

INVESTMENT

EXAM MARKING GUIDE SEMESTER 2 2023



Marking Guide

This examination represents 80% of the available marks for the Investment subject. The remaining 20% comes from the assignment.

There are four questions in the examination. Each question has several parts. The table below summarises information relating to each part of each question:

- The modules from which material relating to the question was drawn.
- The learning objectives to which each question relates.
- The apportionment of the marks for the question across the three main skill levels: knowledge, application, and higher order

Question	Part	Syllabus Learning Objective	Module from which material drawn	Total Marks	SA	A	H
1	A	4.1,4.2	M2	6	6		
1	B	4.2	M2	2	2		
1	C	4.3, 1.1, 1.2	M2, M3	12			12
1	Total			20			
2	A	1.1,1.2,2.1	M3,M4	10		10	
2	B	1.1,1.2,2.1	M3,M4	3		3	
2	C	1.1,1.2,2.1	M3,M4	3		3	
2	E	2.2,5.1,5.2	M4,M6	4		4	
2	Total			20			
3	A	1.1,1.2,2.1	M3,M4	5		5	
3	B	1.1,1.2,2.1,2.2	M3,M4	5		5	
3	C	2.1,2.2	M4	5		5	
3	D	3.1,3.2	M5	5		5	
3	Total			20			
4	A	3.1, 7.1,7.2	M5,M8	6	6		
4	B	3.1,8.2,8.3,8.4	M8,M9	10	2		8
4	C	9.3,9.4	M10	4			4
4	Total			20			
TOTAL				80	16	40	24
% of total					2%	50%	30%



The target allocation across the three skill levels of the overall assessment for the Subject (Assignment and Examination) is:

- **SA** – Simple application (formerly Knowledge) 20%
- **A** – Application 50%
- **H** – Higher order/ Judgment/Evaluation 30%

In the pages below the questions are set out in black font. **Marking guide information is presented in blue font.** The sample answers are not the only possible answers.

Note to Markers:

An overarching principle is that marks should be awarded for necessary work undertaken by a student to arrive at an answer to a question. This may be considered as telling a story to answer the question that is being asked. When marking, please award marks for defining terms, describing background and context that is relevant to 'telling a story' to answer the question.

*Guidance has been given to students that copying and pasting is allowed but they need to address the specified scenarios set out in the questions to pass the examination. The marking guide for each question generally states whether marks can be awarded for generic points or whether the points given must be linked to the context set out in the question. If the marking guide does not specify otherwise, marks **SHOULD** be awarded for relevant comments that may appear to have been copied and pasted from either the modules or another resource, such as a prudential or professional standard.*

Marks should also be awarded for any other relevant point even if it is not included in the marking guide.

As a rule, a complete sentence should be awarded 1 mark.

A complete sentence includes a clause and a connecting clause. An example sentence is 'The insurer pays a benefit on death' (½ mark for the clause) provided the premiums are paid (½ mark for connecting clause)'.

The exam questions each start with a 'command verb' that provides information to students and markers about what is expected in an answer to the question. Please watch the following short video for information about the learning levels and command verbs used by the Institute: https://www.youtube.com/watch?v=g1Oyv_RpfU4. Definitions of each of these command verbs are also provided within this marking guide.

Please note that some of the answers in this marking guide identify more worthwhile points than any one candidate may make. The marks indicated for all of the points go beyond what is required to gain full marks in the question. This is done deliberately to give markers a sense of the wide range of acceptable answers that students might give to a question. In some questions or parts of questions, it has been indicated that certain critical points need to be made to achieve full marks for the question or question part.



QUESTION 1

(20 marks)

You are an investment consultant advising the board of a shareholder-owned health insurance company, which provides benefits to its policyholders in the form of:

- annually renewable policies covering medical and hospital costs;
- long-term contracts covering future aged care costs.

The board has asked you to advise on setting the objectives for the asset portfolios that support the shareholders' funds and policy liabilities, considering issues relating to inflation, asset returns and risks that should be considered.

- a) Describe the characteristics of the shareholders' funds and of the liabilities that are being provided for by the asset portfolios that will influence setting investment objectives having regard to shareholders' expectations, policyholder expectations and inflation. (6 marks)
- b) List four characteristics that investment objectives for a portfolio of assets should have. (2 marks)
- c) Propose, with reasons, investment objectives for each of the asset portfolios that support the shareholders' funds and policy liabilities. (12 marks)

Marking guide

- a) **Describe the characteristics of the shareholders' funds and of the liabilities that are being provided for by the asset portfolios that will influence setting investment objectives having regard to shareholders' expectations, policyholder expectations and inflation. (6 marks) LO 4.1, 4.2, [M2]**

(Command verb: Describe (Level 2 – Understand): Provide information about specific items, showing that you understand what those items mean. A description is not a list; each item needs supporting information.)

Key points to cover:

- There are three different sets of needs which will lead to three asset portfolios and three sets of investment objectives **(0.5 mark)**
- A single asset portfolio would need to contend with the conflict of interest between reducing the risk of not paying claims and maximising returns to shareholders **(1.0 mark)**
- Therefore, there is a need for three asset portfolios, each with its own investment objectives **(0.5 mark)**
- The three portfolios and their characteristics are:



- annually renewable policies covering medical and hospital costs are short-tail liabilities with an average term of less than one year. **(0.5 mark)**
 - policyholders expect claims to be paid with certainty and no delay, i.e., paying claims on time and in full **(1 mark)**
 - The impact of inflation is limited by the term of the liabilities and can be covered by premium increases at annual renewal, **(0.5 mark)**
 - there may be competitive or regulatory limits on increases in premiums. **(0.5 mark)** which would limit the protection that premium increases can provide against inflation **(0.5 mark)** so there may be a need for assets which provide for protection against inflation **(0.5 mark)** such as floating rate securities **(0.5 mark)**
 - this will lead to an asset portfolio that matches short-dated liabilities with short-dated assets that are highly liquid and have very low volatility of capital value. **(0.5 mark)** so that they can be sold without loss to pay claims when needed **(0.5 mark)** but will have less prospect of higher returns in the long term **(0.5 mark)**
 -
- long term contracts covering future aged care costs are long-tail liabilities, similar to funding retirement incomes. **(0.5 mark)**
 - policyholders expect claims to be paid with certainty **(0.5 mark)** and for inflation of costs to be covered **(0.5 mark)**
 - need longer duration assets, **(0.5 mark)** which ideally provide a hedge against inflation **(0.5 mark)**
- shareholders' funds
 - effectively very long duration **(0.5 mark)**
 - shareholders have an expectation of returns on equity that are higher than inflation **(0.5 mark)** or fixed interest returns **(0.5 mark)** by an amount that reflects the equity risk premium **(0.5 mark)** which has historically averaged 5% p.a. to 6% p.a. **(0.5 mark)**
 - they also have a greater capacity to tolerate volatility in returns **(0.5 mark)** in return for the pursuit of higher returns in the long term **(0.5 mark)**

The impact of inflation will be most difficult with long tail liabilities and difficulty of finding assets that hedge against inflation **(1.0 mark)**

There is tension between seeking long-term return premia on growth assets and tolerating short-term return volatility of returns **(1.0 mark)**

Risk objectives—there is a need to discriminate between the volatility of returns at the asset class level and the definition of risk at the asset portfolio level- which is the probability of failing to meet the objective **(1.0 mark)**

Maximum 6 marks



- b) List four characteristics that investment objectives for a portfolio of assets should have. (2 marks) LO 4.2, [M2]

(Command verb: List (Level 1 – Remember): Present a number of connected items consecutively)

The investment objectives for each asset portfolio should have the following characteristics:

- be specific about:
 - return (0.5 mark)
 - risk (0.5 mark)
 - diversification of the portfolio (0.5 mark)
 - liquidity of the assets (0.5 mark)
- be measurable against relevant benchmarks (0.5 mark)
- specify a term or period for measurement against benchmarks (0.5 mark)
- be realistic and achievable (0.5 mark)
- be stated clearly (0.5 mark)

Maximum 2 marks

- c) Propose, with reasons, investment objectives for each of the asset portfolios that support the shareholders' funds and policy liabilities. LO 4.3, 1.1, 1.2 [M2] [M3] (12 marks)

(Command verb: Propose (Level 6 – Create): Select and communicate a solution, action, or range of possible solutions/actions. Rationale, reasons, or justification must be included.)

There are three asset portfolios, each with a set of investment objectives (1.0 mark)

The investment objectives should be in a form such as:

- short tail liabilities asset portfolio where assets need to have
 - average term of less than one year. (0.5 mark)
 - high capital security (0.5 mark)
 - high liquidity (0.5 mark)
 - returns that need not match or exceed inflation (0.5 mark) unless there are regulatory or market competition restrictions on premium rate increases (0.5 mark)
 - proposed investment objective



- return of at least 0% p.a. (or no-negative return) **(0.5 mark)** to reflect the need for capital security relating to claims payments **(0.5 mark)**
 - over rolling 1-year periods **(0.5 mark)** to match the term of the liabilities and the capacity to increase premiums to meet inflation risk **(0.5 mark)**
 - with a risk (probability of failure to meet return objective) of less than 5% in any year **(0.5 mark)** to minimise risk to shareholders of having to fund shortfalls of assets to meet claims **(0.5 mark)** (This may be expressed in terms such as a negative return 1 in 20 years)
 - supported by a portfolio of short-term, liquid, investment grade fixed interest **(0.5 mark)** diversified across a range of issuers, **(0.5 mark)** with no more than 5% invested with any single issuer **(0.5 mark)**
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- long tail liabilities asset portfolio where assets have
 - average term or duration that matches the duration of the liabilities **(0.5 mark)**
 - no need for short-term high capital security as long as the assets can recover from a downturn within a 3-year period **(0.5 mark)**
 - sufficient liquidity to meet projected cash flows of liabilities without the need for sales of long-duration assets during market downturns **(0.5 mark)**
 - returns that match or exceed inflation over the duration of the liabilities **(0.5 mark)**
 - investment objective
 - return of at least CPI plus $x\%$ p.a. where $x\%$ is the excess of expected health and age care inflation above the expected CPI **(0.5 mark)** to meet the risk of health care inflation **(0.5 mark)**
 - over rolling 5-year periods **(0.5 mark)**
 - with a risk (probability of failure to meet return objective) of less than 20% in any year **(0.5 mark)** (This may be expressed in terms such as a negative return 4 in 20 years)
 - supported by a portfolio diversified across a range of asset classes **(0.5 mark)** such as short-term, liquid, investment grade fixed interest, longer-term fixed interest, (at least 20%) and equities, **(0.5 mark)** diversified across a range of issuers, with no more than 5% invested with any single issuer **(0.5 mark)**
 - shareholders' funds where assets have:



- no need for short-term high capital security as long as the assets can recover from a downturn within a 3-year period **(0.5 mark)**
- sufficient liquidity to allow changes in portfolio composition without the need for sales of assets to meet dividend requirements during market downturns **(1 mark)**
- returns that meet shareholder expectations such as exceeding inflation by 5% p.a. over the expected holding period of the equity **(0.5 mark)**
- investment objective
 - return of at least CPI plus 5% p.a. **(0.5 mark)** to provide support for the required return on equity to shareholders at a required rate that reflects the long-term equity risk premium **(0.5 mark)**
 - over rolling 5-year periods (or longer) **(0.5 mark)** to reflect the long term duration of shareholder equity **(0.5 mark)**
 - with a risk (probability of failure to meet return objective) of less than 20% **(0.5 mark)** to reflect the risk tolerance of shareholders **(0.5 mark)**
 - supported by a portfolio diversified across a **range** of asset classes **(0.5 mark)** such as short-term, liquid, investment grade fixed interest, longer-term fixed interest, and equities, **(0.5 mark)** diversified across a range of issuers, with no more than 10% invested with any single issuer **(0.5 mark)**

END OF QUESTION 1: MARKING GUIDE



QUESTION 2

(20 marks)

You are an investment advisor to the Board of an Australian-domiciled charity which has a multi-asset class investment portfolio. You have been asked to explain some aspects to a newly appointed member of the Board, as set out in the questions below. You can use information from the following table which has been provided to the Board, in your explanations.

Asset class total returns for periods to 31 May 2023	Cash	Australian government bonds	Australian equities	International equities (in AUD terms)	Property securities
Benchmark index for asset class	RBA Bank Bill 90-days index	Bloomberg AusBond Composite all maturities TR index	S&P/ASX 200 TR index	MSCI world ex Australia TR index	S&P/ASX 300 AREITs TR index
Returns % p.a.					
5 years	1.2	1.0	7.5	11.3	4.4
10 years	1.7	2.5	8.1	13.1	7.9
30 years	4.2	5.6	9.2	7.4	7.4
Standard deviation of returns %					
5 years	0.3	5.2	15.4	12.4	24.7
10 years	0.3	4.1	13.9	11.3	19.3
30 years	0.6	3.9	13.4	12.1	16.5
1-year returns % p.a. in last 30 years					
Minimum	0.0	-11.5	-40.0	-24.9	-58.2
Median	3.7	4.5	11.1	8.9	12.7
Maximum	7.5	15.2	44.7	48.0	45.4
Percentage of 1-year returns that were negative	0.0	10.8	23.3	25.0	25.0
Largest historical drawdown					
Drawdown	0.0	-13.0	-47.2	-48.7	-70.6
Duration (months)	Na	22	15	27	16
Months to recover	na	Not yet	55	139	89



Explain:

- (a) the returns of the various asset classes and how they have changed over time and factors influencing returns; (10 marks)
- (b) the use of standard deviations of returns as indicators of risk as indicators of risk and any advantages and disadvantages of using this indicator; (3 marks)
- (c) the use of the probability of negative returns over 1 year periods as an indicator of risk and any advantages and disadvantages of using this indicator; (3 marks)
- (d) other statistical information that you would like to have seen in order to consider both return and risk. (4 marks)

Marking guide

Explain:

(Command verb: Explain (Level 4 – Analyse) Give an account of something with the goal of clarifying it to someone or making something easier to understand. Calls for even more information than describe, showing that you can convey ‘why’ or ‘how’ or ‘so what’. A connection is expected between the item(s) and something else.)

- (a) the returns of the various asset classes, how they have changed over time and factors influencing returns; (10 marks) LO 1.1, 1.2, 2.1 [M3], [M4]**

The 30-year period covered in the table includes a number of shorter periods where there have been major events such as economic recessions and major shifts in conditions in investment markets. (1 mark)

Note to markers: Candidates should explain what has happened in all 5 asset classes to get full marks. For example if one asset class is omitted, the maximum possible mark is 8/10. There is no cap on the number of marks that can be earned in any single asset class.

Some of the more significant features of asset class returns over the last 30 years have been:

- **Cash:** for most of the period, from the early 1990s to 2021 there was a decline in returns on cash (0.5 mark) driven mainly by a fall in inflation expectations (0.5 mark) as well as, in the 13 years following the GFC, concerted action by major central banks to maintain a stimulatory monetary policy during periods of major



economic and financial market weakness. **(1 mark)** This policy comprised keeping short-term interest very low **(0.5 mark)** and also buying large amounts of government bonds, which reduced the yield on government bonds and increased returns on bonds (Quantitative easing). **(1 mark)**

- Over the longer term (30 years) returns on cash have been significantly higher than recently because this includes some earlier periods where there was higher inflation in the economy **(0.5 mark)** which the RBA had been trying to control by setting the RBA cash rate higher **(0.5 mark)** to incentivise saving and reduce spending to reduce the inflation rate. **(0.5 mark)**
- Returns on cash were consistently low for most of the 10 years to 2022 **(0.5 mark)** because the RBA cash rate was set at a very low level during that period **(0.5 mark)** due to persistent low levels of inflation in the economy post GFC. **(0.5 mark)**
- The RBA reduced the cash rate in order to disincentivise saving and incentivise spending **(0.5 mark)** to try and increase inflation towards their 2-3% p.a. target range **(0.5 mark)**
- this was then followed by two years of accelerating inflation **(0.5 mark)** caused by two main factors:
 - The major fiscal stimulus in 2020 and 2021 during the COVID pandemic; **(0.5 mark)**
 - The outbreak of war in Ukraine, disrupted the supply of several important commodities such as oil, gas, and wheat, increasing their prices, **(1 mark)** and affecting inflation across a wide range of goods and services. **(1 mark)**
- in response to the increase in inflation, most of the major central banks rapidly increased short-term interest rates **(0.5 mark)** and also sold large amounts of government bonds. **(0.5 mark)** which increased the yield on government bonds. and reduced returns on bonds (Quantitative tightening) **(0.5 mark)**.
- **Bonds:** the return on bonds has exceeded the return on cash over most of the last 30 years **(0.5 mark)** because investors usually and rationally require a term premium for investing their funds for longer **(0.5 mark)** but the margin has varied over time, due to shifts in monetary policy **(1 mark)** such as quantitative easing where central banks suppress bond yields **(0.5 mark)** by buying a large proportion of the bonds offered to the market **(0.5 mark)** in order to reduce the cost of long



term debt **(0.5 mark)** and encourage more investment spending by business **(0.5 mark)** and boost growth of the economy or prevent recession **(0.5 mark)**

- there has been a significant shift in the relative returns of growth assets such as Australian equities international equities and property securities. **(0.5 mark)**
- **Australian equities:** Over the longer 30-year period Australian equities have outperformed international equities but this position has been reversed in the last 10 years. **(0.5 mark)** The main explanation of this lies in the very high rates of return on technology-based stocks in the US equity market, which in turn makes up in excess of 60% of the global equity market. **(1 mark)** The tech sector is a much smaller proportion of the Australian equity market, **(0.5 mark)** which tends to be dominated by banks and mining companies, whose return on equity can be volatile **(0.5 mark)** and influenced by cyclical factors and a high degree of operating or financial leverage **(1 mark)**.
- the return from investing in Australian equities has exceeded that from investing in bonds **(0.5 mark)** and the excess return has varied over time **(0.5 mark)**.
- **International equities:** the excess return from investing in international equities over the last 30 years was lower than that of the Australian equity market, **(0.5 mark)** due mainly to a major market decline in the first few years following 2000 (the bust of the Tech Boom) **(0.5 mark)**. It has since improved in the latter part of the last 30 years due to the strong growth in US tech-related stocks **(1 mark)**.
- **Property securities:** Returns have been lower than in recent years because:
 - companies or trusts issuing property securities sometimes have significant financial leverage which costs more when interest rates are rising as they have done in the last year or more. **(0.5 mark)**
 - their prices are very sensitive to the rise in bond yields which has occurred. **(0.5 mark)**
 - there has been a fall in occupancy rates and rental income in some sectors such as office properties following the 2020 COVID pandemic. **(0.5 mark)**

Maximum 10 marks



(b) the use of the standard deviation of returns as an indicator of risk and any advantages and disadvantages of using this indicator; (3 marks) LO 1.1, 1.2, 2.1, [M3] [M4]

The relative stability of the standard deviation of returns, compared with the returns themselves, has led many analysts to use it as a proxy for risk, assuming that such stability makes it easier to forecast the future standard deviation of returns. **(1 mark)** The standard deviation of return has been widely used in models such as the mean-variance optimisers used for portfolio asset allocation. **(1 mark)**

The standard deviations of returns have mostly been less variable than the returns over the last 30 years **(0.5 mark)**. An exception to this has been the more significant increase in the standard deviation of the returns on property securities over the last five years. **(0.5 mark)**. This was due in part to the strong influence that rising and falling bond yields have on the valuation and market pricing of property securities. **(1 mark)**.

Disadvantages:

- using the standard deviation of the return as a measure of risk in an asset does not measure the probability of the return failing to meet an investment objective or benchmark **(1 mark)**.
- Investors may gain a false sense of comfort from relying too heavily on standard deviation **(1 mark)**

Maximum 3 marks

c) the use of the probability of negative returns over 1-year periods as an indicator of risk and any advantages and disadvantages of using this indicator; (3 marks) LO 1.1, 1.2, 2.1, [M3] [M4]

The risk of negative returns in any particular asset class in the future is sometimes estimated using historical data on the percentage of time that 1-year returns have been negative over a long period in the past, such as the last 30 years as shown in the table. **(1 mark)** If this approach is adopted, the



data in the table indicates that the risk of a negative return in cash and government bonds is very low and therefore these sorts of assets could be used as a defensive allocation for a portfolio where the stability of one-year returns is required to meet investment objectives. **(1 mark)** The likelihood of a negative one-year return in the growth asset classes such as Australian equities international equities and property securities appears to be much more significant. **(0.5 mark)** These statistics may imply a view that these asset classes pose a greater risk to the overall portfolio return over a short period such as one year. **(1 mark)** Given that many investment portfolios have a longer period over which their investment objective is set such as 5 years or 10 years it would be more pertinent to calculate the probability of negative returns on each asset class over such longer periods. **(1 mark)** When this is done it is generally observed that the likelihood of a negative return on equities tends to be reduced significantly over longer periods. **(1 mark)**

Even if analysis over a longer period is undertaken, caution still needs to be exercised. **(0.5 mark)** The historical data may not necessarily be a good indicator of what may happen over the next 5, 10 or 30 years. **(0.5 mark)** When considering the outcome of such historical analysis consideration needs to be given to the factors which may have caused the pattern of returns that have taken place. **(1 mark)** such as those discussed in part (a) **(0.5 mark)**.

Disadvantages of using the probability of negative returns over 1-year periods as a measure of risk are:

- it does not provide a measure of the severity of the risk **(1 mark)**
- it does not indicate the time taken to recover from the downturn **(1 mark)**

Advantages:

- gives the investor an idea of how consistent the returns are **(0.5 mark)**.
- relatively easy to calculate **(0.5 mark)**.

Maximum 3 marks



(d) other statistical information about the returns that would you like to have seen in order to consider both return and risk. (4 marks) LO 2.2,5.1,5.2 [M4] [M6]

Measures such as the standard deviation of returns, the likelihood of negative one-year returns and the statistics on historical drawdowns, may be taken as measures of risk in each asset class, but they do not encompass relationships between asset classes. **(1 mark)**

Measures referred to as risk adjusted returns – such as the Sharpe ratio or Information ratio which relate the excess returns to the variability of returns or excess returns can be used to compare the relationship between return and risk (as measured by volatility) across asset classes. **(1 mark)**

Measures of past returns and risk can be used to assist in the estimate of future returns and risk in models. **(0.5 mark)** This must be done with care due to the instability of the measures of return and risk over time **(0.5 mark)** and the degree of uncertainty in the influence of various factors such as fiscal and monetary policy, **(0.5 mark)** as well as politics and war, on economies and markets. **(0.5 mark)**

It would be useful to have some statistical information on the correlation between asset class returns over time such as that provided by the Pearson correlation coefficient, **(0.5 mark)** which is easily measured but requires care in its interpretation. **(0.5 mark)** because it is likely that the returns of each asset class are not unaffected by factors affecting the returns of other asset classes. **(1 mark)**

It can be used as input to models such as Markowitz's mean-variance optimisers used to derive asset allocation for multi-asset class investment portfolios, **(0.5 mark)** but there are some limitations on conclusions that can be drawn from such models. **(0.5 mark)**

The Pearson correlation coefficient is a measure of the strength of linearity between two random variables. **(0.5 mark)** It has some limitations in evaluating the strength of the relationship between two or more variables such as not capturing nonlinear effects. **(0.5 mark)**

There are two main issues with the use of correlation statistics:

- they are a numerical measure of dependency and tell part of a story but do not fully characterise the dependency structure; **(0.5 mark)** and



- independent random variables have zero correlation, but if zero correlation is measured under any of the three methods, it does not necessarily imply independence of the random variables. **(0.5 mark)**

If two random variables, A and B, say, are (linearly) correlated, then possible relationships include:

- A causes B;
- B causes A;
- A and B are consequences of a common cause, but do not cause each other;
- A causes B and B causes A, and
- there is no connection between A and B; the correlation is a coincidence.

(1 mark for all of the above)

This means that correlation does not imply causality. **(0.5 mark)** Thus, examining past data may show a correlation among variables but that does not mean they are causally linked. **(1 mark)**

Other statistics which candidates may indicate are:

- The proportion of time in which the return was positive. (Batting average) **(0.5 mark)** This measure provides investors with an idea of the consistency of the performance of the asset classes. **(0.5 mark)**
- Average probability of negative return over rolling X-year periods where for example $X = 3, 5$ or 10 . **(0.5 mark)** This measure provides investors with an idea of consistency of returns. **(0.5 mark)**

Maximum 4 marks

END OF QUESTION 2: MARKING GUIDE



QUESTION 3

(20 marks)

Explain:

- (a) why the equity risk premium exists; (5 marks)
- (b) the size of the equity risk premium during various periods of time; (5 marks)
- (c) the equity risk premium puzzle; (5 marks)
- (d) other factors which may, in practice, influence the size of the observed equity risk premium. (5 marks)

(Command verb: Explain (Level 4 – Analyse) Give an account of something with the goal of clarifying it to someone or making something easier to understand. Calls for even more information than describe, showing that you can convey ‘why’ or ‘how’ or ‘so what’. A connection is expected between the item(s) and something else.)

Explain:

(a) why the equity risk premium exists; (5 marks) LO 2.1,2.2 [M4]

The equity risk premium is the reward for the additional risk of investing in equities instead of fixed interest or cash. **(0.5 mark for shorter definition)**

The equity risk premium is the difference (usually an excess) between the total return (capital gain and income reinvested) on equities and the total return of either short-term credit risk-free fixed interest or cash over a defined period, often referred to as the risk-free return. **(1 mark for this more complete definition)**

The equity risk premium exists because investors require higher returns to take on the additional risks compared with risk-free securities. **(1 mark)**

Given the existence of additional risks in equities, rational, risk-averse investors would not invest in equities if the expected return did not exceed that of credit risk-free fixed-interest assets or cash. **(1 mark)**

An explanation for the observed equity premium is that it reflects the difference in the level of risk associated with equities, such as the variability of income and capital gain, compared with the more stable income and capital of fixed interest or cash (money market securities). **(1 mark)**

The assumption is that more volatile equity securities require higher returns to attract investors. **(0.5 mark)**



It is assumed that a market dominated by rational risk-averse investors will price equities such that the return exceeds the 'risk-free' rate by a risk margin sufficient to compensate them for the risk taken. **(1 mark)**

It has been observed that investors are more concerned by losses than they are pleased with gains of equivalent size. **(0.5 mark)** Since equity prices are typically more volatile than bond prices in the short run, this may dissuade investors from buying equities unless the return premium is sufficiently high to compensate for the variation in its potential size during various periods of time. **(1 mark)**

Maximum 5 marks

(b) the size of the equity risk premium during various periods of time; (5 marks) LO 1.1,1.2,2.1,2.2 [M3] [M4]

When measured over very long periods, there is substantial evidence that the equity risk premium is significant and persistent. **(0.5 mark)** For example, it has been estimated (Mehta 2008) that over the preceding 116 years, the average return on US equities has been approximately 7.67% per annum, while the return on Treasury bills has been only 1.31% per annum — implying an equity premium of 6.36% per annum, with similar patterns observed in other countries around the world. **(0.5 mark for quoting this from the Module)**

The size of the equity risk premium has been observed to vary significantly over time, **(0.5 mark)**, particularly over shorter periods such as 5 years or 10 years as indicated in the Barclays Equity Gilt study **(0.5 mark)**

The equity risk premium can vary over time to reflect:

- The economic cycle: This is because movements in GDP will generally affect the revenue growth of companies within the economy **(0.5 mark)** and their valuation by equity market participants **(0.5 mark)**
- Changes in interest rates due to shifts in inflation expectations **(0.5 mark)** or monetary policy **(0.5 mark)**
- Investors' confidence level: The additional premium required for investment in equities rather than bonds or cash may change to reflect:
 - changes in investors' expectations **(0.5 mark)**
 - changes in investors' confidence in
 - particular equities **(0.5 mark)**
 - the equity asset class in general **(0.5 mark)**
 - financial and economic conditions in general **(0.5 mark)**
 - changes in their risk and return profiles **(0.5 mark)**



- Perceived risk levels: If investors perceive equities as higher risk, their perceptions may change over time due to company performance **(0.5 mark)** or performance of similar companies, **(0.5 mark)** so that the required equity risk premium may change. **(0.5 mark)**

Note to markers: To get full marks, candidates should explain the factors affecting the size of the equity risk premium.

Maximum 5 marks

(c) the equity risk premium puzzle (5 marks) LO 2.1, 2.2, [M4]

The equity premium puzzle, which was identified by some academic researchers in the 1980s, **(0.5 mark)** is that the levels of the equity premium observed in various equity markets seem too large to be explained solely by the phenomenon of risk aversion attributed to rational investors, **(1 mark)** using the capital asset pricing model that had been developed in the 1970s as a description of equity security returns as a linear function of the excess of the observed equity market return above the return on credit risk-free bonds. **(1 mark)**

The equity risk premium puzzle has been widely researched to find a plausible explanation for the gap in returns between equities and credit risk-free fixed interest. **(0.5 mark)** One explanation for the puzzle was that myopic loss aversion by rational investors can be used to explain an abnormally large difference in returns between equities and bonds. **(1 mark)** Myopic loss aversion is where investors are more risk averse if they are focussed on shorter investment periods such as one year, where they focus on the risk of a negative return over one year and demand a higher return on equities to compensate for the risk. **(1 mark)**

Since stock prices are typically more volatile in the short run, **(0.5 mark)** this may dissuade myopic investors from buying stocks unless the return premium on stocks is sufficiently high to compensate for this loss aversion **(0.5 mark)**

It was observed that in practice many investors have longer expected periods of investment and so ought not to demand as high an equity return as would be warranted by risk aversion over shorter periods. **(1 mark)**

An assumption of this analysis is that investors evaluate their portfolios based on the last 12 months of returns (myopic), rather than over longer timescales. **(1 mark)**

Therefore the observed past equity premium is consistent with myopic loss aversion **(0.5 mark)** and the substantial equity premia observed in the data in equity markets are so high since they take into account this aversion to short-term losses. **(0.5 mark)**



To illustrate this the following information can be considered:

- The probability of negative returns for equities reduces significantly when a longer term horizon is considered. For example, the 1-year probability of negative returns is around 25%, while the probability of a total return being negative over a 10 year period is often close to zero. **(1 mark)**
- Some studies have shown that historical returns for the S&P500 have been positive for any 30-year rolling time period in the last 100 years (which includes events such as major wars or depressions). **(1 mark)**

In practice, the equity risk premium has been observed in several major equity markets over several decades and it has varied from very low or even negative levels to high levels in excess of 6% p.a. **(1 mark)**. It is not clear that any particular level of equity risk premium is the correct level **(0.5 mark)** and so the existence of the puzzle may also be in doubt. **(0.5 mark)**

. Maximum 5 marks

(d) other factors which may, in practice, influence the size of the observed equity risk premium. (5 marks) LO 3.1,3.2 [M5]

Other factors which may, in practice, influence the size of the observed equity risk premium are:

- changes in the corporate tax rate over time **(0.5 mark)**
- short-term market disruptions during periods of high financial market stress or uncertainty (such as during the GFC or during COVID) where the required ERP increases as investors demand higher compensation for taking on risks due to increased risk aversion. **(1 mark)**
- major shifts in inflation and in central bank monetary policies so that the required ERP may increase due to higher uncertainty about returns on cash and fixed interest. **(1 mark)**
- interest rates- if lower will reduce the required equity risk premium **(0.5 mark)** due to the demand for equities increasing **(0.5 mark)**
- leverage effects in equities such as operating leverage **(0.5 mark)** and financial leverage **(0.5 mark)**
- economic cycles: recessions can significantly influence the investors' risk appetite **(0.5 mark)** and thus increase the equity risk premium required for them to invest in equities. **(0.5 mark)**



- geopolitical events: such as wars and trade disputes may increase the required equity risk premium **(0.5 mark)** by disrupting the activities of companies that operate internationally **(0.5 mark)**.

The two leverage effects occur at the level of the individual listed equity security company and they vary from company to company **(0.5 mark)** but the effects can be observed across the whole of the equity market. **(0.5 mark)**

When the revenue of a company increases (or decreases) at a faster rate than the operating costs or debt financing costs, the effect on the net return on shareholder funds is magnified. **(1 mark)**

These leverage effects can be the source of higher returns on shareholder funds and ultimately returns to equity investors. **(0.5 mark)** They are a significant factor in the greater volatility in returns to shareholders since any volatility in revenue leads to magnified volatility in the net earnings of the company. **(1 mark)**. The volatility in revenue relative to fixed costs or debt financing costs may be sufficient to cause negative net income (losses) for equity owners. **(0.5 mark)**.

The return on shareholders' funds is, therefore, linked to the growth in the company's revenue and profit. **(0.5 mark)**. To the extent that the company is leveraged, the effect on dividends and capital growth of changes in company revenue and profit will be magnified or leveraged. **(0.5 mark)**

The use of leverage in many equity investments is likely to be an important factor that explains both the higher observed returns on most equity assets versus debt assets as well as the higher observed volatility of returns, especially where the assets are listed and traded on an exchange. **(1 mark)**

Maximum 5 marks

END OF QUESTION 3: MARKING GUIDE



QUESTION 4

(20 marks)

You are an investment consultant advising the Board of Trustees of a defined contribution superannuation fund (the Fund). The Fund offers members two investment options which have multi-asset class portfolios:

1. a growth-oriented option for most working-age members; and
2. a more defensive option for members in retirement and drawing a pension from their account or near retirement.

Each of these portfolios has significant asset allocations to unlisted assets, which are held via open-ended funds managed by external investment managers. The Board believes that it should seek to add value for members by employing active investment managers who can demonstrate a capacity to persistently achieve excess returns above appropriate asset class benchmarks. The current asset allocation of the investment options is set out in the table below:

Investment option:	Asset allocation as of 30 June 2023 (% of total)	
	Defensive	Growth
Listed equities	15	30
Private Equity	5	10
Unlisted real estate and infrastructure		
Office properties	15	20
Retail properties	5	10
Other real estate	5	10
Infrastructure	10	10
Liquid fixed interest	40	7
Cash	5	3
Total	100	100

The investment options have daily unit prices reflecting the valuation of the assets and members are permitted to add to their accounts or withdraw from them on any business day. The Board has asked you to provide a report on:

- A. Valuation of unlisted assets and how it affects unit pricing of the investment options;
- B. Performance review of the external investment managers of the unlisted assets; and
- C. Questions to be asked of the external investment managers in relation to:
 - i. Their valuation policies; and
 - ii. Where they are underperforming their benchmarks, factors that they have identified that may be contributing to underperformance.
- D. Any recommendations for matters that should be included in the Board's Investment Policy Statement.



The questions that you need to address are:

- (a) Discuss the GIPS provisions that should be applied to the valuation of unlisted real estate assets held by the Fund, having regard to the unit pricing needs of the Fund; **(6 marks)**
- (b) Propose a process for assessing the performance of external investment managers who are managing unlisted infrastructure assets for the Fund; **(10 marks)**
- (c) Suggest two areas for review in the Investment Policy Statement of the Fund to ensure that issues for unlisted assets arising from current economic and market conditions are being attended to in the interests of all members of the Fund. **(4 marks)**

Marking Guide

- (a) Discuss the GIPS provisions that should be applied to the valuation of unlisted real estate assets held by the Fund, having regard to the unit pricing needs of the Fund; (6 marks) LO 3.1, 7.1, 7.2 [M5] [M8]**

(Command verb: Discuss (Level 2-Understand) Write about a subject or topic taking into consideration issues and ideas. Provide more than one fact or observation relevant to the topic.)

GIPS is the Global Investment Performance Standard (GIPS) developed in the USA and adopted by most investment management firms and their industry associations, around the world, **(0.5 mark for quoting this from Module 8)**

GIPS has a series of specific provisions related to investment performance measurement for portfolios that include real estate because real estate assets are less liquid **(0.5 mark)** and less frequently priced by the market than assets such as equities or fixed interest. **(0.5 mark)** Since the measurement of performance depends on the valuation of assets in portfolios where market transaction prices are not often available, the GIPS provisions will have an impact on the valuation policy adopted by the Board or its external investment managers for the unlisted real estate assets.

The GIPS provisions relating to unlisted real estate assets are:

- There should be a valuation of the assets at least every 12 months; **(0.5 mark)**
- The valuation should be conducted by an Independent qualified valuer; **(0.5 mark)**



- There should also be an independent financial audit of the entity holding the assets (the open-ended fund managed by the external investment manager) **(0.5 mark)**

Given that the Fund needs to set a unit price for its investment options every business day **(0.5 mark)**, it is possible that the valuation of assets that are valued annually may be out of date and not reflect current market conditions **(0.5 mark)** and may not reflect fair value to the members of the fund. **(1 mark)** If so, this will lead to inequity between members who are adding to their accounts and those who are withdrawing from their accounts. **(1 mark)**

The Board will need to consider this issue and may decide to adopt an additional valuation process that updates the unlisted real estate valuations more frequently. **(1 mark)** This could include asking the external investment managers to provide more frequent valuations of their open-ended funds using methods **(0.5 mark)** that take into account shifts in long-term bond yields or rental vacancies in the properties. **(1 mark)**

6 marks maximum

- (b) Propose a process for assessing the performance of external investment managers who are managing unlisted infrastructure assets for the Fund; (10 marks) LO 3.1 , 8.2, 8.3, 8.4 [M5] [M9]**

(Command verb: Propose (Level 6 – Create): Select and communicate a solution, action, or range of possible solutions/actions. Rationale, reasons, or justification must be included.

The assessment of the performance of external investment managers who are managing unlisted infrastructure assets for the fund is effectively a process that leads to a decision to either retain or not retain the investment managers. **(0.5 mark)** It is effectively the same as the initial assessment and selection of the investment managers. **(0.5 mark)**

An important part of this process is to evaluate whether any excess returns relative to an appropriate benchmark are:

- sufficient to justify the level of fees being paid to access the skills required to achieve the excess returns (there are passive index funds available in the infrastructure asset class); **(1 mark)** and
- whether they have been due to skill or circumstance (luck) **(1 mark)**



While it is important to recognise the limitations of the use of past performance data to forecast future performance, **(0.5 mark)** it is also important to have a sound understanding of past performance, if only to ask questions about the investment process that gave rise to the performance. **(1 mark)**

There is evidence that active investment manager performance relative to benchmarks is not persistent over time. **(0.5 mark)** This is the case in most asset classes and infrastructure is no exception. **(1 mark)**

This indicates that quantitative analysis alone will not be sufficient to assess whether the investment manager has sufficient skill to achieve excess returns. **(1 mark)**

Therefore the assessment process should go beyond quantitative analysis and identify investment management skill which is defined as the quality of investment decisions. **(1 mark)** These in turn depend on:

- the inherent quality of the process, **(0.5 mark)**
- the quality of the people working on the process ; **(0.5 mark)** and
- the quality of business management acting to support or improve the current and future quality of the process. **(0.5 mark)**

A systematic approach to the qualitative assessment of both the investment management process and investment personnel operating that process is needed to assist with the successful identification of skill **(0.5 mark)** because they are the likely sources of good portfolio decisions. **(1 mark)**

It is very difficult to identify skill in investment managers. **(0.5 mark)** However, a quantitative analysis of past performance combined with a qualitative analysis will provide a wholistic view of the investment manager. **(0.5 mark)**

It is therefore proposed that the assessment process should comprise both a quantitative analysis of the investment manager's performance and a qualitative assessment of the likelihood of persistent good performance in the future. **(1 mark)**

It is proposed that the quantitative analysis be conducted over as long a period as possible and comprises measures of:



- return; **(0.5 mark)**
- excess return relative to an appropriate benchmark (has the manager been able to outperform the benchmark historically?) **(0.5 mark)**
- the proportion of time over which the excess return was positive (or batting average which is an indicator of consistency and the probability of return falling short of the investment objective or benchmark) **(0.5 mark)**
- the information ratio (excess return per unit of the volatility of excess return) **(0.5 mark)**
- excess return per unit of fees paid. **(0.5 mark)**

The qualitative assessment process should comprise several steps:

- collection of detailed descriptions of the processes and people who manage the processes via a very detailed questionnaire **(0.5 mark)** to allow assessment of the completeness and quality of the investment process **(0.5 mark)** and the experience and expertise of the people making the investment decisions **(0.5 mark)**
- interviews with several investment personnel at different times where difficult questions about the portfolio composition and its effect on returns and performance relative to benchmark are posed; **(1 mark)**
- The questions are not necessarily difficult – managers are being asked about what they do and how they do it to assess whether they are competent and clear on what they do and whether their actions and the portfolio composition are consistent with their stated investment philosophy and process; **(1 mark)**
- Potential questions may be:
 - Which valuation models are used to value assets? **(0.5 mark)**
 - How are assumptions set for rates of growth of revenues, expenses (including terminal assumptions)? **(0.5 mark)**
 - How is the discount rate set? **(0.5 mark)**
 - How are assets ranked in order of attractiveness, making allowances for risk and uncertainty? **(0.5 mark)**
 - Is sensitivity or scenario analysis used to test the assumptions? **(0.5 mark)**
 - How does the manager determine the weighting of assets in the portfolio? **(0.5 mark)**
 - How does the manager decide to sell or reduce an asset's weighting in the portfolio? **(0.5 mark)**



- a systematic and sceptical assessment of the information received against a well-established set of evaluation criteria to assess whether the past returns achieved can be explained by the investment process used and the investment personnel driving the process; **(1 mark)**
- a peer review of the information received and the evaluation that has been made, by a person of at least equivalent experience in the qualitative assessment of investment managers. **(1 mark)**
- Other qualitative factors which may be indicators of performance are:
 - Clarity of stated investment philosophy upon which the investment process is based **(0.5 mark)**
 - Clarity of the investment process for valuing and selecting assets and incorporating them in portfolios **(0.5 mark)**
 - Effectiveness of risk management procedures in various market conditions **(0.5 mark)**
 - Stability of the investment process over time **(0.5 mark)**
 - Clarity of accountability for decisions **(0.5 mark)**
 - Remuneration and incentives and their alignment with achieving the investment objectives of portfolios **(0.5 mark)**
 - Turnover of investment staff and stability of the investment decision making team over time **(0.5 mark)**

Maximum 10 marks

- (c) Suggest two areas for review in the Investment Policy Statement of the Fund to ensure that issues for unlisted assets arising from current economic and market conditions are being attended to in the interests of all members of the Fund.**

(4 marks) LO 9.3,9.4 [M10]

(Command verb: Suggest (Level 6-Create) Put forward for consideration solutions or actions, with reasons or justification.)



Current economic and market conditions are having an impact on the valuation and market prices of several unlisted asset classes such as real estate, infrastructure, and private equity, all of which represent significant asset allocations in both of the investment options. **(0.5 mark)** The frequency of valuations of these assets is much less than the required frequency of valuations of units in the investment options. **(0.5 mark)** Areas for review in the Investment Policy Statement of the Fund to ensure all members' interests are being met could include:

- the Fund's statement of Investment Philosophy—i.e., the Board's beliefs regarding the behaviour of investment markets, members, and investment managers, to ensure that there is not a mismatch between the interest of members and the nature of the assets held in the investment options. **(1 mark)**
- the statement Investment Process to ensure that the portfolios of the investment options are built and managed to meet members' needs. **(1 mark)**
- the valuation policy for unlisted assets. **(1 mark)**
- the process of stress testing unlisted asset valuations and liquidity. **(1 mark)**
- the process of shifting asset allocation in response to shifts in expected investment market conditions. **(1 mark)**
- meeting requirements of any relevant regulators regarding the investment in and valuation of unlisted assets. **(1 mark)**
- the process for deciding the asset allocation to unlisted, less liquid assets. **(1 mark)**
- portfolio risk management limits such as
 - minimum or maximum in an asset class **(0.5 mark)**
 - minimum or maximum in an industry sector **(0.5 mark)**
 - or single issuer **(0.5 mark)**
 - or geographic region **(0.5 mark)**
- the governance process for dealing with breaches of portfolio risk management limits **(1 mark)**
- ongoing processes such as investment performance measurement as well as monitoring the compliance of investment managers with their investment mandates. **(1 mark)**
- reporting requirements for investment managers **(1 mark)**



Maximum 4 marks

END OF QUESTION 4: MARKING GUIDE

END OF MARKING GUIDE