

# **INSTITUTE AND FACULTY OF ACTUARIES**

## **EXAMINERS' REPORT**

September 2021

### **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.

Sarah Hutchinson  
Chair of the Board of Examiners  
December 2021

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

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.

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.

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

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 candidate performance in this diet of the examination.**

While some questions proved more challenging than others there was not a large difference between the questions in terms of marks awarded compared to marks available. It looks like the majority of candidates were able to complete the exam within the allotted time.

There were a number of candidates who answered a question that they thought was asked rather than the one that was actually asked.

Candidates who showed how they reached the answer to numerical questions made it possible for some marks to awarded even when the final answer was wrong, however without any indication of how the answer was calculated wrong answers scored zero.

### **C. Pass Mark**

The Pass Mark for this exam was 56  
279 presented themselves and 128 passed.

## **Solutions for Subject SP5 – September 2021**

### **Q1**

(i)

The investment portfolio is designed to be tailored to a specific set of liabilities [1]

So movements in the liabilities will be offset by movements in the assets	[½]
This is done by closely matching	
The interest rate sensitivity of the liabilities	[½]
The inflation-linkage of the liabilities	[½]
The currency of the liabilities	[½]
The shape of the liabilities	[½]
And their duration	[½]
So the investment risk is reduced	[½]
The outcome effectively immunises an investor against future changes in interest rates and inflation	[½]
So the pension fund can meet its obligations as they fall due	[½]
It does not however eliminate longevity risk	[½]

[Marks available 6, maximum 4]

(ii)

This allows LDI strategies to hold bonds on an unfunded basis (i.e. invest in bonds without requiring the capital to purchase the bonds)	[½]
A larger interest rate and inflation hedge can be constructed without deploying the equivalent level of capital	[½]
This can free up capital to direct towards 'return-seeking' assets if a pension scheme is less well funded and requires return (but also needs interest rate and inflation protection)	[½]
It is a more efficient use of capital	[½]

(iii)

With an unfunded approach, if interest rates were to increase substantially, or inflation fell substantially, this would require a capital injection to maintain the level of target hedging	[½]
It requires a higher level of understanding for pension trustees and regular training to ensure full understanding	[½]
The fees incurred from unfunded strategies will tend to be greater; and	[½]
An increased governance burden on schemes.	[½]
The pension fund will need to meet the collateral requirements on any swaps or repos it has taken out	[½]

(iv)

The nature of the liabilities change over time, sometimes rapidly	[½]
Therefore a static LDI benchmark could soon become out of date	[½]
Therefore the LDI benchmark needs to be reviewed periodically	[½]
Also changes in unhedged factors that affect the liabilities, e.g. longevity, could lead the benchmark to become out of date	[½]
A fully 'dynamic' LDI portfolio could be implemented such that it is constantly changing to adjust as interest rates and inflation move	[½]
However, from a practical perspective, most Schemes will review (and/or refresh) their benchmark on a periodic basis	[½]
Further refinements include setting triggers such that if there are x% moves in interest rates or inflation, this triggers a benchmark 'health check' which could lead to resetting the benchmark outside of the periodic review cycle.	[½]

[Marks available 3½, maximum 2]

(v)

A deep and liquid market may not exist for interest rate and inflation derivatives in order to provide the option of utilising swaps	[½]
and so there is less market liquidity available which will drive up transaction cost relative to the bond market	[½]
Few banks offer or operate in the derivatives market reducing the flexibility and purchasing power of investors	[½]
So it might be difficult to find a counter party	[½]
increasing the credit/concentration risk to single counterparty banks	[½]
Greater expertise may be required	[½]
And there may be regulatory issues	[½]
Which may mean higher fees	[½]
There may be tax implications	[½]
Investing in swaps can give rise to liquidity risk	[½]
Or basis risk	[½]
Or cross hedging risk	[½]
There may also be rollover risk	[½]
A deep and liquid market of government bonds exists and alternatives to government bonds	[½]
If the liability profile is shorter dated in nature and can be matched from the bond market	[½]
The inflation exposure of the liability profile can be met more efficiently from the bond market	[½]
Legislation may prohibit the use of unfunded approaches to hedging or penalise the approach with a capital charge	[½]
There may be a desire to avoid governance and time of setting up ISDA agreements with counterparties	[½]
and reduce the governance time required to manage the collateralisation of the swaps	[½]
There may be less appetite to enter a contract which could be costly or difficult to exit relative to the liquid bond market that may exist	[½]
Nervousness of the counterparty risk in general of the banking system and a preference for the sovereign bond market in the geographic regime	[½]
An attempt to reduce the level of basis risk by sticking solely to a bond based hedging strategy	[½]
Low negotiated investment management fees which provide a better cost saving approach	[½]

[Marks available 12, maximum 7]

**[Total 17]**

*This question produced a reasonable response with candidates scoring well in parts (i), (iv) and (v). The large number of marks available in (v) helped candidates score well.*

## Q2

(i)

We are not told how old the most recent financial statements are and this is an important fact as the financial position could have changed significantly since the publication of these statements	[1]
The greater the time since the preparation of the last published financial statements the less relevant the figures are likely to be	[½]
The immediate concern will be whether the company can survive without revenue	[1]
And whether the investor believes the crisis will actually be over in 12 months	[½]
Whether the accounts are sufficiently detailed to allow the investor to decide	[½]
The balance sheet will show the financial strength of the company	[½]
and thus what resources it has to weather the storm	[½]
The level of debt/gearing is important	[½]
High debt will be difficult to service with little revenue coming in	[½]
Whereas high retained profits / shareholders' funds would provide a cushion	[½]
Net liquid assets will be needed to meet cash needs	[½]
The income statement may be less useful	[½]
because revenue in the coming year will be significantly lower than the previous year	[½]
The proportion of costs can be cut on a short term basis may be ascertained	[½]
Can liquid resources fund interest payments and other fixed costs?	[½]
The investor can calculate accounting ratios (e.g. interest cover)	[½]
But is likely to need to adjust them as previous income unlikely to be a good guide to the current income	[½]
The investor will also need to look beyond the 12 month period as there are likely to be longer lasting impacts on the profitability of FlyHoliday	[½]
Does FlyHoliday have any other sources of income	[½]
And how are they impacted by global crisis	[½]

[Marks available 11, maximum 7]

(ii)

Management ability	[½]
i.e. how confident is the investor in management's ability to deal with the crisis?	[½]
The quality of the company's products	[½]
This will affect how well and how quickly it recovers after the crisis	[½]
Government or state aid	[½]
If so on what terms	[½]
Competition	[½]
Is the company stronger than its competitors and therefore more likely to survive and in due course prosper?	[½]
What is its market share	[½]
How strong is their brand	[½]
And how much customer loyalty do they command	[½]
Prospects for the market	[½]
i.e. how likely is it the travel and holiday market will recover after the crisis and how long will this take?	[½]
Any statements by management	[½]
What are the views of others e.g. press and brokers or competitors	[½]
Has the share price over reacted	[½]
Input costs – have they changed as a result of the crisis	[½]

Do they own or lease the planes	[½]
Is the company run efficiently and does it manage its costs well?	[½]
Access to external capital	[½]
i.e. can the company access debt or equity capital to meet liquidity needs or for future investment	[½]
And if so, on what terms?	[½]
Does FlyHoliday own other assets	[½]
If so are they impacted by the global crisis	[½]
Is there likely to be any Government or State aid	[½]
Is so on what terms	[½]
The size of the holding in relation to the rest of the portfolio	[½]
How diversified their portfolio is	[½]
The risk appetite of the investor	[½]
And their time horizon	[½]
The general state of the economy	[½]
Does the investment in FlyHoliday meet the investor's requirements	[½]
The investor may also compare FlyHoliday with other investments to see if there are potentially better investments	[½]
The investor may look at FlyHoliday's competitors in particular to see if they offer potentially better returns	[½]

[Marks available 17 maximum 6]

(iii)

The investor should first assess whether the company is likely to be financially strong enough to survive the crisis	[1]
If not, they should sell the shares	[½]
Often when making these decisions it is good to look at trends rather than isolated number	[½]
If they believe it will survive, the investor will assess the future prospects for the company	[½]
Has the competitive environment changed	[½]
If so has it improved or got worse	[½]
To estimate dividends and capital growth based on expected profits/earnings & cash flows and enterprise value	[½]
These estimates can be used to determine a value for the company e.g., using DCF model or P/E ratios	[½]
This could involve some scenario analysis with various key variables being flexed and then be compared with the market value	[½]
The investor can decide to buy, sell or hold the shares according to whether they appear to be materially undervalued, overvalued or at fair value	[½]
Different types of investor (e.g., value, growth, momentum, contrarian, etc.) may reach different conclusions	[½]
The tax status of the investor may be relevant	[½]

[Marks available 8, maximum 5]

*Despite the number of marks being available in part (i) only the better prepared candidates scored highly.*

*Part (ii) was well answered.*

*Like part (i), part (iii) produced a range of responses from candidates.*

### Q3

(i)(a)

Solve  $(x \cdot 6) + (1-x) \cdot 9 = 7.5$

$X = 0.5$

Therefore a return of 7.5% can be obtained by investing 50% of the portfolio in fund A and 50% in fund B [1]

(b) This will produce a portfolio beta of 1.25 [1]

(ii)

There are a large number of combinations that will produce a portfolio Q that has a beta of zero. Any solution that produces a beta of zero is acceptable, the most obvious solution is probably

Solve  $(x \cdot 1.1) + (1-x) \cdot 1.5 = 1.25$  [1]

$X = 0.625$  [1]

A portfolio consisting of 62.5% fund C and 37.5% fund D will have a beta of 1.25, call this portfolio S [1]

Going long of portfolio P and shorting an equal amount of portfolio S will produce a portfolio with a beta of zero [1]

(iii)

This combination would produce a return of -0.125%

Any other return figure is acceptable if correctly based on the fund proportions in (ii) [1]

**[Total 7]**

*Part (i) produced the highest average mark on the paper.*

*Whilst parts (ii) and (iii) did not score as highly on average, overall this question was one that witnessed some of the best responses from candidates.*

### Q4

(i)

Diversification requirement would suggest use of a mix of approaches may be suitable [1]

Liquidity tends to be low [1/2]

And there is no "market-place" for trading [1/2]

But this should not be a problem as the investor is holding for the long-term [1/2]

Accurate and up to date pricing may not be available, so valuation difficult [1/2]

Should not be a concern unless there is a specific need for accurate valuation [1/2]

Returns in private equity tend to be relatively high [1/2]

They are also long term investments [1/2]

And real in nature [1/2]

Meeting investor's goal [1/2]

Although individual investments can be risky [1/2]

Relatively low correlation with other asset classes [1/2]

Helps to achieve diversification goal	[½]
Although low correlation may be in part due to opaque pricing	[½]
Private equity generally requires a long-term commitment	[½]
Which is consistent with the investor's situation	[½]
Further drawdowns of funds from the investor are likely	[½]
Which would absorb the investor's surplus cash	[½]
Private equity tends to be relatively expensive form of investing	[½]
With a high annual management fee	[½]
And often an additional share of "profits"	[½]
Which conflicts with the investor's goal of low fees	[½]
There may be tax implications to investing in private equity either directly or via collective vehicles	[½]
Investing in private equity funds does allow investors to gain exposure to a wider range of projects thus increasing diversification which was one of the investor's requirements	[1]
And allows the investor to gain exposure in smaller unit sizes	[½]
It also reduces the amount of expertise needed in selecting the projects	[½]
However it will mean that the investor has another layer of fees to pay which isn't what the investor was looking for	[½]
The investor should not consider fees in isolation, but rather, whether the anticipated net-of-fees return is sufficient for his needs	[1]
And the investor will still need to decide which collective funds to choose	[½]
Investing in collective funds may increase the liquidity compared to direct investment in private equity	[½]
Private equity funds may have substantial cash holdings which will dilute the returns from private equity	[½]
By investing in collective funds issues regarding valuation are dealt with by the manager of the collective fund	[½]
Some collective funds may be happy to accept regular cash sums especially if the investor has said how much they will be contributing and how often	[½]
However they will then need to adhere this schedule	[½]
	[Marks available 18½, maximum 7]

(ii)

Real estate investing	
The time horizon is longer than for quoted equities which is okay as the investor has a long time horizon	[½]
Liquidity is better than private equity	[½]
However in times of crisis the ability to sell may disappear completely and long deferment periods may be imposed for buyers or sellers depending on the situation	[½]
This may not be an issue for the investor given their long term horizon	[½]
And the fact they are cash flow positive	[½]
Outside periods of stress liquidity is generally better than that in private equity	[½]
Real estate has high transaction costs	[½]
The returns from real estate show some correlation with other markets,	[½]
And are real in nature	[½]
However purchasing real estate will increase the investor's diversification	[½]
Real estate valuation has a subjective element	[½]
Values are calculated with reference to yields which are based on current bond rates	[½]

True value is only ascertained when the property is traded	[½]
Like private equity this may account for some of the lack of correlation	[½]
The fees charged by property funds vary and are higher than those paid for managing equities or bonds	[½]
Again like private equity the level of fees should be judged against the potential return	[½]
And the fact that the investor's portfolio will be more diverse which is their main aim	[½]
There may be tax implications to investing in real estate either directly or via collective vehicles	[½]
Investing in real estate funds does allow investors to gain exposure to a wider range of projects thus increasing diversification which was one of the investor's requirements	[1]
And allows the investor to gain exposure in smaller unit sizes	[½]
It also reduces the amount of expertise needed in selecting the properties	[½]
However it will mean that the investor has another layer of fees to pay which isn't what the investor was looking for	[½]
The investor should not consider fees in isolation, but rather, whether the anticipated net-of-fees return is sufficient for his needs	[½]
And the investor will still need to decide which collective funds to choose	[½]
Investing in collective funds may increase the liquidity compared to direct investment in real estate	[½]
By investing in collective funds issues regarding valuation are dealt with by the manager of the collective fund	[½]

[Marks available 13½, maximum 7]

(iii)

The investor should consider whether a fund meets their requirements in terms of:	
Tax status – how is the fund taxed and does it result in and tax benefits arising or will the investor incur extra tax charges by investing in the fund	[½]
Ethical and SRI stance – does the fund's investment policy fit with the investor's ethical & governance standpoint	[½]
Risk profile – does the fund match the investor's risk profile	[½]
The return required – are the funds targeted returns in line with what the investor requires	[½]
The size of the fund, in particular in relation to the amount the investor is investing	[½]
Liquidity is the fund sufficiently liquid to allow the investor to invest and divest within a timeframe that the investor is happy with	[½]
The amount they will be investing as a proportion of the investor's total wealth the greater the proportion the more the vehicle needs to meet the investor's needs	[½]
The fees charged both initially	[½]
And on a continuing basis	[½]
The investment timeline for the collective fund, is this in line with the investors own timeline	[½]
And the prospects for the market	
Regulatory position of the fund, is the investor allowed to invest in the fund and is this likely to change in the future	[½]
The structure of the fund e.g. is income retained or distributed	[½]
Can the fund borrow, if so to what extent is borrowing allowed	[½]
While past performance is not an indicator of future performance there is some evidence that future performance is correlated with past performance particularly in private equity	[½]

However this may be due in part to survivorship bias	[½]
Meaning statistics skewed by performance of strongly performing funds and absence of “failed” funds	[½]
Thus investor should pay particular attention to the selection of the manager	[1]
Risk and return profiles differ according to the form of investment	[1]
seed capital (start-ups) may see high failure rates and high returns from success	[½]
Whereas development capital likely to have lower risk/return profile	[½]
Private equity tends to use high levels of debt and leverage	[½]
So may perform better when cost of debt is low	[½]
Or may struggle if interest rates increase	[½]

[Marks available 12½, maximum 6]

**[Total 20]**

*Part (i) produced the best answers with candidates scoring less well in parts (ii) and (iii).*

*A significant number of candidates ignored the fact that the investor was looking to invest in a collective vehicle and just wrote about private equity and real estate. There were also a number of candidates provided answers that suggested the real estate sector consisted entirely of residential property and did not give due consideration to other types of property such as commercial.*

## Q5

The government would be likely to use a combination of the policies	[1]
Changing one will often result in changes in another	[½]
The ability of the government to address these issues will depend on a number of factors	
The degree of the price differential	[½]
Whether this is likely to a long term problem	[½]
The state the domestic industry is in	[½]
The state of the overall economy	[½]
The effectiveness of any of the policies will depend on C's position in the global markets	[½]
Particularly how it compares to the other country that is undercutting C's export industry	[½]
And any response from other countries	[½]
As C is a small country it may be difficult to compete with larger countries which have greater economies of scale	[½]

## Monetary policy

The amount of room that the government has to change monetary policy will depend on where it starts from	[½]
As this product is exported stimulating the domestic economy may not increase demand for this product.	[½]
However if interest rates were cut this may result in the currency being devalued making the product cheaper	[½]
Lower interest rates could also boost the domestic economy reducing overall unemployment	[½]

It would also reduce the cost of borrowing for industry which may allow them to reduce prices and regain their competitiveness	[½]
Or reinvest in their industry to increase efficiency	[½]
Therefore making it easier to cope with the unemployment resulting from the failure of the industry	[½]
There is also a danger that a looser monetary policy may cause inflation to rise	[½]
If inflation gets too high this may have a negative impact on the economy and result in lower levels of employment etc. further down the line	[½]
Fiscal policy	
The government could reduce corporate taxes	[½]
Either just for that industry	[½]
Or across the whole economy	[½]
Reducing taxes would allow this industry to reduce its prices	[½]
It could also give tax breaks for investment aimed at improving productivity	[½]
If productivity in this industry is improved prices could be reduced	[½]
Or incentives to spend more on R&D to encourage to innovate and thus improve the attractiveness of their products	[½]
More money may be spent in training so that those made unemployed are better able to find alternative employment	[½]
The government may also chose to subsidise the production of this industry	[½]
Subsidies could take the form of cash injections into these industries	[½]
However this may result in tariffs being applied by other countries	[½]
Reduced taxes could also stimulate domestic demand by giving people more money to spend	[½]
However any tax reduction may need to be accompanied by a reduction in government expenditure which may result in less economic activity	[½]
Rather than cutting taxes government expenditure could be increased to create new jobs	[½]
Unemployment benefits could be cut, thereby increasing the incentive to work and reducing unemployment	[½]
Prices & Incomes	
Price caps could be imposed on this industry	[½]
However without other action this may just result in the industry becoming unprofitable and closing down	[½]
Wage caps could also be applied either just on that industry which would make working in that industry less attractive	[½]
Or they could be applied across the whole economy which is likely to be unpopular	[½]
However it may reduce the price of labour in real terms, leading to a reduction in unemployment	[½]
And could only work for a short period	[½]
The government could reduce any minimum wage rate, making it cheaper to employ people and reducing unemployment	[½]
Exchange rate	
If the currency weakens e.g. due to lower interest rates then the product may become competitive	[½]
This may increase demand for C's exports	[½]

Equally it may make C a more attractive country to visit thus creating more jobs	[½]
However it would increase the cost of imports	[½]
Which may increase the costs of production	[½]
If the exchange rate is fixed or pegged to another currency, the government could devalue the exchange rate to reduce the foreign price of the exports, so making them more competitive	[½]
If the exchange rate is floating, a reduction in interest rates is likely to decrease demand for the currency on the foreign exchange markets and so lead to a decrease in the exchange rate	[½]
Similarly, an increase in the money supply is likely to increase the supply of currency on the foreign exchange markets and lead to a decrease in the exchange rate	[½]
As C is small it may find it difficult to influence the level of its currency for anything other than the short term	[½]
	[Marks available 25½, maximum 9]

*This was the best answered question on the paper, partially reflecting the large number of marks available. Those candidates who just described the various policies but did not apply them to the situation facing Country C did not score well.*

## Q6

(i)	
There are many different types project	[1]
e.g. hospitals, schools, bridges	[½]
The valuation of an asset may be difficult to establish	[½]
And may involve the need to access confidential information	[½]
And the constituents of the index will need to be determined	[½]
So that it reflects all types of infrastructure project	[½]
And the geographic spread of these projects	[½]
The projects will be in different countries so exchange rates might be an issue	[½]
A method of weighting will need to be determined	[½]
Will assets under construction under construction be included	[½]
If so how will they be valued	[½]
How will all these projects be monitored	[½]
So that the index can be calculated on a regular basis	[½]
The bank will require infrastructure experts and/or consultants	[½]
	[Marks available 7½, maximum 4]

## (ii)

Year 1: Asset 1 return given by  $80/75-1 = 6.66\%$

Asset 2 return given by  $12(1+i) + 15(1+i)^{0.5} = 30$   
Therefore  $i = 15.4\%$  or  $15.6\%$  is acceptable

Asset 3 return given by  $80(1+i) = 78+5$   
Therefore  $i = 3.75\%$

The question may be interpreted as having the income included in the final figure, if candidates have interpreted the question in this way then the answer is -2.5% i.e.  $80(1+i) = 78$

Asset 4 return given by  $40(1+i) + 10(1+i)^{0.5} = 45$   
Therefore  $i = -11.11\%$  or  $-11.08\%$  is acceptable

Asset 5 return given by  $100(1+i) + 50(1+i)^{0.5} = 165$   
Therefore  $i = 12.0\%$  or  $12.07\%$  is acceptable

Asset 6 return given by  $75(1+i)^{0.5} = 80$   
Therefore  $i = 13.3\%$  or  $13.78\%$  is acceptable [3]

(iii)

The return in year one is given by  $307(1+i) + 150(1+i)^{0.5} = 478+5$   
Therefore  $i = 6.81\%$  or  $6.83\%$  is acceptable

If the candidate interpreted (ii) as including the income in the final figure then the answer to this part is given by  $307(1+i) + 150(1+i)^{0.5} = 478$   
Therefore  $i$  would be  $i = 5.51\%$  or  $5.49\%$  is acceptable [1]

(iv)

The return produced by the portfolio in each of the years was fairly consistent at around  $6.75\%$  [1/2]

In each year the portfolio outperformed [1/2]

With the outperformance in year 1 being greater than year 2 [1/2]

However the individual assets performed very differently

Asset 1 underperformed modestly over the two years [1/2]

While Asset 2 showed double digit returns in both years and was the best performing asset [1/2]

Asset 3 produced stable but low returns both years growth was below  $4\%$  [1/2]

Asset 4 performed the worst with a large negative return in year one and no return in year 2 [1/2]

Like asset 2, asset 5 produced double digit returns [1/2]

Asset 6 produced a double digit return in year 1 but much more modest growth in year 2 [1/2]

The assets that were still under construction showed the greatest volatility [1/2]

In the event that candidates produced the wrong answer for (iii) then if their comments are pertinent to those incorrect figures they were awarded marks

[Marks available 5, maximum 2]

(v)

The main issue is how to value the assets under construction [1]

(vi)

The assets under construction are not income producing [1/2]

However a value could be calculated by looking at the potential income stream and discounting it back [1/2]

Using a suitable discount rate that reflects the risks involved [1/2]

Future amounts that need to be spent to complete the project would be deducted again these need to be discounted	[½]
The asset value could just be the amount that has been invested so far	[½]
However this might lead to an over valuation as circumstances may have changes which has reduced the future revenue streams associated with the asset	[½]
Or possible an undervaluation especially in the latter stages of the construction when the future income streams are just about to start	[½]
	[Marks available 4½, maximum 2]
	<b>[Total 13]</b>

*This question proved the most challenging despite there being some relatively straightforward calculations.*

*Candidates who came up with alternative answers to part (v) were given credit in part (vi) assuming their answers actually addressed the issue they mentioned in part (v).*

### Q7

(i)(a)

Availability bias or  
Representative bias or  
Loss Aversion [1]

(b)

Representative bias or  
Anchoring or  
Availability bias [1]

(ii)(a)

Availability bias  
When estimating probabilities of future outcomes, people tend to excessively focus on more recent and more salient events [½]  
The stock market crash is prominent in people's minds [½]  
So their perception of the risk of equities is increased, which deters more people from investing in them [½]

Representative bias

Investors putting too much emphasis on the stock market crash [½]  
And therefore overestimating the chance it will happen again [½]  
And is ignoring other important data which could indicate the future prospects for the investment fund [½]

Loss Aversion

Following the stock market crash an investor may become more sensitive to losses than gains [½]  
This may make investors less inclined to invest in bond funds [½]  
Even if the bond funds were not impacted by the crash [½]

(b)  
 Representative bias  
 The investor is assuming that strong recent performance is representative of a good investment [½]  
 But is ignoring other important data which could indicate the future prospects for the investment fund [½]  
 e.g., manager skill, market conditions, investment style, risk controls, etc [½]

Anchoring  
 The investor is anchored on the strong past performance [½]  
 And believes it will happen again [½]  
 Availability bias  
 When estimating probabilities of future outcomes, people tend to excessively focus on more recent and more salient events [½]  
 The strong performance is prominent in people's minds [½]  
 So the investor selects the funds with the strong past performance [½]  
 If the candidate gave different answers for part (i) and gave a reasonable explanation in part (ii) then they were awarded credit in part (ii)

[Marks available 8½, maximum 2]

(iii)  
 Students should bet on the outcome they consider the most likely to occur [½]  
 They can use the anchoring and adjustment heuristic to assess which option is the most likely outcome [½]  
 An anchoring and adjustment heuristic means starting with an initial value and adjusting away from it to arrive at an estimate for the desired quantity [1]  
 Estimating (a) is trivial (50%) [½]  
 To estimate (b) and (c), subjects start with the probability of each individual draw [½]  
 Which is 90% for (b) and 10% for (c) [½]  
 Then adjust to allow for the fact that the event needs to happen 7 times consecutively, or just once in seven tries [½]

(iv)  
 The subjects' order of preference is the reverse of that implied by the actual probabilities [1]  
 This implies they have tended to over-estimate the probability of (b) occurring [½]  
 and to underestimate the probability of (c) occurring [½]  
 The "anchors" are the probabilities of drawing a black pencil on the first draw [½]  
 i.e., 90% for (b) and 10% for (c) [½]  
 When adjusting, people tend to make adjustments that are too small [1]  
 Therefore, starting with a high value for the anchor (90%), most people end up with a value that is too high for option (b) [½]  
 And starting with a low value for the anchor (10%), they tend to end up with a value that is too low for option (c) [½]

[Marks available 5, maximum 4]

(v)(a)  
 Investors continue to hold investments that are falling in value [1]  
 Investors / analysts making forecasts (e.g., of earnings, market returns, etc.) [1]

(b)

The original purchase price is the anchor in assessing the share's current value [½]

And they fail to adjust sufficiently for subsequent negative information affecting the share price [½]

Investors / analysts become anchored to historic data (e.g. recent earnings, current market levels) [½]

But they pay insufficient attention to the variability in these parameters [½]

**[Total 16]**

*This question was relatively well answered with most candidates scoring well on parts (ii) and (v).*

*It should be noted that in part (i) the question asks for the single behavioural bias, so candidates who gave more than one only received marks for the first bias that was put down.*

**[Paper Total 100]**

**END OF EXAMINERS' REPORT**