholders are on board, this can lead to arguments and accusations down the line if the ESG policies have consequences that were not as expected. [1]

The stakeholders in this case would include the sponsor, member representatives, the fund managers themselves, and any advisors that will be assisting in drafting and monitoring the ESG policies. [1]

How the policies are documented. [½]

Documentation must be thorough, detailing how and when compliance will be measured ... [½]

... including penalties for non-compliance ... [½]

... procedures for updating or replacing policies over time ... [½]

... and how members and other interested parties will be kept informed over time. [½]

[Maximum 10]

(ii) ***Comment on each proposal***

Proposal 1 (negative screening)

+ The policy is a simple one to communicate to the public and the protestors.

+ The policy would definitely have a direct impact on the portfolio and so would achieve something (many others only achieve subjectively measured changes).

+ Avoiding the bonds (and shares) of impacted companies may make it harder for those companies to raise finance and therefore to expand.

– Defining 'fossil fuels' will be subjective, as many people consider the use of radioactive material, rare earth metals *etc*, to be as damaging.

– Determining whether the use of fossil fuels represents the 'main business' will be subjective.

– Almost all companies report in a way that emphasises the positives and plays down the negative aspects of their business, and have been doing so for decades.

– Selling the shares or bonds of the affected companies will not impact the company's business, it will only change the ownership.

– Selling the shares or bonds of affected businesses will mean that the pension scheme no longer has a vote or a say in the activities of the company.

– The policy could cause the shares of companies to become cheap and leave them exposed to bargain takeovers from companies in regions that have no issues with fossil fuels.

– The policy could cause ownership of such companies to move overseas, causing the loss of intellectual property that the companies own.

[Maximum 8 half marks]

[Markers give appropriate half marks for relevant pros and cons]

Proposal 2 (active ownership)

+ The approach is constructive rather than destructive.

+ There is less work for fund managers, which will limit the cost of the proposal on the fees charged.

+ The analysis will be carried out by experts within the lobby groups who should be aware of the industry, the competition, and be able to weigh up the good and the bad.

+ Combining forces with other institutions can increase the impact, whereas selling shares or bonds may be considered irrelevant.

– The lobby groups can be taken over or run by activists with extreme views that do not conform with those of the sponsor.

– The lobby groups may end up acting against the sponsor itself, leading to more negative publicity.

– The proposal does not work for bond portfolios as bondholders have no voting power.

– In many cases it is impossible to eliminate carbon footprints, and therefore the policy will be targeting something that is unachievable.

[Maximum 8 half marks]

[Markers give appropriate half marks for relevant pros and cons]

(iii) ***iBoxx weighted index combination***

The proposal would certainly allow the trustees to control the proportion of bonds that are issued by financial and non-financial companies. If they are nervous about the health of the financial sector then this would give them a performance advantage. [1]

The proposal relies on the fact that the manager would use the weighted notional index as a matched starting point and deviate from that base. [½]

The proposal would lead to more rebalancing in the portfolio at the end of each quarter, which would increase dealing costs. [1]

Trading would be required when:

- the weightings were rebalanced by the trustees [½]
- the performance of one index was greater or less than the performance of the other during a quarter and the portfolio needed to be returned to 80/20 [½]
- the number of constituents in each index changed during the quarter, changing the market capitalisation of the indices ... [½]

  ... for example when some bonds drop out of or enter into the 'investment-grade' category, or become too short. [1]

There would be an element of contracyclicality as the manager would be forced to sell bonds of non-financial companies if the non-financial index outperformed over time in order to keep the actual fund in line with the benchmark weightings. [1]

There will be fewer managers willing to pitch for the business, as the notional portfolio is less common or standard. [½]

The manager would know that it will be harder to find derivatives such as futures and options that could be used in the management of the portfolio. [½]

[Maximum 5]

