Subject SP5

CMP Upgrade 2021/22

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.

We only accept the current version of assignments for marking, *ie* those published for the sessions leading to the 2022 exams. If you wish to submit your script for marking but have only an old version, then you can order the current assignments free of charge if you have purchased the same assignments in the same subject in a previous year, and have purchased marking for the 2022 session.

1 Changes to the Syllabus objectives

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

Objective 1

The following bullet points under Objective 1.2 ('Discuss the principles underlying the legislative and regulatory framework …') have been REMOVED:

- trust law.
- EU legislation
- role and responsibilities of directors.

Objective 8

Objective 8.2.2 has been generalized and now reads:

> Explain the problems encountered in constructing indices of unlisted or illiquid assets.

2 Changes to the Core Reading and ActEd material

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

Chapter 1

Section 2.1

The following two paragraphs of Core Reading have been added to this section (the latter having been moved from Section 2.4):

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.

Section 2.4

The first paragraph has been extended and now reads as follows:

Risk management is a feature of the course emphasising both actuarial and investment aspects. Liquidity risk, counter-party risk, operational risk and credit risk also feature as do risks not originating from within financial markets – but which can impact them significantly – such as climate risks.

Chapter 5

Section 9.2

The second paragraph of Core Reading in this section has been updated, and now reads as follows:

The ETF's performance tracks an underlying index, which it is designed to replicate. Although the first ETFs tended to track broad market indices, more recent ETFs have been developed to track sectors, investment styles, credit, global investments, commodities and currencies, or themes such as environmental and social characteristics. By the end of 2019 global ETF assets were in excess of $6*trn*, with the largest single fund (SPDR S&P 500) having assets under management in the region of $250*bn*.

The list of popular families of ETFs has been updated, and now reads as follows:

- **iShares which cover broad-based US, International, industry sectors, fixed income and commodities**
- **the Vanguard family of ETFs, provided by the Vanguard Group whose founder John Bogle is often credited with inventing the ETF**
- **SPDRs (which track the S&P 500 and major sectors of this index)**
- **VIPERs (which range from broad-based to industry sector as well as international and bond ETFs).**

Chapter 7

There have been a number of changes to the Core Reading in Sections 2.1 to 2.3, some of which are quite subtle and some are more significant. Replacement pages, which are provided at the end of this update document, contain the main changes.

Section 2.8

The Core Reading now makes clear that this further reading is not examinable.

Chapters 9 & 10

The following bullet points under syllabus objective 1.2 ('Discuss the principles underlying the legislative and regulatory framework …') have been REMOVED:

- trust law.
- EU legislation
- role and responsibilities of directors.

In Chapter 9, an abbreviated version of Section 1 has been retained, albeit that it now does not contain any Core Reading.

In Section 4.5 of Chapter 9, a non-UK example of fiduciary law has been added, as follows:

Other countries are taking similar steps. In Brazil for example the National Superintendence for Pension Funds has incorporated the need for pension funds to consider environmental, social and governance aspects in their investment risk analysis into current regulations, whenever possible, as well as the need to comply with these guidelines in the investment policy.

In Chapter 10, Sections 3 and 4 (and the corresponding parts of the chapter summary) have been removed – reflecting the deletions from Syllabus Objective 1.2 (described above). Section 5 has been renumbered to be Section 3.

Chapter 11

Section 1.1

Two paragraphs of Core Reading in this section have been updated, and now read as follows:

Changing economic factors affect different companies to different extents and possibly in different ways and so alter their relative share prices. Similarly environmental factors such

as climate change (and potential regulatory responses to these – for example, banning certain activities) can have a material impact on companies and their share prices.

The study of the economic, financial and environmental factors affecting a company's share price is known as fundamental analysis.

Section 1.2

The list of factors affecting the relative market price of a share has been extended to include:

- **sustainability and environmental impact of the business**
  - the potential influences of ESG factors on a company's performance were discussed in an earlier chapter.

The list of investigations that a fundamental analysis might undertake (in order to form a view on the preceding list of factors affecting the market price of a share) has been extended to include:

- **current and future environmental changes and potential regulatory responses to these**

Section 1.3

The Core Reading list in this section has been adjusted and extended and now reads as follows:

- **the financial press and other commercial information providers**
- **the trade press**
- **relevant government and industry forums, websites or reports**
- **public statements by the company**
- **the exchange where the securities are listed**
- **statutory information that a company has to provide**
- **visits to the company**
- **discussions with company management**
- **discussions with competitors**
- **stockbrokers' or investment bankers' publications.**

The Chapter 11 summary pages have been updated to reflect the above changes.

Chapter 12

Section 1.7

The first two paragraphs of Core Reading in this section have been updated, and now read as follows:

The traditional difference between many (OTC) forwards and (exchange-traded) futures was that forwards often had no cash flow until the maturity. For a future, there are daily marking-to-market and settlement of margin requirements.

However, since the financial crisis of 2007/8, many forwards do require to be cleared through a clearing house, which involves margin agreements and margin payment cashflows in the same way as futures. In such cases, the difference between forwards and futures becomes blurred.

Chapter 14

Section 2

The section on the Oil and Gas industry group has been amended and now contains the following two paragraphs:

Oil and gas companies are involved in the extraction and supply of oil and gas products used throughout the economy. With the renaming to 'Energy', companies involved in renewable energy will also be included.

Activities relating to renewable energy include: the development, manufacture and/or installation of equipment (*eg* wind turbines); and the processing, production and distribution of biofuels.

Chapter 15

Section 3.1

The Core Reading relating to the following two indices in the FTSE UK Index Series has been updated and now reads as follows:

FTSE 350 Supersectors Indexes

Industry sector indexes derived from companies in the FTSE 100 and FTSE 250 indexes. The 350 Index constituents account for over 95 per cent of the total UK equity market.

FTSE All-Share Index

Represents 98-99% of UK market capitalisation; being an aggregation of the FTSE 100, FTSE 250 and FTSE Small Cap Indexes.

Section 3.2

The Core Reading relating to the DJIA has been updated and now reads as follows:

The Dow Jones Industrial Average, commonly known as the Dow Jones index, is made up of 30 shares. It is an unweighted index. It provides a quick guide to shares in the industrial sector, but it is not representative of the American equity market as a whole. It is of limited use as a true gauge of market performance. Nevertheless, it is very widely reported.

Section 4.1

This section has been extended and now finishes with the following text:

The FTSE Global Climate Index series

More recently FTSE has added the FTSE Global Climate Index series which is designed to reflect the performance of a global and diversified basket of securities where their weights are varied based on three types of climate-related analysis (carbon emissions, fossil fuel

reserves, and green revenues data). The index therefore incorporates both risks and opportunities associated with climate change and transition to a green economy.

Companies may be excluded from an index in this series on environmental or related grounds, *eg* those producing controversial munitions such as biological weapons. Those which are included are weighted according to their exposure to:

- risks associated with fossil fuel reserves ('stranded assets')
- risks associated with greenhouse gas (GHG) emissions
- opportunities associated with providing solutions to environmental challenges.

Section 6

This section has been generalised to cover not just property indices, but those issues concerned with indices of unlisted or illiquid assets. The introduction and subsequent Core Reading in this section now reads as follows:

There are two key problems encountered when constructing indices of unlisted or illiquid assets:

1. the lack of reliable and up-to-date price data
2. the heterogeneity of the assets included.

The root of the problem is therefore mainly a lack of reliable data on prices.

Obtaining price data

The production of reliable indices requires knowledge of the market prices of the constituents of the indices at frequent intervals. With unlisted or illiquid assets there may be a number of problems in obtaining such information, as illustrated below for property:

- **Each asset (*eg* property) may be unique and therefore not representative of the sector or asset class overall.**
- **The market value of an asset (*eg* a property) may only be known when the asset changes hands.**
- **Estimation of value is a subjective and expensive process.**
- **Valuations may be carried out at different points in time, not necessarily at the time the index is calculated.**
- **Sales may be infrequent. Interim values for calculating the index would then need to be estimated or determined by a suitable valuation expert.**
- **The prices agreed between buyers and sellers of some assets (*eg* properties) are normally treated with a degree of confidentiality.**

Heterogeneity in price data

The heterogeneity of property magnifies the problems of obtaining price data. It is difficult to group properties into usefully homogeneous groups and still obtain sufficient price data for each group.

Other types of unlisted assets may have similar problems if they are very heterogeneous. On the other hand, some kinds of unlisted assets, like private equity investments, may be easier to value by using comparisons with easy-to-obtain listed equivalents.

The Chapter 15 summary pages have been updated to reflect the above changes.

Chapter 17

A new sub-section has been appended to the end of Section 1. This sub-section consists entirely of new Core Reading and is entitled '1.3 Backward looking *vs* forward looking'. The content of this new section is as follows:

A criticism of methods which use historical data is how applicable these might be in future. As suggested above, portfolio composition may change over time, but the riskiness of entire industries or countries can change over time. New risks may come into existence (or gain much higher recognition than before) which may make reliance on backward-looking measures questionable. For example, climate risks have more recently taken on greater emphasis in investment processes and policy setting. While these risks have existed for some time, they were largely unmeasured and unmanaged in the past so there would be no useful body of data to compare historical portfolios or to gauge how managers might incorporate and respond to them.

Nevertheless, the ease of use of historical measures, as well as their relative objectivity, means they are likely to remain a key method of assessing and monitoring risk going forward.

Chapters 18 & 19

The syllabus objective relating to asset / liability mismatch has been moved from Chapter 18 to Chapter 19.

In Chapter 19, the title of Section 3 has become 'ALM Example: Asset / liability mismatch reserving'.

Chapter 20

The Core Reading paragraph at the end of Section 2.2 has been deleted (as its content was duplicated in Section 2.1).

The ActEd text in Section 2.1 relating to longevity swaps has been adjusted to read as follows:

Longevity swaps exchange known ('fixed') payments (*eg* expected payments to annuitants assuming national population mortality) in return for uncertain ('floating') payments (*eg* actual payments to annuitants). Larger pension schemes may be able to arrange a longevity swap with an insurance company where the payments are linked to the mortality experience of the scheme's membership rather than the national population.

Similarly, *longevity insurance* policies exchange fixed payments (*eg* annuity 'premiums') in return for floating payments (*eg* annuity 'claims').

Another tool that can help manage longevity risk is a *longevity bond.* Such a bond pays coupons in proportion to the number of survivors in a selected birth cohort, based on mortality of the national population, for example survivorship of individuals turning sixty-five in the year that the bond is issued. Since this payoff approximately matches the liability of annuity providers, these bonds can be used to create an effective hedge against longevity risk.

Chapter 21

The following has been appended to the list of alternatives to government bonds in Section 3.7:

- **Green bonds (funding projects with environmental and/or climate benefits, *eg* renewable energy).**

Chapter 24

Section 1.1

The two Core Reading lists in this section have been updated and now read as follows:

Factors that need to be considered are:

- **the total rate of tax on an investment**
- **how the tax is split between different components of the investment return (typically income and capital gains)**
- **the timing of tax payments**
- **whether the tax is deducted at source or has to be paid subsequently**
- **the extent to which tax deducted at source can be reclaimed by the investor**
- **to what extent losses or gains can be aggregated between different investments or over different time periods for tax purposes.**

These factors will be affected by:

- **the overall tax system, *eg* tax rates and exemptions**
- **particular tax rules for individual types of asset**
- **the investor's own status (for example, an individual or a particular type of institution)**
- **the investor's financial position (which may affect the average or marginal rate of tax and any free-of-tax allowances)**
- **whether the investments are held domestically or offshore (and hence subject to another jurisdiction's rules and/or different taxation compared with similar local investments including the operation of any double-taxation treaties), and**
- **the tax-efficiency of the vehicle used to hold the assets.**

The Chapter 24 summary pages have been updated to reflect the above changes.

3 Changes to the X Assignments

Overall

A number of minor changes have been made throughout the assignments, including changes to mark allocations.

In addition, some changes have been made to reflect how examiners are responding to the shift to exams being 'open book' and administered online (*eg* fewer 'pure bookwork' questions).

The most significant change that has been made to the assignments reflects changes to the syllabus, and that is described below.

Assignment X2

Question X2.6(i) has been removed to reflect the removal of trust law from the syllabus.

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4 Other tuition services

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

4.1 Study material

We also offer the following study material in Subject SP5:

- Flashcards
- Revision Notes
- ASET (ActEd Solutions with Exam Technique) and Mini-ASET
- 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**.

4.2 Tutorials

We offer the following (face-to-face and/or online) tutorials in Subject SP5:

- a set of Regular Tutorials (lasting three full days)
- a Block (or Split 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**.

4.3 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**.

4.4 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 **SP5@bpp.com**.

2 The application of behavioural finance

2.1 Overview

Behavioural finance can have major implications for the way that market prices are formed both theoretically and in practice.

It is therefore important to have a broad grasp of the concepts underlying behavioural finance and how it differs from other areas of finance. What is usually termed 'modern financial economics' is based on the premise that participants (agents) in the markets are rational.

Question

List some attributes that would be consistent with 'rational' investing.

Solution

'Rational' investing may be characterised as:

- basing every decision on maximising wealth
- trading extra return with extra risk, where risk is volatility of future returns
- being fully informed on all potential investments
- being able to spread portfolios over a large number of investments without incurring excessive costs
- continuously reviewing all existing investments as well as reviewing potential new investments.

(*There are probably many more that you may have thought about*.)

Rationality

In technical terms 'rationality' means that when they receive new information agents update their beliefs correctly in line with Bayes' law and that they act to maximise their Subjective Expected Utility over time (see, for example, Barberis and Thaler, 2003).

If agents are all rational, we can conclude that the price of a security should equal its fundamental value and incorporate available news so market prices can be taken as a measure of fair value. This is an enormously important result that is the basis for most financial theory particularly the efficient markets hypothesis. However, many practitioners doubt that *every* participant in the market is always rational. Historically this was not considered a major theoretical difficulty as prices were considered to be set by informed agents who were rational.

This means that, so long as there are sufficient investors who manage large sums of money, and who do act rationally, it is not necessary in liquid markets to assume that every investor acts rationally. The weight of money managed by professional investors would be sufficient to take advantage of any perceived market anomaly. Market anomalies would therefore disappear.

Basically, if prices deviated from the 'correct' value the most informed agents could make money from this and in the process move prices back to appropriate levels. So, for example, if irrational agents were overly pessimistic about the value of HSBC shares valuing them at 400p instead of a true value of 600p, rational agents could make money by buying the shares until they reached the correct price of 600p.

Noise traders

A noise trader is someone that is heavily influenced by short-term noise (such as a news article, or another trader's opinion) and trade on that basis, ignoring other information and share fundamentals. They create volatility, and often generate a herd mentality which can push prices further and further from the theoretical 'rational' price.

Behavioural finance Is however not a certain route to profits. Even if an agent is sure that the market price of a security is incorrect it may be very risky to try to take advantage of this as irrational agents (known as 'noise traders') may make prices even more irrational in the short term. As the famous economist John Maynard Keynes commented, "markets can stay irrational longer than you can remain solvent."

The theory referred to above is built on the fact that, even if a rational investor has correctly assessed the price of a share, noise traders can push the price further in the wrong direction that investors would naturally think, making the rational investor's decision go horribly wrong in the short term. Without having the ability to cruise through the short-term losses and wait for the rational price to be achieved (a luxury that many institutional investors do not have) rational investors stay in the side lines.

Research on behavioural finance and its applications

Currently behavioural finance is a very active area of finance research. However, its theory and findings are more fragmented than other parts of financial economics because there are many possible explanations why prices might deviate from 'pure rationality', in each case driven by agents acting with some behavioural bias.

Behavioural finance has practical applications in providing broad guidance about how markets function (justifying these due to behavioural biases) and also in potentially predicting specific areas of mispricing based on quite specific anomalies.

Key findings from the research on behavioural finance can be divided into those relating to:

- overall, high level (macro) market behaviour
- the cross-sectional behaviour of securities
- collective-mood based anomalies
- the behaviour of individuals.

Each of these potential classifications is explored further in the sections that follow.

2.2 Market behaviour at a macro level

If we firstly deal with broad issues of market behaviour at a very high level perhaps the most celebrated work is that by Nobel prize winner Robert Shiller. In a series of papers Shiller argued that the volatility of stock prices is much greater than can be explained by rational models discounting the value of the dividends payable by the stocks (Shiller, 2003). This implies that stocks may be undervalued or overvalued relative to their price calculated by purely rational criteria.

Sentiment

Following an important paper by Baker and Wurgler there is now a great deal of interest in the role of sentiment in markets (Baker and Wurgler, 2006).

Investor sentiment is not an easy concept to define or measure precisely but has often been apparent in markets and recognised as important by practitioners.

A recent example of a period of very high sentiment would be the internet stock bubble in 1999-2000.

Research shows that the performance of stocks with different characteristics depends considerably on sentiment. In particular, when sentiment is low this has empirically been followed by high future returns on:

- **small stocks**
- **highly volatile stocks**
- **the stocks of unprofitable companies**
- **non-dividend paying stocks**
- **extremely high growth stocks**
- **distressed stocks.**

High future returns would be expected because the prices of these stocks would be very low when sentiment is low.

In contrast, when sentiment is high these patterns may reduce or reverse.

A number of quantitative measures have been used as proxies to measure sentiment including:

- **the average discount on closed-end funds**

  The 'discount' referred to here is the difference between the theoretical value of a trust as assessed by its net asset value per shares, and the actual market price.

- **share turnover**
- **the level and pricing of activity in the IPO market**
- **the level of issue of new equity**
- **the level of the dividend premium, which is a proxy for the relative demand for dividend payers among investors.**

Question

When sentiment is high, what would you expect to observe with respect to the discount on investment trusts, share turnover, IPO activity and the demand for high dividend paying shares?

Solution

We would expect the discount to narrow. Investors are positive on the future and searching for investments. If investment trusts stand at a discount, they may be purchased as investment opportunities, narrowing the discount to NAV.

As investors search for opportunities, buying and selling investments, we would expect turnover to rise.

If there is high demand from investors, those aiming to raise cash will take advantage of this fact, and issue new companies (IPOs) or shares in existing companies (rights issues) whenever possible.

High dividend paying shares are often called 'value' shares. Such shares generally do not fall very far in difficult times, and are therefore very popular when sentiment is poor. When sentiment is high, we would expect less demand for these shares are investors search for more risky, higher-growth opportunities for their cash.

By observing these features, researchers can assess whether the stock market was in positive or negative mood during particular periods in the past. They can then allocate certain observed behaviours as belonging to these market environments.

By doing this, it is observed that when sentiment is high, it has generally been good to invest in small shares, volatile shares, *etc*. Of course many items of research on such matters can be criticised as data mining.

Herding

Herding is a concept which has received a lot of research attention (see Bikhchandani and Sharma, 2000). In simple terms this is when investors make decisions based on what they observe other investors to be doing. Thus they buy or sell because others are buying or selling. This should be clearly distinguished from the situation where many investors do the same thing without reference to one another (spurious herding), for example, as a result of a major adverse economic news announcement causing many investors to rationally sell equities.

It is commonly considered that as a result of the current low interest rate environment, many herding investors are borrowing to buy second or third residential properties as rental homes. This is 'spurious herding' because the investors are acting rationally based on the economic environment rather than blindly following the actions of others (although some are probably blindly following others!)

However, it still results in circumstances where investors are all facing the same way, and acting in the same way.

Herding is potentially bad for financial markets as it may increase volatility and possibly even threaten the integrity of the whole system if markets are driven to extremes.

There are a number of explanations for herding including:

- **the idea that investors may copy other investors that they perceive to be better informed about a particular situation (*ie* following the experts)**
- **the incentives facing fund managers (for example, keeping close to a peer group or the idea that if every manager performs equally badly you are unlikely to be sacked)**
- **fear of missing out; or**
- **an intrinsic desire to conform.**

This is linked to 'regret aversion' that was mentioned earlier. If a decision to be different may involve a great deal of regret if it goes wrong, then the decision is avoided.

There is some evidence that investment analysts are prone to herding behaviour in their predictions. Herding is rather difficult to measure directly as it is hard to know an individual's true motives for an investment decision or research recommendation although a number of papers have developed quantitative measures to try to proxy it. Generally there is some evidence of herding amongst investment managers and this is more pronounced

- **in times of financial stress**
- **in less developed markets.**

2.3 The cross-sectional behaviour of stocks and other securities

A number of studies have looked at the cross-section of stock returns (that is, the pattern of returns for different securities over the same time period). A classic paper by DeBondt and Thaler (1985) examined all stocks traded on the NYSE and ranked them by their past cumulative returns over the previous three years. They found that the average returns over the next three years of a portfolio formed from the worst performing stocks were almost 8% *pa* higher than those of a portfolio formed from the best performing stocks. They interpreted this as evidence of stock-market over-reaction (here that 'oversold' stocks would subsequently recover faster than the overall market).

A number of factors have been put forward to explain aspects of cross-sectional stock returns. Many of these factors have a long history of being used in the markets. It has been and continues to be strongly debated whether they result from behavioural factors or are in fact a rational response to other factors such as risk. The size factor for example has been shown to be quite predictive with the stocks of small companies tending to outperform those of larger ones. Similarly, 'value stocks' (those with relatively high book to market values or low price-to-earnings ratios) have been shown to outperform in numerous studies over longer periods of time.

As mentioned earlier, small stocks tend to outperform in recovery situations when sentiment has been low (and prices are depressed) and then subsequently recovers. Whereas value stocks with low PE ratios tend to outperform when sentiment is low and falling.

Question

Define the 'book to price' ratio and state why value stocks have high book to price ratios.

Solution

The book to price ratio is defined as $\frac{\text{net asset value per share}}{\text{market price}}$ and is often less than one. Net asset value per share, or NAVps is defined as $\frac{\text{share cap and reserves} - \text{intangibles}}{\text{number of shares}}$.

Value stocks are often those with sound but unexciting fundamentals, where the market price drops as investors search for more exciting shares to invest in. As these shares have sound fundamentals, the accounts tend to show a high level of shareholder reserves, indicating that the company has plenty of non-current assets and not much debt. But if the share is unexciting, the market price will fall to low levels creating a high book to price ratio relative to other shares.

Cross-sectional momentum

Another influential study by Jegadeesh and Titman (1993) shows that what is termed cross-sectional momentum may be an important factor in predicting stock market returns. They grouped all stocks traded on the NYSE by return and showed that the decile group that had performed worst over the last six months performed substantially worse than the group of the best performers over the next six months. Thus, there was a cross-sectional momentum effect with relatively poor performing stocks continuing to perform poorly and well-performing stocks continuing to perform well.

Time series momentum

What is termed a time series momentum effect has also been documented where the past performance of many financial instruments, including equity indexes, currencies, commodities, and sovereign bonds is considered in isolation rather than relative to other instruments. The past 12-month excess return of many instruments has been found to be a positive predictor of their future return over roughly the next year (Moskowitz et al, 2012).

So research has shown that:

- market over-reaction is clearly evident in markets, so investors should buy shares that have underperformed, waiting for the market recovery
- in the short term, momentum effects are evident in markets, so investors should buy shares that are outperforming as this outperformance will continue.

Clearly it is difficult to come to a clear theory that investors can use for portfolio decisions. Much depends on the market and economic environment as to which behaviours will dominate, and much will depend on what is considered 'short-term' and what is considered 'long-term'.

A feature of the work on the cross-section of stock returns is that, whilst most academics and practitioners agree on the empirical facts regarding return patterns, the underlying reasons for the patterns are much more controversial and very difficult to totally pin down. Whilst many experts think behavioural explanations are the most plausible, others advocate rational causes such as higher returns being a reward for risk. The work by the academics Eugene Fama and Kenneth French tends towards the latter view but they merit coverage even in a section devoted to behavioural finance for their ongoing and extremely influential work on quantifying, documenting and modelling factors affecting the cross-section of stock returns (see, for example, Fama and French, 1992).

2.4 Particular mood-based anomalies

Numerous studies that have found market anomalies that seem plausibly explained by behavioural factors. Many of these sit rather uncomfortably with general theory but potentially could/should be taken account of in trading. In many cases the rationale is that the psychology literature shows that emotions and mood influence human decision-making with good moods being associated with more positive evaluation and a tendency to make more positive choices.

Some of the particularly striking examples amongst the numerous examples of such anomalies are mentioned below:

- **Calendar Effects – 'Blue Mondays' and Good Returns Pre-holidays. There is considerable literature examining a link between dates and market returns. Returns have often been found to be low on Mondays and high on the days immediately before Public Holidays.**
- **Sunshine – Daily market returns in world markets have been found to be correlated with the amount of morning sunshine in the city of the country's leading stock exchange (Hirshleifer and Shumway, 2003).**
- **Sports Results – A correlation has been found between national sports team losses and declines in the stock market of that country (Edmans et al, 2007).**
- **Aviation disasters have been shown to lead to losses of stock market value which are a large multiple of the estimated actual economic losses from the disaster itself. A finding presumably due to induced negative sentiment (Kaplanski and Levy, 2010).**

2.5 The behaviour of individuals

Studies have been conducted on the way individuals can be expected to behave based on theory from psychology and also on the way they actually do behave when their actions can be observed. These findings have potential implications for the markets.

Numerous findings show that individuals may not act as fully rational economic agents attempting to maximise their utility. One of the most celebrated departures from conventional rationality is described by Prospect theory which was described earlier.

Question

Outline 'prospect theory' in general terms.

Solution

Prospect theory indicates that:

- when faced with potential gains, investors are generally risk-averse
- when faced with potential losses, investors can become risk-seeking.

This theory has many important implications and has been extensively employed in behavioural finance. In the simplest terms the theory models the fact that people experience greater disutility from a loss than positive utility from the same sized gain. This implies that decisions may be driven by anticipated gains and losses – *ie* the *path* of investment returns – rather than by final wealth.

The study of prospect theory has uncovered a number of features. The most commonly understood is that a person's utility function for gains tends to be risk-averse, and the utility function for losses can be risk-seeking. However, there are some other outcomes, including the fact that the utility function for losses is much steeper than the utility function for gains. In other words people detest losses, but only modestly like gains from their current wealth situation.

Another outcome is that small probability events are generally over-estimated, such that an event that has a 1% chance of happening may be perceived in the mind as having a 2% or even a 5% chance of happening. However, when probabilities rise towards the certain, the weights applied by people are less than they are in reality.

The theory is an important one for explaining the success of insurance, where a person is expected to part with a small premium (say £10) to insure against an unlikely event (say a 1% chance of losing £500). In mathematical terms, the insurance does not seem to make sense. But if the person making the decision applies a 5% chance to the event occurring, then the insurance does make financial sense from a utility perspective. However, ask someone to pay £85 to insure against a 90% chance of losing £100, and you are unlikely to sell many products.

2.6 Direct investigation of individuals' trades and portfolios

A body of research has investigated the trades and portfolios of stock market participants to find direct evidence of their behaviour. Brad Barber and Terrance Odean were pioneers in this area and produced some seminal papers by investigating the trades made by the customers of a large brokerage house. They found that individuals trade too much, falsely believing they can pick winners, whereas they are actually losing money because of trading costs and poor trades (Barber and Odean, 2000). This activity is consistent with overconfidence.

In a later study they find that men trade significantly more than women which is consistent with research in psychology showing that men tend to be more overconfident (Barber and Odean, 2001).

Odean has also shown that individuals are prone to irrationally realise the profits of winning as opposed to losing trades, a finding known as the disposition effect which is closely related to Prospect theory (Odean, 1998).

So when an investor has made an unrealised gain, there is a tendency to realise it and bank the cash. Whereas when an investor has made an unrealised loss, there is a tendency to hold on to the investment, and 'gamble' it in order to reduce the loss. This is similar to prospects theory, which says that investors are generally risk-averse with their gains, and risk-seeking with losses. Many behavioural themes overlap, making it a difficult area to develop useable theorems, or even to classify observations. It is not for the more scientific of actuarial students.

Work on the portfolios of investors has shown that individuals tend to hold portfolios that may be far from the optimum and may use inefficient means of diversification. One study found that US investors hold under-diversified portfolios and the problem is worse for younger, low-income, less-educated and less-sophisticated investors. This lack of diversification seems consistent with a number of behavioural biases (Goetzmann and Kumar, 2008). There is evidence from US pension plan data that individual investors use very naive methods of investing including often simply using a '1/N rule' where they simply divide their funds equally between the N funds available to them (Benartzi and Thaler, 2001).

Question

State a possible reason why individual investors invest their money in (say) 30 equal amounts rather than a more sophisticated approach.

Solution

There are a number of possible reasons for this, including the following:

- Individual investors do not have access to the research that institutional investors have. They trust that institutional investors keep the market relatively efficient. Of the two decisions to be made (which 30 shares to select, and how much to invest in each) the first of these is considered to be more important than the second, therefore equal amounts are invested.
- Individual investors who don't trade very much and tend to 'buy and hold' have a habit of waiting until their savings cash, or pension cash, reaches a certain amount (say £10k) and then investing it. This will result in a fixed number of investments of approximately the same amount.
- Individual investors invest more heavily in large cap shares. The size of these companies is extremely large in all cases, and the investor's holdings in each share is almost infinitesimally small. Tapering the proportion of each investment may seem pointless.

2.7 Discussion and conclusions

The literature on behavioural finance is very extensive and the evidence supporting many of its findings is persuasive. This means it is important that practitioners are not ignorant of this work and its potential implications.

This section has briefly introduced some of the most important findings from the area but is far from comprehensive. Indeed one of the problems with behavioural finance is that it is difficult to distil the findings down to a small number of general theories.

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