

ASSET LIABILITY MANAGEMENT

EXAM MARKING GUIDE SEMESTER 2 2023



Marking Guide

This exam represents 80% of the available marks for the Asset Liability Management subject. The remaining 20% comes from the assignment.

Question	Syllabus Learning Objective	Page Reference in Course Notes	Total Marks	SA	A	H
1	1.1, 1.2, 3.3	2.2.1, 2.2.2, 5.5.2, 5.5.3, 6.4.3, 10.4.3	14	6	8	0
2	4.1, 5.2, 5.3, 6.2, 6.7	8.5, 9.1.1, 9.3.3, 9.3.4, 9.4.3, 9.4.4, M11.2 to 11.7	18	2	4	12
3	2.1, 2.5, 3.4, 5.1, 6.2	3.2.2, 4.4, 9.3.4, 11.5	20	6	14	0
4	2.9, 3.2, 6.2, 6.3, 6.5	6.2.5, 6.3.2, 11.3, 11.10	28	0	22	6
Exam			80	14	48	18
Assign			20	16	4	0
Subject			100	30	52	18
Target			100	30	50	20

SA – Simple Application 30%

A – Application 50%

H – Higher order/ Judgement/Evaluation 20%

**Notes:**

Copying and pasting is allowed but the student needs to address the specified scenario to pass the examination. This will require editing any copied material. A well-prepared student is able to focus on applying their knowledge to the scenario provided and presenting logical arguments to support their findings.

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 is also provided in the Student Hub.

Please note that many of the answers in this marking guide go well beyond what is required to gain full marks in the question. This is done deliberately to give students and markers a sense of the wide range of acceptable answers that students might give to a question.

Please read the Chief Examiner's Report for more insight on the quality of the actual student answers and their areas of strength and weakness. Self-assess your own knowledge and capabilities in each area.



QUESTION 1: MARKING GUIDE

(14 marks)

Learning Objectives

1.1	Explain, in general, actuarial models as part of actuarial advice, their inputs and outputs, and how they are affected by professionalism and the external environment	A
1.2	Recognise the qualitative elements of providing actuarial advice	SA
3.3	Compare valuation methods including discussing assumptions and evaluating limitations	SA

You are considering two assets for investment, with details below as at 1 July 2023:

Government bond

Face Value \$1,000, coupon 5% p.a. fixed, payable annually in arrears at 30 June, for a remaining term of 10 years.

Company share

Share listed price \$1,000 with a dividend of 5% p.a. paid for the most recent financial year. Dividends paid annually in arrears at 30 June.

Central bank's long term inflation target is 3% p.a. and current cash rate is 3% p.a.

Questions

a) For each asset

- i. **Describe** a simple method to value the asset, including the assumptions that are implied by the method

4 marks SA LO 3.3 M5.5.2, 5.5.3, Revision bonds, 6.4.3 equities
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Bond (max 2 marks)

Present value of future cash flows, that is, the present value of future interest payments and return of principal, at selected single discount rate, d . (1)



This simple approach assumes:

- Can re-invest the coupon at the same rate (the discount rate). [0.5]
- Bond is held to maturity [0.5]
- Tax and expenses are ignored (or built into the selected discount rate) [0.5]
- No risk of default as government bond (or risk built into discount rate). [0.5]
- No variation in actual inflation or cash rates over next 10 years (or risk built into discount rate). [0.5]

Share (max 2 marks)

Given the limited information available, use a Dividend Discount Model – the Gordon Growth Model, which requires dividend D , a discount rate k and annual growth rate g , values the future dividend payments as a Perpetuity (1)

Or, stated the formula $\text{Price} = D/(k-g)$ and defined each term (1)

This formula assumes:

- Company exists indefinitely, with same dividend policy, so that a perpetuity can be used [0.5]
- Dividends paid at end of each year [0.5]
- Company Growth rate and dividend growth rate constant g in perpetuity [0.5]
- No changes to business or economy generally that affects capacity to generate this dividend amount [0.5]
- Investment risks can be allowed for simply by increasing the discount rate [0.5]
- No external factors interfere with company, market pricing etc [0.5]

ii. **Determine** the values for the input assumptions you will use with this method

4 marks A LO 3.3 M2.2.2, 10.4.3
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Bond: (0.5 marks each distinct point leading to specific figure max 2 for Bond)

- Coupon and term are not assumptions made by student, they are facts, no marks for restating
- Cash rates and inflation rates were given already, did not need determining so no marks for them



- **Discount rate** is the rate I require from the government bond over the 10 years.
- Risk free real return is currently 0%
- As it is a govt bond I do not allow a credit risk premium
- I do allow for inflation as I require a real return [0.5] noting inflation currently 3%
- Set discount rate as $0\% + 3\% = 3\%$ (if this is given in next question, pay marks here)
- There is also risk inflation changes as it is a fixed coupon so real return falls if inflation rises in future
- The bond term is 10 years so inflation risk is likely so I will add a term premium
- Risk Free Real + Expected Inflation + Inflation Risk (term premium) = $0\% + 3\% + 1\% = 4\%$

Share (0.5 marks each distinct point leading to specific figures for D, g, k max 2 for Shares)

- **Initial D** = \$50 given, not an assumption by student, so no marks for restating
- Dividend rate continues at 5% of share value ie no variation
- **Annual growth rate g** = 3% as for inflation, and is 3% indefinitely, ie no variation
- **Discount rate** allows for risk of investment. So should be
 - risk free real rate plus inflation plus equity risk.
 - I assume $0\% + 3\% + 5\% \text{ ERP} = 8\%$ (if this is given in next question, pay marks here)
 - **Or**, Risk Free Real + Expected Inflation + Inflation Risk (term premium) + equity Risk = $0\% + 3\% + 1\% + 5\% = 9\%$
 - Or, Dividend Yield + Dividend Growth = $5\% + 3\% = 8\%$
 - Or, Dividend Yield + Expected Dividend Growth + Expected Capital Growth = $5\% + 3\% + 3\% = 11\%$
- ERP is a best estimate/based on past markets/a subjective amount, so student might select any number



b) Calculate a value for each asset.

2 marks A LO 3.3 M2.2.2, 10.4.3

Bond Workings max 1 mark check their result for their given discount rate

\$50 $t=1$ until $t=10$, \$1,000 at $t=10$. Calculate present value at discount rate 3% **(0.5 layout method in words or formula with inputs)**

So present value \$1171 **(0.5 if stated result in \$ correct for method and inputs)**

(Student may lay out more details)

D	Value
3%	\$1171
4%	\$1081
5%	\$1000
6%	\$926

Share Workings max 1 mark Check their result for their given D, k, g

$50 / (8\% - 3\%) = 50 / (5\%)$ **(0.5 for layout of formula with inputs)**

= 1,000 (this is the price I would pay) **(0.5 if stated result in \$ correct for method and inputs)**

	Initial div	50	Growth rate g		
			3%	4%	5%
		4%	5,000		
		5%	2,500	5,000	
Discount rate k		6%	1,667	2,500	5,000
		7%	1,250	1,667	2,500
		8%	1,000	1,250	1,667
		9%	833	1,000	1,250
		10%	714	833	1,000



c) Explain how you have incorporated risk into your valuation methods.

2 marks A LO 3.3 M10.4.3

Must address how they have/have not incorporated risk in calculations above. Not how they WOULD incorporate risk.

Bond: Max 1 mark – relevant risk 0.5 and how it was incorporated (or not) 0.5

I have made an allowance for risk of inflation rate changing over time (higher) reducing my real return, (0.5) by increasing the discount rate by a term premium (0.5) and therefore reducing the price I will pay.

As it is a government bond I have not made any explicit allowance (0.5) for risk of default (0.5) or liquidity risk (0.5).

I have made no allowance for my other assumptions not being met (ability to reinvest etc) (0.5)

Shares: Max 1 mark

I have included an inflation risk premium (higher discount rate) (0.5) to allow for the risk that inflation rises and my real return is reduced. (0.5)

I captured the risk of equity investment returns being volatile and the success of this company being unknown (0.5) by adding an equity risk premium (0.5) increasing the discount rate (0.5). The ERP I assumed is 4% and is included in the discount rate (0.5)

But there is no allowance (0.5) of my underlying risk free rate and growth assumptions not being met. (0.5)

d) Identify elements of uncertainty that you have not addressed in your methods.

2 marks SA LO 3.3, 1.1, 1.2, M2.2.1, T1

Note only required to identify, not describe or explain

Bond: (0.5 per item, max 1 mark)

- Future cash and/or risk free real rate variations [0.5]



- Future available reinvestment rates being different to assumed discount rate [0.5]
- Future inflation rates variations (beyond my premium) [0.5]
- Sovereign (government) default [0.5]
- Requirement to exit (sell) earlier than maturity [0.5]
- Future changes to tax regime changing net earning rate [0.5]

Shares: (0.5 per item, max 1 mark)

- Future dividend policy changes (up or down) [0.5]
- Future success or failure of the specific company [0.5]
- Change of direction or nature of business of company leading to different growth or dividend outcomes [0.5]
- Market conditions affecting all stocks (eg recession) [0.5]
- Sale of company (delisting) [0.5]
- Future changes to tax regime changing net earning rate [0.5]

END OF QUESTION 1



QUESTION 2: MARKING GUIDE

(18 marks)

Learning Objectives

5.2	Critique each of the theories of investment market behaviour	HO
5.3	Consider how the critiques of the theories will influence the design of methods of selection for assets and asset allocation	HO
6.2	Describe and apply the factors that influence investment strategies	A
4.1	Describe the characteristics of derivatives	SA
6.7	Demonstrate how actuarial techniques and asset/liability modelling may be used to develop an appropriate investment strategy	A

Background

A retail investment fund (the fund) has grown from \$500million to \$500billion in assets over the last 10 years, reflecting net new inflows, performance and a very strong brand awareness. It is projected to reach \$1trillion within the next 10 years.

A board is responsible for all aspects of the investment strategy of the fund. The board's investment philosophy is summed up as:

Our primary goal is to create long term real returns for our investors without undue risk or expense. Short term fluctuations in markets will not drive our decisions. The fund will hold a diverse global portfolio of assets to minimise the impact of losses in any one company, asset class or country.

The board is reviewing their investment strategy. Firstly, they are hiring a General Manager Investments. Two candidates have different theories on successful equity investing.

Candidate 1: "I believe that the listed markets are very good at capturing all relevant information on a stock, so its near impossible to consistently beat the index. The equities allocation should be set up to track the domestic and global indices respectively. This saves cost and ensures we are always on benchmark."



Candidate 2:" I believe that the increasing automation of trades is building- in the programmer's behavioural biases and is leaving space for active analysts who know the companies inside out, to spot and exploit mispricing by the market. The equities allocation should be managed by specialist active managers in each country, to maximise access to on the ground knowledge. There's no limit to the potential outperformance."

Questions

a) Critique the two candidates' theories for the benefit of the board.

6 marks A 3 H 3 marks LO 5.2 M9.1.1, 9.3.3, 9.3.4, 9.4.3, 9.4.4
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Looking for a range of statements that cover arguments both for/against, and a conclusion for each candidate. So Max 3 marks per candidate discussed. 0.5 per part point.

C1's theory is consistent with Modern Portfolio Theory, [.5] that is, that there are sufficient rational investors to make the market rational [.5], and that all information is rapidly incorporate into prices, so the market is efficient [.5]. This is also called the Efficient Market Hypothesis [or 0.5]. C1 appears to believe in a strong or semi strong market efficiency, [.5] which means there are no useful insights from technical or fundamental analysis [.5]. Hence their conclusion to passively hold the index.

The EMH theory has not been proven definitively true [.5], however for very large equities markets like the US or Europe, there are so many stocks and so many analysts it is likely to be a reasonable belief [.5]. Research also suggests active managers do not consistently add value over all time periods [.5], which supports this approach to investing [.5]. However, the idea of 'rapid' incorporation may not mean 'instantaneous', particularly in very volatile markets, [.5] it may be possible to add value by not tracking the index too closely [.5]. For example, leaving out smaller, less volatile stocks in an index may reduce transaction costs but not increase tracking error. [.5] Other researchers have concluded that some observed markets have anomalies that cannot be explained by MPT [.5].

C1 is correct that a passive index tracking approach is cost effective [.5] as there are no investment selection decisions required [.5] and by design will track the index, or benchmark, returns [.5].



C2, on the other hand, takes a behavioural finance approach* [.5] – his theory is that the programmed trading being carried out is not a true application of EMH, but rather decisions based on programming which itself reflects human behaviour and biases [.5]. C2's view of biases in programmed trading is narrow [.5] – there are biases in many other parts of the investment process e.g., relying on broker reports, market news and overconfidence with new trends such as AI [.5]. If the market participants (or algorithms) behaves with bias [.5], market pricing will move away from the 'true' price, or EMH price, [.5] and this mispricing can be exploited by an investor that has no biases but a more dispassionate view [.5], and perhaps a better understanding of the underlying fundamentals of each company [.5] (eg relies on Fundamental Analysis).

Behaviours that get built into programming decisions might be editing (selecting what stocks to look at), segregation (selecting what factors to assess), loss aversion (more sensitive to risk of loss than gain), isolation effect (focus on differences not similarities), etc [up to 1 for examples]

The suggestion to use local active managers is consistent with C2's theory [0.5]. However, the argument that there is no upside limit is an overstatement [.5], and the detailed research required will be very expensive [.5] e.g. company visit and AGM attendance costs.

(* also pay going with Fundamental Analysis as the theory for this candidate, that by applying Fundamental Analysis in more detail they can 'outwit' the pre-programmed trading - provided include some critique commentary eg that research indicates no value add).

b) Propose one candidate as the preferred General Manager Investments to the board, giving your reasons drawing on the board's investment philosophy and the candidate's stated views.

4 marks H LO 5.3 6.2 M-

Student may requote the philosophy or managers stated views. No marks and no penalty for doing so. Looking for both managers to be assessed (1 to 1.5 marks each), board philosophy to be mentioned (0.5) and then a conclusion (0.5 to 1). May argue either way, or declare both poor fit.



The board's view notes it does not want undue risk or expense [.5]. C2's view would introduce both [.5], undue risk to the equity portfolio as a lot of managers will be needed for all the countries (noting board diversifies by country) and may not all prove to be able to outperform the index [.5], plus a considerable cost [.5] to implement and maintain. C2 also believes in exploiting short term fluctuations [.5] in stock prices, which is contrary to the board's view on short term not driving decisions [.5].

C1's view is more aligned with the board [.5], although possible a little more conservative again [.5]. C1 is consistent with the view to minimise risk (as no risk when compared to benchmark [.5]) and minimising costs (as passive tracking is as cheap as possible [.5]), also supports diversification as would hold the entire index globally. [.5]

Therefore I recommend C1 for the GM role [.5].

OR, having discussed both managers, a recommendation alternative

A reasonable expectation of a customer of the fund could be for some level of active management [0.5], given the good historical performance of the fund [0.5]. C1 is 'too passive' to be consistent and C2 is 'too narrowly focused'. I recommend the board reject both candidates as not being in line with the board's requirements [0.5] and to keep looking for a GM that is more in tune with the requirements of the fund [.5].

Or, having discussed both managers, a recommendation alternative

The Board is looking for long term real returns and not constrained by short term volatility [0.5]. C1 is too conservative for the Board's objectives [0.5], I recommend C2 [0.5], but with some constraints provided to ensure risks are controlled to align with Board's risk appetite [0.5].

Currently the fund is invested in equities via listed markets (domestic and global) and fixed interest via unlisted wholesale fixed interest trusts (domestic and global). There are no derivatives employed. The board is open to changing the balance between fixed interest and equities, and potentially adding other asset classes.

c) Explain the asset liability management 5-step process to (re)set the investment strategy including comments on each step that are relevant to the board.



6 marks A 1 H 5 LO 6.7 M11.2 to 11.7

1 mark for all 5 steps correctly named, 0.5 if partial. Remaining marks for description of each step and comments relevant to this Board. Must integrate information about Board or portfolio to get full marks.

Many students copied direct from text book. All sentences relating to superannuation funds, investment choice options or insurers were crossed out as irrelevant and only marked what was left. This usually meant no mention of the board or its portfolio, so could not achieve maximum marks.

1. Identifies needs:

- the board invests on behalf of a large body of investors, and has stated *long term real returns for our investors without undue risk or expense*. So this can remain in place. [.5]
- The investment fund is open ended, so no particular term other than 'long term'; [.5]
- needs liquidity to manage cashflows, but generally expecting net cash flow positive; [.5]
- Board is investing on behalf of others, the liabilities are the investors (clients) accounts [0.5] so matched [0.5], but the board has stated an investment strategy which they must follow [0.5];
- the currency is the domestic currency; [.5]
- timing of cashflows is uncertain; [.5] and
- there are no 'free assets' as all held for the investors. [.5]

2. Sets Objectives:

- The primary goals are as above, turning this into investment objectives could include a real return requirement [0.5], long term timeframe [0.5], no interest in short term fluctuations; but some limits to allowable losses (without undue risk) [0.5]
- Student may give an example – needs to be relevant - A real return of 2% pa more than inflation [.5], over rolling 10 years [.5] with capital losses at most once every 3 years [.5]



3. Determine available strategies:

- Determining the strategy is mostly about selecting appropriate assets (classes) to meet these objectives [.5].
- Within the philosophy being diversified, global range of classes which gives a wide range of possible asset classes and combinations [0.5]
- This will also take into account required liquidity, currency, costs [.5] etc.
- The main variations to assess will be around exposure to equities vs fixed interest [.5] and introduction of other asset classes [.5].

4. Assess available strategies and select one:

- This will be done by modelling outcomes [.5] under the different asset allocation and hedging options and determining which has the best results [.5],
- Finding the strategy with the highest probability of matching the needs covered in step 1 [.5], and delivering the objectives in step 3 [.5].

5. Document and implement.:

- once selected the board should ensure that the strategy is documented [.5] and then delegate to the GM to implement it [.5].
- There may be a phased period if major changes are required [.5].
- Monitoring is essential part of implementation [.5].

d) Describe two ways the board could use derivatives in the future.

2 marks SA LO 4.1 M8.5

Max 1 mark overall for discussing hedging currency:

The obvious first way is to hedge some or all of the currency exposure [.5] in all the non-domestic countries.

I assume all the investors have their liabilities in the local currency [.5], so a degree of matching currency is appropriate. [.5]



However we don't know if the fund was promoted as hedged or unhedged [0.5], so need to be consistent with customer expectations [0.5]. Perhaps offer a second, fully hedged, fund. [0.5]

And/or

Typically the fixed interest assets would be hedged back into local currency [.5] to ensure the returns are aligned with the domestic economy and money [.5] and the capital value is protected in the local currency [.5], for the benefit of the investors who we assume have primarily local currency liabilities [.5].

1 mark overall for managing portfolio exposures or transactions or tactical or similar:

As the fund is large and growing, there is likely to be significant net inflow daily [.5], that requires investing promptly to ensure fully invested [.5]. Derivatives may be used to ensure immediately exposure to the required asset class/country [.5], cheaply [.5], while the actual transactions are carried out over time.

Similarly at times it may not be possible to buy/sell on the actual markets due to lack of participants, (without impacting prices) [.5], and derivatives may assist in modifying net exposure to the target asset without actually trading the asset itself. [.5]

A swap on indices [0.5] may be an inexpensive way to gain exposure to an equity or fixed income index [0.5].

Futures can be used to quickly implement tactical asset allocation decisions between countries [0.5] or between equities vs fixed income [0.5].

Options on equities [0.5] may be appropriate for managing positions on certain stocks [0.5] e.g. covered calls.

1 mark overall for discussing hedging/options to stop downside losses on any asset, class or country:

It is possible to use derivatives for risk management [.5], particularly to hedge against potential downturns in equity markets [.5]. Put options to protect the capital value of the portfolio in this way would be expensive [.5].



As the fund's philosophy is long term investing not influenced by short term fluctuations, it is not likely [.5] the board would take up expensive insurance using derivatives in this way.

Only pay marks for discussing using derivatives speculatively, or to short sell, if it is clearly stated this would be inconsistent with the board's current philosophy.

Only pay marks for discussing using derivatives for liquidity if clearly noted this not likely to be necessary given net growth outlook (so can use incoming cash to fund any outflows or rebalancing transactions)

END OF QUESTION 2: MARKING GUIDE



QUESTION 3: MARKING GUIDE

(20 marks)

Learning Objectives

2.1	Discuss the role of government monetary and fiscal policy	SA
2.5	Explain the principal economic influences on investment markets	A
3.4	Compare long term returns across the three principal asset classes	SA
5.1	Describe the major theories of how investment markets behave	SA
6.2	Describe and apply the factors that influence investment strategies	A

Background

Table 1 Historical returns to 31 May 2023 (%per annum)

Period	Aust listed equity	Global REITS (Hedged to AUD)	Global Fixed Interest (Hedged to AUD)	Cash (Aust)	CPI (Aust) (March 23)
1 yr	2.9%	-14.1%	-2.6%	1.9%	7.0%
3 yrs	11.4%	5.2%	-3.4%	1.1%	4.4%
30 yrs	9.2%	7.5%	6.3%	4.2%	2.6%

Three major events over last 3 years have affected economies globally:

- the UK left the EU in February 2020;
- the Covid global pandemic was declared in March 2020 and is ongoing; and
- the Russia/Ukraine conflict escalated in February 2022 and is ongoing.

One consequence for most economies has been unusually high inflation since 2020, and inflation rates have not yet returned to 'normal' levels.

Questions

- a) **Describe** monetary policy actions that can be taken to address high inflation, and a risk arising from those actions.



4 marks SA LO 2.1 Mod 3.2.2

Max 1 mark for explaining link between interest and inflation, may be done separately as here, or integrated with the actions

Monetary policy actions are those available to government (via the central bank) that can influence demand (and therefore in theory inflation rates) in the economy [0.5]. This is by affecting the quantity of money and credit in the economy [0.5]. OR

To address high inflation, and bring it down, higher interest rates (in theory) reduce demand for goods and services [0.5] as borrowers are constrained in their spending (more income diverted to paying interest) [0.5]. Lower demand should mean no or lower price increases as supply exceeds demand. [0.5]

Max 1 mark each action explained (expecting at least 2)

Central banks have several ways to act:

- **Official interest rates** [0.5] (central bank sets the rate at which it lends to commercial banks [0.5] and this flows onto their rates for loans and deposits [0.5]) Higher interest rates leads to higher borrowing costs, constraining spending, lowering inflation [0.5 if not already explained]
- **Open market Operations** [0.5] (central bank buys/sells government bonds to influence the money supply [0.5], selling bonds to banks decreases their liquid funds and ability to lend. Less lending serves to reduce growth (ie reduce inflation) [0.5]. OR Selling bonds for higher yields) locks up money in the bonds [0.5], reduces consumption and should reduce growth/inflation [0.5].
- Some banks have a **reserve requirement** [0.5] set by the Central Bank or regulator. By creating or increasing the reserve requirement [0.5], commercial banks have less ability to lend [0.5], in theory also reducing demand/growth/inflation [0.5].
- Forward guidance (ie speeches) by the Central Bank [0.5] indicating the intention to combat inflation with higher interest rates in the future may also have an impact, without actually increasing the rates.[0.5]
- **No marks for discussing how to increase demand and inflation by lowering cash rates.**



Max 1 for risk

However, successful action to reduce inflation may also lead to reduced prices [0.5], ie deflation, business failures [0.5] due to increasing borrowing costs and lower profits, unemployment [0.5], housing crisis due to increasing borrowing costs [0.5] or even recession [0.5] over the longer term.

Higher interest rates may also lead to a stronger currency (relative to other countries with lower interest rates) [0.5] which then could mean more imports, less exports, again affecting local business adversely [0.5], but without reducing price of those goods and services [0.5] so less effective than anticipated.

b) Explain the impact of these events and the resulting inflation, on the real and nominal returns from these three asset classes over the last 1 to 3 years.

- Australian listed equity;
- Global REITS; and
- Global Fixed Interest.

6 marks A LO 2.5, 3.4 Mod 4.4

Pay 1 mark for incorporating the observed nominal and real returns into the comments, and/or comparing observed returns to cash or long term returns, or otherwise integrating the provided information.

Pay up to 2 marks per class for sensible comments on how one or more of the events contributed to the return history. No need to mention all events for each class. Sample answer below does not cover all the responses that were acceptable.

Over the last three years, returns have been quite different to long term expectations for these asset classes relative to the risk free rate for cash (and inflation)

Australian listed equities: Over the last year returns of 2.9% are well below inflation 7%, a negative real return of -4.1% [0.5], and not much above cash at 1.9%. [0.5].

- This reflects the market uncertainty [0.5] brought about by the 3 major events listed, plus others (including an arguably overvalued equity market [0.5]), over the last 3 years.



- Immediate response to covid announcement for example, saw many investors exit equities driving prices down [0.5], however this proved temporary and investors recovered a more positive outlook as covid was managed [0.5]. However, the inflation arising from the global factors (supply side) did not abate [0.5], placed many businesses under pressure for input costs [0.5], and reducing demand, leading to a re-evaluation of their long term profitability [0.5].
- Increasing interest rates have also increased borrowing costs [0.5], place them under more pressure and likely contributing to the lower returns in the last year or so [0.5].
- Equity market pricing reflects expectations about the future [0.5], indicating the business outlook is not favourable as at May 2023 [0.5]. Persistent inflation and high borrowing costs would be major contributors to this view [0.5].

Global REITS:

Compared to their long term real return (4.9%pa) [0.5] REITS real return was positive 0.8% over the last three years and negative 21.1% over the last 12 months [0.5]. Indicating the last one or two years have been particularly poor [0.5].

- A negative return of 14.1% suggests capital writedowns [0.5], reflecting reduced rental income [0.5] due to the economic conditions. Property valuations and market outlook affect the trading price of REITS [0.5], and it may be valuations have come down **and** the outlook has weakened [0.5], due to economic factors.
- Covid in particular led to a re-evaluation of the long term need for prime business properties [0.5] (due to increased work-from-home practices), demand for in person retail spaces [0.5], and saw hospitality venues closed for months [0.5].
- Market uncertainty increased with Brexit [0.5], remains high due to the unpredictable outcome in Ukraine and high level of international tension/global conflict/diplomatic disputes [0.5]. Allowing for more risks generally reduces valuations [0.5].
- Further, higher interest rates lead to higher discount rates when valuing properties [0.5], so the values will be adjusted down [0.5].



- Higher inflation may be increasing property operating costs [0.5] at a time that tenant demand is lower [0.5] or government acting to rent control [0.5], so owners cannot pass through their higher expenses [0.5], again leading to weak outlook and lower valuations [0.5].

Global Fixed Interest:

Global fixed interest has had an exceptionally unusual three years [0.5], returning negative 3.4% pa over the three years [0.5].

- Central banks were active lowering interest rates and then purchasing bonds on the open market (quantitative easing) commencing in 2020, to protect economies from the Covid uncertainties and driving down cash rates. This drove up bond prices [0.5]. However, as banks ceased these activities and allowed interest rates to rise bond prices reversed, in some cases significantly as the market had to quickly reset its expectations for future cash rates [0.5]. The rises occurred in early 2020, the fall primarily in 2022, so is captured in the 1 and 3 year figures. [0.5]
- As most bonds continue to meet their coupon and principal repayments [0.5], the primary explanation for the investment losses is a revaluation of the bonds themselves in the new market conditions [0.5].
- There were defaults in corporate bond market [0.5] as business conditions were poor during Covid in many countries [0.5], leading to capital losses [0.5] and perhaps also a reset of the credit risk premium, driving yields up and values down [0.5].
- Obviously exceptionally high inflation means all **fixed** rate bonds are far less attractive [0.5], driving down market value until the real returns are again positive [0.5].



- c) Calculate the 1, 3 and 30-year nominal and real returns for an investor that rebalanced every year to 50% AUD equity and 50% Global Fixed Interest (hedged).

3 marks A LO 3.4 M-

0.5 for each correct figure max 3 Noted as easy 3 marks

Method is simple proportioning AUD equity 50:GFI 50 to get nominal return each period.

Student may generate Real by either method, note similar results

1. Nominal – Inflation; or
2. $(1 + \text{Nominal}) / (1 + \text{Inflation})$

Possible results shown in table

Weight:	50%	0%	50%	0%	0%	100%			
Period	AUD equity	Global REITS	Global Fixed Interest	AUD Cash	AUD CPI				
Return %pa					(March 23)	Nominal	Real (1)	Real (2)	
1 yr	2.90%	-14.10%	-2.60%	1.90%	7.00%	0.15%	-6.85%	-6.40%	
3 yrs	11.40%	5.20%	-3.40%	1.10%	4.40%	4.00%	-0.40%	-0.38%	
30 yrs	9.20%	7.50%	6.30%	4.20%	2.60%	7.75%	5.15%	5.02%	

An individual aged 40 has built up a small portfolio of Australian listed equities over the last three years while working. He has now received a significant inheritance that will enable him to retire now, invest the inheritance and live on the income. He intends to bequest the capital to his children on his death. He has decided to invest all of the inheritance into Australian listed equities, as this has been the best performing asset class over the last 1, 3 and 30 years.

- d) Discuss one bias that may underpin his asset allocation decision.

2 marks SA LO 5.1 M9.3.4

Looking for sensible discussion of one bias, 0.5 per bias named 0.5 for correctly defined, 0.5 for each plausible statement related to this investor and/or their AA decision. No



additional marks if they raise 2 or more biases.

An investor may have biases – tendency to deviate from rational outcomes – which reflect their own behaviours, values and experiences. (0.5 for definition, but not needed)

- This investor has experienced long term positive returns from Australian Listed Equities, certainly much better than from Fixed Interest or Property over that time. (0.5) They will say this supports their decision to use only ALE (0.5), which is **confirmation bias** (0.5) – looking only for evidence that supports their decision. (0.5)
- This investor may have **hindsight bias** (0.5), where because the outcome was good, they believe their initial decision was good (0.5) whereas it may have been a lucky guess). The investor did not 'know' in advance that ALE would be the top performer over the last 3 years, and neither can he 'know' about the next three years [0.5].
- **Status Quo bias** [0.5], is the tendency to stick to current situation regardless of what is best going forward [0.5]. It is quite likely that fixed interest and property will have strong returns in future years [0.5] as inflation reduces, cash rates reduce again and uncertainty reduces [0.5], but this investor will miss out [0.5].
- This could be **conservatism bias** [0.5], under-reacting even as circumstances change around you [0.5], delaying a sensible reaction until too late to capitalise on it.
- There may be a degree of **overconfidence** [0.5], where the investor over estimates his own abilities to assess future returns on asset classes [0.5].
- Also recency and home bias would be paid.

IE comment: The investor seeks to live off the income so has a hidden assumption that dividend yields are stable (or are increasing in line with inflation) over time. During a period like Covid, companies may be unable to pay dividends (e.g. tourism) or maybe required by regulators to stop dividends (this is not an Australian issue but caused a lot of angst in Hong Kong when the UK's banking regulator instructed HSBC and other UK banks to stop dividends) as the retail investors in HK depended and on (and expected) the dividend income.



- e) **Assess** his proposed strategy against his liability profile (assuming he does retire now).
Incorporate your earlier findings into your answer.

5 marks A LO 6.2 M11.5

Note students had to present the steps to setting a strategy in Q2. No marks paid here for copying the same answer in again. This question only concerned with assessing the given strategy, not implementation, monitoring, or changing to some other strategy.

1 mark max for correct points describing liability profile

This investor is 40 and planning to live off his investment income, for life. Then to bequest the remainder. So his liability profile (or requirements) includes

- A regular drawdown (preferably from the income generated and not the capital)
- Indexation of income (cost of living increases)
- 40 year plus timeframe (lifespan)
- Capital to be protected so that at death to be transferred to beneficiaries.

max 1 mark for clearly stating investment objective is long term real returns and capital protection as this is basis for assessment:

So the investments will need earnings with a real return above inflation [.5], to enable long time frame and indexed drawdowns without using capital [.5].

Max 0.5 for stating his strategy

His proposed strategy is entirely Australian listed equities

1.0 for each distinct point of assessment provided a clear link from strategy to liability profile, require at least one positive and one negative or cautionary assessment point to get full marks. Points below are examples, they are not distinct, and more than expected.

- Equities maximises the real return over the very long term so is suitable. [1.0]
- Growth in the capital values (and dividends) of equities is expected to outstrip inflation due to risk premium, so suitable to protect long term capital value. [1.0]
- Dividends from the equities can be allocated to the income required, and any balance reinvested, addressing income requirements [1.0]



- I assume a very diversified set of equities, to minimise impact of any one company failing to meet long term growth expectations and depleting the capital. [1.0]
- Equities means can use the listed markets, ensuring liquidity for any income drawdowns and easy transfer to beneficiaries in due course.

However,

- Equities market might fall in one year (as was recently the case) so that capital value declines and/or dividends decline, which would not support objectives in the short term [1.0].
- Which can be mitigated by Income can continue in market downturns, and still be indexed, by accessing dividends and perhaps some share sales [1.0]
- But Income payments may require a drawdown on capital when dividends low, reducing income and/or remaining timeframe [1.0].
- Sequencing risk might mean that capital/income reduces when least able to accept that or when limited time to recover. [1.0]
- There is no exposure to other asset types/overseas assets/ or currency, which limits diversification of portfolio so perhaps more risky than it needs to be [1.0]
- Client may have overseas liabilities (eg plans to travel extensively; purchase technology or medical products from US) so some exposure to overseas assets or currency would improve alignment of assets to liabilities [1.0]

0.5 for stating conclusion of assessment consistent with comments

- Assessing this strategy against the objectives, I find it suitable

Total marks 20

END OF QUESTION 3: MARKING GUIDE



QUESTION 4: MARKING GUIDE

(28 marks)

Learning Objectives

3.2	Discuss the components and drivers of the risk and return of the three principal asset classes (Equity)	SA
2.9	Distinguish between the primary and secondary markets	A
6.2	Describe and apply the factors that influence investment strategies	A
6.3	Describe the principles of investment and the asset/liability matching requirements of the main providers of benefits on contingent events	SA
6.5	Express appropriate investment constraints, based on the liability profile of a fund	A

Background

Datasenta is a US unlisted company with a stake currently for sale to a private investor. The seller has provided the following information - carefully read before answering.

- Datasenta's **primary business** is providing data storage capacity at its 15 data centres spread across five campuses in the US.
- Datasenta had annual net revenues of US\$300 million – 10% higher year-on-year – according to its June 2023 full year accounts.
- Future growth will come from two sources: a double-digit annual increase expected in data volumes, especially with the proliferation of artificial intelligence-led businesses; and an increasing number of corporates outsourcing their data storage.
- Datasenta's customer turnover (churn) rate was almost zero and clients may vary their volumes but almost never leave.
- Datasenta is expected to make an internal rate of return in the low double digits, but as yet has not paid a dividend.
- Stable, experienced management team.
- Datasenta is valued (30 June 2023) at US\$10 billion with 10 shareholders.
- One shareholder is selling their 10% stake, asking US\$1 billion.
- The stake will give a non-executive director position on the board



(Note this information is taken from media around Aware Super's purchase of Switch)

Questions

- a) **Apply** System T to assess the risk and return characteristics of this 10% stake in Datasenta (assume for an **Australian investor**). Note any other assumptions you make.

14 marks A LO 3.2 M6.2.5, 6.3.2

Max 3 marks per each element of the SYSTEM T mnemonic. Some may only have one or two points so not expecting 3 marks for every element. Must reference the Datasenta information to get full 3 marks in any element (examples in bold).

- Security: How likely is the investor to receive the expected future cashflows (dividends) and/or lose the capital? [.5] **The business appears viable from the information given, but has not yet paid a dividend.** [.5] Future dividends are unknown, [.5] but future capital growth should follow if the business continues to be successful and grow as indicated [.5]. Investor however still has a risk of complete loss of capital [.5] (say if Datasenta's systems fail or are hacked [.5]). Note that US companies may prefer not to pay dividends as their tax system biases towards capital gains [.5] which may not suit if the investor requires income [.5] (Berkshire Hathaway for example has never paid dividends [.5]). [Max 2]
- Yield (income/return): What is the future income? [0.5] As noted, there is **no dividend or share price history to date** [.5], so future dividend income or return is difficult to determine from this information given [.5]. More generally equity stocks are expected to return well above the risk free rate plus inflation [.5], over the long term. **Net revenue is currently 3% of asking price** [.5], **which may be too low, ie asking price too high** [.5] **for required yield.**
- Spread (bid/sell. Transaction costs); **Being unlisted** [.5] the costs of purchase (and later sale) can be relatively high [.5]. For example, the investor will have to do their own due diligence legal and financial [.5], as no public information, and arrange a contract specifically for the transaction [.5], and possibly finance the investment [.5].
- Term: There is **no fixed maturity date** [.5], so effectively a perpetuity [.5] assuming Datasenta can remain a going concern [.5]. This also means no particular date the investor will be able to exit easily [.5].



- Expenses (or Exchange rate) **Expenses of acquisition** discussed above are high, but there are also **expenses to be a shareholder of an unlisted company** [.5], including ongoing accounting, legal advice, may have to pay the board member, annual valuations of Datasenta may be needed [.5]. And/or **Exchange rate** will be an issue as our investor is **Australian** [.5], so AUD/USD will be critical both initially and in the future [.5]. Adverse exchange rate movements could devalue the investment in AUD [.5]. Hedging the currency exposure is an option [.5]. Costs for understanding and completing the legal, compliance and taxation requirements in an unfamiliar market [.5] will be needed.
- Market (liquidity): As this company is **unlisted**, and moreover only in 1 country [.5] and also a niche service [.5], and only a **10% (ie minority) shareholding** [.5] it may be difficult to find a buyer when the investor wishes to exit [.5], ie very illiquid investment [.5]. If a forced sale, the price offered could be well below value [.5]. The other shareholders or management may be potential buyers [.5] but again price offered may not meet expectations [.5]. .
- Taxation: Datasenta will be paying **corporate tax in USD** [.5], and the investor will have to allow for **international tax regime** [.5] applying between US and Australia. May be withholding taxes (US takes tax) on dividends for example [.5]. Capital gains tax on later sale may be complex [.5]. However expenses including currency hedging contracts, may be tax deductible [.5].

b) Explain how one risk would be mitigated if Datasenta was available as a listed equity on the US markets.

2 marks A LO 2.9 M6.2.5

0.5 per part point. Must identify the risk, how listing makes a difference and reduces that risk to get full 2.

The obvious risk that is mitigated by listing is **liquidity** [0.5], as Datasenta is unlisted it is difficult for an investor to control both the time and the price of a later sale [0.5]. There may be a buyer, but not at the time or price desired [0.5]. Or, at the time a sale is needed, the price is unfavourable or there is no buyer at all [0.5]. Once listed, there is a daily market price and potential buyers [0.5], so the investment can be sold promptly if required. (0.5)



Other risks

At present if the majority of Datasenta owners agree to raise further capital from the owners, all would have to meet the capital call [0.5], which might not be possible or suitable for the investor [0.5]. Once listed, further equity capital is raised by a share offer to the market and the investor is not required to contribute [0.5] (although they may).

Legal and **compliance** risks (0.5) are reduced for the investor as Datasenta would have to comply with listing requirements (0.5) including public financial reporting [0.5] and oversight by the market operator. [0.5]

This stake is not flexible in terms of the amount invested [0.5]. The investor cannot vary their stake up or down easily. Once listed, the 10% (\$1bn) parcel can be broken up [0.5], ie some shares sold but not all, given the investor more **flexibility** in the proportion of the company they wish to hold [0.5].

Information would be more transparent and readily available [.5] due to listing requirements and public reporting [.5], reducing risk of misinformation [0.5] by management or other owners and/or poor management [0.5] leading to unexpected losses of [0.5]

But there could be higher risk for the **board member** (0.5) and investor as now own a listed US company with all the ongoing compliance obligations (0.5).

c) You are an asset consultant with two very large Australian clients, "Client A" and "Client B", their details follow below.

Client A is a superannuation fund balanced investment option

- Catering to members aged 20 to 65;
- \$250 billion diversified pool (1% cash, 9% unlisted infrastructure, 40% unlisted fi, 50% listed equities); and
- Net cash outflow forecast to be negative \$1 billion per year for the next few years.

Client B is a workers' compensation insurer investment reserve account

- Claim liabilities \$10bn, total assets \$15 bn;



- Assets split into liability reserve \$10bn and investment reserves \$5 bn;
- New business is growing at 10% p.a.;
- Average claim size and average claim duration are both increasing;
- Premium rates are highly competitive;
- Profit margins are being squeezed;
- Liability reserve entirely in cash (requirement); and
- Investment reserves currently in diversified fixed interest.

For each client, apply the principles of asset management to

- (i) **summarise** their liability characteristics
- (ii) **determine** if a \$1 billion unlisted investment in Datasenta would be a suitable additional investment for their portfolio; and
- (iii) **suggest** two actions to mitigate risks, should they decide to pursue the investment.

12 marks 6 A and 6 HO LO 6.2, 6.3, 6.5 M11.3, 11.10
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Could be presented as first the fund, then the insurer, or both clients side by side. A table or paragraph answers acceptable. However, the two clients must be addressed separately, answers for B that are literally “ditto” are not paid marks. Client features must be incorporated into suitability assessment to gain full 6 marks per client.

Superannuation Fund	
Liability Characteristics 0.5 per stated characteristic Max 2 marks	<ul style="list-style-type: none">• Very long term (40+) as open ended trust and paying out at age 65)• Net cash flow out• Inflation protection (price inflation)• Tolerate volatility• Domestic \$
Suitability 0.5 for stating if suitable (or not) 1.0 supporting point linked to facts Max 3 marks	<ul style="list-style-type: none">• \$1B investment would be 0.4% assets and 4% of the unlisted infrastructure. So not going to be a major impact on returns, and even complete loss is bearable.• Equity aspect supports the long-term net real return objective• Will not generate income so will not assist with cash outflows.• Is not liquid, but 50% of current portfolio is listed so will



Superannuation Fund	
	<ul style="list-style-type: none"> not be required to sell at short notice Overseas assets are part of the portfolio, no issues there Will require some other asset to be sold to fund the acquisition as already in net cash flow out Overall , suitable subject to expected returns (ie price paid) Or not suitable as would have to sell some other infrastructure asset to fund the acquisition, too much in transaction costs.
Actions to mitigate An action 0.5 linked to relevant risk 0.5 Max 2 marks	<ul style="list-style-type: none"> Complete due diligence to ensure expected returns (after additional costs) and risks are a good fit Ensure unlisted infrastructure subportfolio has at least 10 investments to keep it diversified. Keep unlisted infrastructure at target 9% so sell something else to fund this. Take up seat on board offered to ensure information and access Hedge currency exposure in accordance with existing policy

Worker Compensation Insurer	
Liability Characteristics 0.5 per stated characteristic Max 2 marks	<ul style="list-style-type: none"> Short to medium term (1 - 5 yrs) to pay most claims but some long term claims Inflation protection (wage inflation) Split investment accounts so focus on Reserve Cash to back known liabilities Reserves supply income to support profit and to protect unknown liabilities and adverse experience (eg higher inflation than expected)
Suitability 0.5 for stating if suitable (or not) 1.0 supporting point linked to facts Max 3 marks	<ul style="list-style-type: none"> \$1b would be 7% of total assets or 20% of the investment reserve, which is too much exposure Long term investment, with uncertain dividends not matched to need for short term income Does not match liability term and may not provide any inflation protection in the medium term Currently no equity, property at all, so this asset would be at the extreme other end of the risk spectrum to current assets Insurer is under pressure, and asset not liquid so could not be cashed out if needed, which is quite likely Overall, not suitable
Actions to mitigate An action 0.5 linked to	If going ahead despite this <ul style="list-style-type: none"> completely hedge currency exposure to minimise risk



Worker Compensation Insurer	
relevant risk 0.5 Max 2 marks	<p>of currency losses;</p> <ul style="list-style-type: none">• set up a put option to sell to other shareholders and/or guarantee a minimum price in certain conditions,• Establish an overdraft arrangement with bank so not necessary to sell at short notice to gain liquidity• Take up seat on board offered to ensure access and information

END OF QUESTION 4: MARKING GUIDE

END OF MARKING GUIDE