INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2019 Examinations

Subject SP5 – Investment and Finance Specialist Principles

Introduction

The Examiners' Report is written by the Chief Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and using past papers as a revision aid and also those who have previously failed the subject.

The Examiners are charged by Council with examining the published syllabus. The Examiners have access to the Core Reading, which is designed to interpret the syllabus, and will generally base questions around it but are not required to examine the content of Core Reading specifically or exclusively.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit. For essay-style questions, particularly the open-ended questions in the later subjects, the report may contain more points than the Examiners will expect from a solution that scores full marks.

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision

Mike Hammer
Chair of the Board of Examiners
July 2019

A. General comments on the *aims of this subject and how it is marked*

1. The aim of this Investment and Finance Principles subject is to instil in successful candidates the ability to apply, in simple situations, the principles of actuarial planning and control to the appraisal of investments, and to the selection and management of investments appropriate to the needs of investors.

2. A mix of questions styles is used, covering *knowledge* of the material set out in Core Reading, *application* of this in calculations and case studies and *higher order skills* such as synthesis and collation of recommendations. Marks are awarded for the constituent elements of calculations, not just for the final answer generated. Scenario appraisal will similarly provide credit for evidence of the issues considered, not solely for the conclusions reached.

3. Candidates who give well-reasoned points, not in the marking schedule, are awarded marks for doing so.

4. The examiners want to test the understanding of the candidates in relation to the principles of investment. In order to do that the candidates will be asked to demonstrate that they know how investors might behave and what various terms mean. It also requires candidates to calculate and interpret certain investment related figures. It is not expected that the candidates are experts in the investment area, however they should have an overall understanding of investment markets and the function and needs of the various parties involved.

B. Comments on *student performance in this diet of the examination*

Candidates often picked up marks relating to knowledge and calculation, however they often struggled to demonstrate an understanding of how investment markets work.

Generally speaking candidates had sufficient time to make an attempt at all questions, though some seemed to make life difficult for themselves by giving more information than was asked for, this was particularly the case for Q3 (iii). Candidates are urged to read the question and answer accordingly.

The paper proved harder than the Examiners had expected. Assessing the minimally competent candidates a pass mark of 54 was deemed appropriate. The pass mark was then scaled to 55 and candidates awarded an upward adjustment.

C. Pass Mark

The Pass Mark for this exam was 55%

Solutions

Q1

(i) <u>The loan itself:</u>

What is Coffee Company going to do with the money they raise? [½]
When is payback expected of the debt the Coffee Company is raising? [½]
What is the expected source of repayment for the Coffee Company? [½]
Is there a secondary source? [½]
Are there any plans to refinance the loan at a later date? [½]
Where will the debt rank compared to the company's other debt? [½]
What risks (quantitative and qualitative) could jeopardise the Coffee Company's debt servicing in future? [½]

<u>Industry analysis and competitive trends of Coffee companies</u>

Health issues – is coffee detrimental to heath? [½]
Market Saturation – are there too many beverage outlets? [½]
Competition from other beverages [½]
Regulatory environment for retail outlets [½]
Sovereign macro-economic analysis, outlook for the country's economy [½]
Potential legislation/tax changes [½]
Outlook for coffee market [½]

<u>Coffee Company specific issues:</u>

Overall financial performance including: [½]
Analysis of profitability [½]
Analysis of capital structure e.g. gearing [½]
Analysis of cash flow e.g. income cover [½]
Does the Coffee Company's bond structure reflect the risks and protect investors' interests (structure, status, safeguards, pricing)? [½]
Past performance [½]
Quality of product/outlets [½]
Market position – premium/downmarket [½]
Leasehold/freehold property [½]
Geographic spread [½]
Management track record/ability [½]
Forward looking analysis, prospects for the business [½]
Possible future corporate activity [½]

[Max 9]

(ii)(a) Rationale for Coffee Company raising capital thorough public markets:

- Better terms realised in raising capital through the public corporate debt market including cheaper way of raising capital [½]
- and less restrictions placed on Coffee Company from the lender (i.e. covenants, board seats, relinquishing part of control) [½]
- Cheaper than equity/equity unavailable [½]
- Bank finance too expensive/unavailable [½]
- May be tax benefits [½]

(b)

- Coffee company will be more successfully able to raise funds if a credit rating is maintained with a recognised ratings agency [½]
- Greater variety of borrowers through widened scope and more competitive offering available for Coffee company [1]
- A credit rating may result in an improved reputation among investors and possibly customers. [½]
- Coffee company has then the ability to raise greater levels of funds [½]
- Legislative requirement [½]

[Max 3]

[Total 12]

Marks were also given for other relevant points

This was reasonably well answered, in part (i) most candidates commented on the financial performance – cash flow, gearing etc., less mentioned the actual market in which Coffee Company were operating. In part (ii) most candidates scored well.

Q2

(i) Strategy 1: using equity index futures – sell US equity futures and buy emerging markets futures. [½]
The steps to follow would be to identify the futures contract that best tracks the emerging markets of interest and buy and sell a number of futures contracts whose exposure is equivalent to the amount of stock needed to be bought and sold. [½]
Margin would be required as the underlying markets move and the position would need to be rolled forward if needed longer term. [½]
Strategy 2: using Total Return Swaps (TRS). Swaps are agreements between two counterparties to exchange one stream of cash flows against another, here the returns on the US and emerging markets equity markets. [½]
A TRS is a bespoke arrangement, usually with an investment bank and can be customised and tailored to the investment fund's needs. Here an agreement would be needed on the form and frequency of the cashflows to be exchanged. [½]

[Max 2]

(ii) <u>Physical assets</u>
Advantages:

- Simple to explain and does not require any extra expertise [½]

Disadvantages:

- The process of buying and selling the physical assets requires a lot of time and resource to co-ordinate the different fund managers. [½]
- Market capacity could limit the size of assets that could be transacted, [½]
- Trying to buy and sell the stocks aggressively could disrupt the price such that poor prices are obtained. [½]

- This could be a particular problem in purchasing emerging market equity of they are less marketable and trading infrequent. [½]
- This strategy will also be expensive – two sets of commissions and two spreads to be paid. [½]
- There is also the possibility of the crystallisation of capital gains leading to a tax liability. [½]

<u>Total Return Swap & Futures compared physical assets</u>

Advantages:

- These instruments can provide the market exposure with little or no upfront cash commitment, i.e. there is a low cost of implementing these synthetic strategies.[½]

  Disadvantages:
- Regulation/Mandate may not allow or may limit exposure. [½]
- Liquidity risk – regular payments will be made/received so sufficient liquid resources need to be available. [½]
- Both these instruments will require suitable expertise to set up and monitor. [½]

<u>Total Return Swap compared to Future</u>

<u>Futures</u>

Advantages:

- Lower counterparty risk as trades are conducted through an exchange which will have an AAA credit rating. [½]
- One of the most important advantages of using futures contracts relates to the impact of tax on dividends. [½]
- Index futures receive dividends indirectly since the price should reflect the value of future dividends expected to be paid. [½]
- In contrast, investors holding foreign stocks such as in the emerging markets generally cannot recover the full amount of taxes paid on those stocks [½]
- The position can be implemented immediately and the futures market is very liquid – this means there is little risk of price drag. [½]
- Using futures gives the investment fund time to construct and execute the buy/sell programs. [½]
- As more stock is bought (sold) so the requisite number of futures can be sold (bought back). [½]
- If the decision is a tactical one, the positions can be more easily and cheaply reversed out without harming the underlying stock portfolios. [½]

Disadvantages

- Roll over risk – the futures contracts will expire and if continued exposure is required they will need to be rolled over, thus giving rise to re-investment risk [½]
- Cross Hedging risk – the future may not exactly reflect the assets being sold or that were potentially being purchased and therefore the underlying assets and the future may move differently. [½]
- Basis risk- the price of the future may move differently to the index it was designed to follow. [½]
- There may not be a suitable future, this is particularly the case for the emerging market. [½]

<u>Total Return Swap</u>

Advantages:

- The TRS is customisable as it is a bespoke agreement with another institution. [½]

Disadvantages:

- Counter party risk, as this is a bespoke arrangement with a counterparty there is counterparty risk, this is minimised by making/receiving regular margin payments. [½]
- Requires an ISDA, this will require legal expertise. [½]
- May not be possible to find a suitable third party. [½]

[Max 6]

(iii) With either a future or a swap there is a greater counterparty risk, e.g. with a bank in a swap or the clearing house for futures, [½]
although this is reduced through collateral. [½]
This introduces a liquidity risk as collateral may flow to the other party thus requiring some liquid assets to be held. [½]
Using derivatives can add complexity through structuring and pricing and assessing counterparty creditworthiness. [½]
When using futures the main risks are:

- Cross Hedging i.e, the future is not an exact match for the exposure required and therefore does not move in the same way. [½]
- Therefore the futures position may underperform the underlying index [½]
- Basis risk even if the future is exactly matched to the economic exposure required the return produced by the future may not exactly match that of the underlying asset/index [½]
- e.g. through roll forward costs or changes in dividend yields / interest rates. [½]

When using a TRS the main risks are:

- The valuation of the swap can be more difficult or prone to error than the physical assets. [½]
- Liquidity can be reduced with a TRS because it is a direct agreement between two parties, although liquidity is generally very good in the futures market. [½]
- It may not be possible to find a counterparty willing to engage in the required swap, or the counterparty may not offer the precise bundle of securities in the swap. [½]
- It may be difficult to reverse the position by cancelling swap if counterparty unwilling or unable to do so. [½]

[Max 4]

[Total 12]

Again this was one of the better answered questions. Part (ii) produced the best answers. In the event that the correct answer to part (iii) was given in part (ii), or vice versa, the appropriate marks were awarded.

Q3

(i) The field of behavioural finance looks at how a variety of mental biases and decision-making errors affect financial decisions. [½]
It relates to the psychology that underlies and drives financial decision-making behaviour. [½]
And how investors are influenced by behavioural biases [½]
This may be used to predict how investors will behave. [½]
[Total 2]

(ii) People base perceptions on limited past experience of similar events i.e. depending on the age of the individual some may recall the last time the property market fell, i.e. familiarity. [½]
People dislike 'negative' events – the degree to which an outcome is considered as negative or positive has an enormous influence on the probability estimates of its likely occurrence i.e. they may have a vested interest in the property market remaining stable and don't believe that it could happen [½]
Representative heuristics – people find more probable events which they find easier to imagine [½]
Availability – people are influenced by the ease with which something can be brought to mind. This can lead to biased judgements when examples of adverse events are inherently more difficult to imagine than examples of more positive outcomes [½]
[Total 2]

(iii) *Students can only get marks for the first behaviour they identify (assuming it is correct) for each part.*

a) Either:
<u>Regret aversion</u> – [1]
Which is where the trustees have avoided making a decision which may cause them to later regret the decision. [½]
The trustees may be unwilling to move adviser because of the fear that they won't be as good as the current adviser and will regret the decision. [½]
Or:
<u>Status Quo</u> [1]
An unwillingness to change [½]
With the status quo being preferred. [½]

b) Either:
<u>Anchoring and adjustment</u> [1]
This suggests that when estimating a value for equity returns, the trustees are influenced by some 'anchor' [½]
Which is provided in past performance and in expert opinion. [½]
Or:
<u>Regret Aversion</u> [1]
The trustees will regret not increasing their equity position if the market continues to rise [½]
Especially as market commentators had predicted this rise. [½]
Or:
<u>Overconfidence</u> [1]

The trustees have placed too much confidence in the market commentators. [½]
This may have caused them to ignore metrics showing how expensive the market is or other similar negative influences. [½]

c) Either:
Overconfidence [1]
Managers can be often more confident in their ability to predict an uncertain future than they should be. [½]
This could cause them to ignore other views from expert advice or market peers. [½]

Or:
Confirmation bias [1]
The trader has ignored the negative articles [½]
And concentrated on information that supports a more positive view. [½]

d) Either:
Confirmation bias [1]
People will tend to look for evidence that confirms their point of view (and will tend to dismiss evidence that does not justify it. [½]
In the case of government bond yields, the trustees have dismissed the possibility of yields falling further because of market views and the fact that they have never fallen to that level before makes it less likely to occur. [½]
Or:
Regret aversion [1]
The trustees are worried they will regret making these investments if interest rates rise. [½]
Especially as they have been told that interest rates are at 'all time lows'. [½]
Or:
Status Quo [1]
The trustees prefer to do nothing [½]
With the status quo being preferred. [½]

e) Hindsight bias [1]
The investment consultant is commenting after the event reasons why the hedge fund strategy did not deliver based on historic data [½]
I.e. re-evaluating past evidence to provide justification that the failure of the strategy was predictable. [½]
[Max 10]

[Total 14]

The answers to this question showed the greatest variability, while a number of candidates collected the maximum marks others performed less well. Part (iii) asked candidates to name the ***main*** *behaviour being exhibited, a significant number of candidates named a number of possible answers which wasted time and didn't gain any extra marks.*

Q4

(i) Commodities offer significant real returns that are produced by doing real economic work within the economy. [½]
There can also be the potential for higher returns, possibly from increased beta/greater cyclicality, market inefficiencies, pricing anomalies or the skill in selection / management of the investor. [½]
The returns accrue to the long-only investor without the need for active management. [½]

Commodities offer a package of diversification benefits unlike any other asset: [½]

- due to a lack of correlation with existing assets or [½]
- by exposure to underlying risks that are uncorrelated [½]
- so reducing the overall portfolio risk. [½]

[Max 3]

(ii) Invest in the underlying commodity (or basket of commodities) [½]
Commodity derivatives (on either single commodities or an index) [½]
Invest in companies whose share price is influenced by commodity prices (such as oil and mining companies). [½]
Invest in a fund offered by an investment manager, this could be a specialist commodity fund, an ETF, or some other collective vehicle. [½]

[Total 2]

(iii) <u>Direct Investment</u>

Advantages

- Simple to explain. [½]
- It provides diversification. [½]
- No counterparty risk. [½]

Disadvantages

- Storage/transport fees may be payable. [½]
- The commodity may rot. [½]
- It may not be a liquid market. [½]
- Investing in the commodity requires management costs and skill. [½]

<u>Derivatives</u>

Advantages

- It may be a more liquid market. [½]
- Providing the derivative is not to maturity there is no need to take delivery of the commodity. [½]
- Possible cheaper to transact [½]

Disadvantages

- Margin payments may be required therefore some liquidity is required. [½]
- There may be basis or cross hedging risk. [½]
- A suitable derivative may not exist [½]
- Requires expertise [½]

<u>Company equity</u>

Advantages

- The company management will be experts in their particular commodity. [½]

- Should be marketable. [½]

Disadvantages

- The equity price will be affected by factors other than the commodity price. The prices will be less uncorrelated with the equity markets. [½]
- Companies typically invest in a number of commodities so the required exposure may not be available. [½]
- Companies may change their exposure over time, including hedging their exposure. [½]
- The companies will incur expenses which will dilute the return. [½]

<u>Commodity fund</u>

Advantages

- Investing in an investment management commodity fund can give access to specialist management. [½]
- The funds may be liquid and have small minimum investments. [½]
- The fees may be low if the investment is in an ETF. [½]

Disadvantages

- Depending on the type of fund management fees may be high e.g, specialist commodity hedge fund [½]
- There may not be a fund that provides the required exposure. [½]

[Max 5]

(iv) As the delivery period for a futures contract is approached, the futures price converges to the spot price of the underlying asset. [½]

When the delivery period is reached, the futures price is equal to (or very close to) the spot price. [½]

First suppose the futures price is above the spot price. A trader can then short a futures contract and buy the underlying and make delivery. [½]

This will lead to a profit equal to the amount that the futures price exceeds the spot price. [½]

As traders exploit this arbitrage opportunity, the futures price will fall. [½]

If the futures price is below the spot price, then anyone wishing to acquire the underlying asset could enter into a long futures contract and wait for delivery. [½]

As they do so the futures price would tend to rise. [½]

For commodities, such as gold, which are held as investments, no-arbitrage arguments can be used to show that the value of a future must be given by a formula as follows: [½]

Future price = spot price of underlying commodity + cost of carry. [½]

Here the cost of carry is the financing cost of holding the underlying commodity, plus storage costs. [½]

Because the cost of carry is positive, the futures price is normally above the spot price. [½]

The cost of carry reduces over time. [½]

This is known as a contango market. [½]

In rare cases gold has been in backwardation when the future price is less than the spot price, this implies a positive convenience yield for gold. [½]

This may imply there are uncertainties surrounding the production of gold or there are great economic, financial or political happening/likely to happen. [½]

[Max 5]

[Total 15]

This question produced the best answers and the lowest scoring answers, the average mark for part (ii) was over 80%, however the average mark for part (iv) was around 30%. Few candidates commented on the fact that when the delivery period for the future is reached the futures price is close to or equal to the spot price. Some could describe a contango market and what backwardation meant.

Q5

(i) Taxation of investment return is one of the major factors considered by investors in selecting investments. Each investor, individual or institution, will attempt to maximise after tax returns (subject of course to risk constraints) and will therefore attempt to find tax-efficient investments. Factors that need to be considered are:

- The total rate of tax on an investment [½]
- How the tax is split between different components of the investment return [½]
- The timing of tax payments [½]
- Whether the tax is deducted at source or has to be paid subsequently [½]
- The extent to which tax deducted at source can be reclaimed by the investor [½]
- To what extent losses or gains can be aggregated between different investments or over different time periods for tax purposes. [½]
- Whether or not there are any planned changes to the tax system – this may mean it is more beneficial to defer crystalizing gains or to bring them forward. [½]

These factors will be affected by:

- The overall tax system, e.g. tax rates and exemptions [½]
- Particular rules for individual types of asset [½]
- The investors own status (individual or particular type of institution) [½]
- The investor's financial position [½]
- The tax-efficiency of the vehicle used to hold the assets. [½]

[Max 4]

(ii) CGT is usually only payable when an asset is sold. By delaying the sale of the asset, the holder can defer (or maybe even eventually avoid) the CGT liability. [½]
Capital losses can usually be used to offset capital gains in the same year, hence lowering the CGT liability. [½]
Derivatives can be used to reduce exposure to an asset rather than selling the asset itself, thus delaying or avoiding the CGT liability [½]
If there is an annual tax-free allowance then investors can take advantage of this by selling the asset and realising any capital gain, before repurchasing the asset. The

CGT is covered by the allowance for that year and no tax is payable on that particular gain in future years (i.e. bed and breakfasting). [½]
Capital gains can be reduced by investing in vehicles designed to provide a high income with little or no capital gain. [½]
It may be possible to reduce CGT by changing country of residence. [½]
[Max 2]

(iii)

CGT on FI				
Redsident in A	Year 1	Year 2	Year 3	
Income tax	150	225	300	1/2 mark
CGT on Property A	-	-	-	
CGT on Property B	400	400	200	
CGT on Property C	- 100	- 100	200	
Total CGT on Property	300	300	400	
CGT on Art	50	50	100	1/2 mark
CGT on FI	400	400	200	
Total CGT	750	750	700	1/2 mark
Total tax	900	975	1,000	1 mark
				Total 2
Redsident in B	Year 1	Year 2	Year 3	
Income tax	250	375	500	1/2 mark
CGT on Property A	100	50	150	
CGT on Property B	-	-	-	
CGT on Property C	- 100	- 100	200	
Total CGT on Property	-	- 50	350	
CGT on Art	37.50	37.50	75.00	1/2 mark
CGT on FI	400	400	200	
Total CGT	438	388	625	1/2 mark
Total tax	687.5	762.5	1,125.0	1 mark
				Total 2
Redsident in C	Year 1	Year 2	Year 3	
Income tax	100	150	200	1/2 mark
CGT on Property A	100	50	150	
CGT on Property B	400	400	200	
CGT on Property C				
Total CGT on Property	500	450	350	
CGT on Art	-	-	-	1/2 mark
CGT on FI	400	400	200	
Total CGT	900	850	550	1/2 mark
Total tax	1,000	1,000	750	1 mark
				Total 2

No CGT on FI				
Redsident in A	Year 1	Year 2	Year 3	
Income tax	150	225	300	1/2 mark
CGT on Property A	-	-	-	
CGT on Property B	400	400	200	
CGT on Property C	- 100	- 100	200	
Total CGT on Property	300	300	400	
CGT on Art	50	50	100	1/2 mark
CGT on FI	-	-	-	
Total CGT	350	350	500	1/2 mark
Total tax	500	575	800	1 mark
				Total 2
Redsident in B	Year 1	Year 2	Year 3	
Income tax	250	375	500	1/2 mark
CGT on Property A	100	50	150	
CGT on Property B	-	-	-	
CGT on Property C	- 100	- 100	200	
Total CGT on Property	-	- 50	350	
CGT on Art	37.5	37.5	75.0	1/2 mark
CGT on FI	-	-	-	
Total CGT	37.5	-	425.00	1/2 mark
Total tax	287.5	375.00	925	1 mark
				Total 2
Redsident in C	Year 1	Year 2	Year 3	
Income tax	100	150	200	1/2 mark
CGT on Property A	100	50	150	
CGT on Property B	400	400	200	
CGT on Property C	-	-	-	
Total CGT on Property	500	450	350	
CGT on Art	-	-	-	1/2 mark
CGT on FI	-	-	-	
Total CGT	500	450	350	1/2 mark
Total tax	600	600	550	1 mark
				Total 2

NB For resident in B year 2, candidates may handle the CGT loss in year 2 in the following ways:

- Put as zero (as shown)
- Put as zero and use to offset the gain in year 3

(In year 3 CGT becomes 412.5 and total tax is 912.50)

[Max 6]

(iv) The investors would therefore have reduced their tax bill if they were resident in Country B [½]
Or Country C, [½]
With the lowest tax bill in Country B [1]

[Max 2]

[Total 14]

This was the best answered question on the paper. Candidates scored well in all three parts. In part (iii) the question did not state whether capital gains tax (CGT) was payable on the fixed interest investments and marks were awarded in both cases assuming candidates were consistent. Both solutions are given here.

Q6

(i) Over time, various external factors will impact industries in different ways. For example:

- Technological changes may cause an industry to experience an abrupt shift from growth to decline or vice versa. For example, the purchase of CDs have been disrupted by online streaming music services [1]
- Regulation or regulatory changes can also have a profound impact on the structure of an industry. [1]
- Social changes also have the ability to affect the profile of an industry, e.g. there has been a reduction in the use of tobacco projects over the last 20 years leading the tobacco industry to decline. [1]
- Demographics also play an important role. As the retired population expands, the industry demand for health care services is likely to increase. [1]

Trends in economic activity will also have a significant impact on the demand for an industry's products or services. [½]

These trends can be cyclical (related to changes in economic activity caused by the trade cycle) or structural (related to longer term changes in economic activity). [½]

Among the economic variables that usually affect an industry are the following:

- gross domestic product or the measure of the value of goods and services produced by an economy, either in current or constant currency (inflation-adjusted) terms; [½]
- interest rates, which represent the cost of debt to consumers and businesses and are important ingredients in financial institutions' revenues and costs; [½]
- the availability of credit, which affects business and consumer spending and financial solvency; and [½]
- Inflation, which reflects the changes in prices of goods and services and influences costs, interest rates, and consumer and business confidence. [½]
- Exchange rate, companies that import or export a large proportion of their output will be impacted by movements in currencies. [½]
- The tax rates that companies pay will impact their post tax profits and could influence their dividend distribution policies [½]
- Political, a government may nationalise or privatise an industry or possibly just specific companies. [½]

[Max 6]

(ii) <u>Uses</u>

- Industry classification allows an investor to understand a company's business and the business environment that it operates in. [½]
- This is helpful in stock selection and valuation because it provides insights into the growth opportunities available and the risks faced by that particular company. [½]
- For a credit analyst, this provides insights into the appropriateness of a company's use of debt financing and into its ability to meet its promised payments during economic contractions. [½]

- Investors taking a top-down investing approach use industry analysis to identify industries with positive, neutral, or negative outlooks for profitability and growth. [½]
- Generally, investors will then overweight / underweight those industries relative to their benchmark [½]
- Apart from security selection, some investors attempt to outperform their benchmarks by industry rotation, i.e. moving in to or out of industries by analysis of industry fundamentals and/or the economic cycle. [½]
- Performance attribution, which addresses the sources of a portfolio's returns usually in relation to the portfolio's benchmark, includes industry or sector selection. [½]
- Industry classification schemes play a role in such performance attribution.[½]
- The indices may be used to create derivatives. [½]
- The classification system allows investors evaluate short term industry returns. [½]
- And to measure historical performance [½]

<u>Limitations</u>

- The usefulness of the classification can be limited where there are so many subsectors within a particular sector, e.g. as noted above the FS sector contains a diverse mix of investment characteristics. [½]
- Also, where a company operates in multiple industries, it can become difficult to categorise. [½]
- Within a particular industry, there will also be a mixture of businesses, e.g. a cyclical industry will also include some growth companies. [½]
- If the index is reviewed infrequently there is a danger that the indices become out of date as companies change over time. [½]

[Max 5]

[Total 11]

This question produced the lowest average mark with part (ii) producing lower marks than part (i). Candidates who performed less well do not seem to have read the question and seemed to have answered a different question.

Q7

(i) Portfolio performance is generally measured in three ways:

<u>Performance relative to published indices</u> [1]

- The main advantage of assessing the performance relative to published indices is that it is relatively easy to do. By definition, the data for published indices is readily available – and it should be reliably accurate. [½]
- However, this advantage can be easily outweighed by a major potential disadvantage: the published index might not be appropriate. There may be no single index which is consistent with the objectives of the investor. [½]

Performance relative to other portfolios [1]

- This type of comparison is appropriate if the funds being compared have the same objectives and the same factors influencing investment strategy. It also gives an indication of the cost or benefit of following a particular strategy, relative to that adopted by other funds. [½]
- However, it may be totally inappropriate to compare the performance of funds which have very different investment objectives. [½]

Performance relative to a benchmark portfolio [1]

- Benchmark portfolios can be constructed to reflect the objectives of the fund. They should also be constructed in such a way that the data necessary for comparisons is easily obtained. [½]
- By having a benchmark portfolio which reflects the liabilities of the fund, the danger of giving the fund manager conflicting objectives is also avoided. This would occur where the basis for assessment encourages the fund manager to adopt a strategy which is not necessarily consistent with the objectives of the fund. [½]

Other comments:

As well as the returns achieved, an important element to consider is the risk taken in achieving those returns, risk based measures can be used to achieve this. [½]

[Max 6]

(ii) Fund A

Time weighted return = $(((130-25)/100) * ((153-10)/130) * ((119+35)/153))^{(1/3)}$

$= 1.051486585$

i.e 5.15%

1.5 marks for correct answer, deduct 0.5 mark for each error. [1½]

Money weighted return = i in the equation

100(1+i)3+25(1+i)2+10(1+i)-35=119

This can be solved by trial and error to give 5.045%

This can be approximated to:

100(1+3i)+25(1+2i)+10(1+i)-35 = 119

This gives 5.28%

Either of these answers are acceptable

1.5 marks for correct answer, deduct 0.5 mark for each error. [1½]

Fund B

Time weighted return = (109.8/100)(1/3)

= 1.03165

i.e. 3.165%

1.5 marks for correct answer, deduct 0.5 mark for each error. [1½]

Money weighted return = i in the equation

100(1+i)3 = 109.8

i.e. 3.165%

1.5 marks for correct answer, deduct 0.5 mark for each error. [1½]

[Max 6]

(iii) On both measures fund A outperformed fund B. [1]
The money weighted returns and time weighted return for fund B are identical as there were no cash flows. [½]
whereas there is a difference for fund A, this being due to the cash flows. [½]
The time weighted return for fund A is greater than the money weighted return as the time weighted return was shows the benefit of the cash flows being invested. [½]
In cases where there are cash flows into funds the time weighted method most accurately depicts the fund's performance. [1]

[Max 2]

(iv)

Method A						
Fund A	Year 1	Year 2	Year 3			
Time weighted return	(130-25)/100	(153-10)/130	(119+35)/153	Mean	Total	
	105.00%	110.00%	100.65%			1/2 Mark
Time weighted return (%)	5.00%	10.00%	0.65%			
Benchmark	-1%	4%	1%			
Relative Performance	6.00%	6.00%	-0.35%	3.88%		1/2 Mark
(Rel Perf - mean of rel perf) squared	0.000447521	0.000447521	0.001790083		0.002685	
Tracking error	3.66%					1/2 Mark
Annualised performance of benchmark	1.013125631					
i.e.	1.31%					1/2 Mark
Annualised performance of fund	5.15%					
Relative performance over three years	3.84%					1/2 Mark
Information ratio	104.70%					1/2 Mark
Fund B	Year 1	Year 2	Year 3			
Time weighted return	100/100	105/100	109.8/105	Mean	Total	
	100.00%	105.00%	104.57%			1/2 Mark
Time weighted return (%)	0.00%	5.00%	4.57%			
Benchmark	-1%	4%	1%			
Relative Performance	1.00%	1.00%	3.57%	1.86%		1/2 Mark
(Rel Perf - mean of rel perf) squared	7.34694E-05	7.34694E-05	0.000293878		0.000441	
Tracking error	1.48%					1/2 Mark
Annualised performance of benchmark	1.013125631					
i.e.	1.31%					1/2 Mark
Annualised performance of fund	3.17%					
Relative performance over three years	1.85%					1/2 Mark
Information ratio	124.78%					1/2 Mark

Method B						
Fund A	Year 1	Year 2	Year 3			
Time weighted return	(130-25)/1	(153-10)/1	(119+35)/1	Mean	Total	
	105.00%	110.00%	100.65%			1/2 Mark
Time weighted return (%)	5.00%	10.00%	0.65%			
Benchmark	-1%	4%	1%			
Relative Performance	6.00%	6.00%	-0.35%	3.88%		1/2 Mark
Rel Perf squared	0.0036	0.0036	1.2E-05		0.007212	
Tracking error	6.00%					1/2 Mark
Annualised performance of benchmark	1.013126					
i.e.	1.31%					1/2 Mark
Annualised performance of fund	5.15%					
Relative performance over three years	3.84%					1/2 Mark
Information ratio	63.89%					1/2 Mark
Fund B	Year 1	Year 2	Year 3			
Time weighted return	100/100	105/100	109.8/105	Mean	Total	
	100.00%	105.00%	104.57%			1/2 Mark
Time weighted return (%)	0.00%	5.00%	4.57%			
Benchmark	-1%	4%	1%			
Relative Performance	1.00%	1.00%	3.57%	1.86%		1/2 Mark
Rel Perf squared	0.0001	0.0001	0.001276		0.001476	
Tracking error	2.72%					1/2 Mark
Annualised performance of benchmark	1.013126					
i.e.	1.31%					1/2 Mark
Annualised performance of fund	3.17%					
Relative performance over three years	1.85%					1/2 Mark
Information ratio	68.20%					1/2 Mark

[Max 6]

(v) Fund A has produced the better performance, however its tracking error is higher indicating it has taken more risk in achieving it [1]
The information ratios show Fund B's being higher this points to the fact that Fund B risk return profile is superior. [1]
However before making any judgements it should be determined what the objectives of each fund were. [½]
[Max 2]

[Total 22]

As in all calculation questions candidates are advised to show their workings, while writing the correct answer down with no workings will gain maximum marks, writing the wrong answer down will gain no marks. Reasonable answers were given to parts (i), (ii) and (iii). It was recognised that tracking error can be defined in more than one way and credit was given for any reasonable approach, however despite this part (iv) was the worst scoring part of this question. In order to score marks in part (v) candidates had to interpret their previous calculations, if they had come up with different answers to those above they still gained marks by commenting on the answers they produced, however many did not correctly interpret their calculations.

[Paper Total 100]

END OF EXAMINERS' REPORT

