

ASSET LIABILITY MANAGEMENT

EXAM MARKING GUIDE SEMESTER 2 2022



Marking Guide

This exam represents 80% of the available marks for the Subject Name subject. The remaining 20% comes from the assignment.

Each sub question covers one or more learning objectives from the course and applies a command verb (see over) that indicates the learning level of the question, as shown below. The learning levels are **SA** – Simple Application, **A** – Application, and **H** – Higher order/Judgement/Evaluation.

Question	Syllabus Learning Objective	Total Marks	SA	A	H
1	1.1, 1.2, 1.4, 3.2, 3.3	15	4	9	2
2	2.1, 2.5, 2.3, 3.1, 3.2, 5.1	18	1	12	5
3	2.5, 2.7, 3.1, 3.2, 3.4, 6.1, 6.4,	34	11	17	6
4	2.4, 4.1, 4.3, 3.2,	13	0	8	5
Exam		80	16	46	18
Assignment		20	15	2	3
Total		100	31	48	21
Target		100	30	50	20

For each question, the Marking Guide has the Question; Commentary and a Sample Solution.



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. You may think of this as telling a story to answer the question that is asked. In respect of marking, please award marks for defining terms, describing background and context which is relevant to 'telling a story' to answer the question.

We give guidance to students that copying and pasting is allowed but they need to address the specified scenario 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 given problem context. If the marking guide does not specify otherwise, marks **SHOULD** be awarded for relevant comments that may appear to have been copy 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 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)'.

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.

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 provided in a separate document.



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QUESTION 1: MARKING GUIDE

(15 marks)

Question

You are developing a deterministic valuation model to value residential properties. The resulting property values will be provided to long term investors to assist them with selecting properties for purchase. The residential properties will be let to tenants and generate rental income for the investor and may generate a capital gain over time.

a) To establish your model:

- i. **Describe** your valuation method. (2 marks)
- ii. **List** four inputs or assumptions (parameters) that will be needed for that method. (2 marks)
- iii. **Explain** Redington's concerns re setting discount rates. (2 marks)
- iv. **Suggest** cautionary wording to include with your model valuation results. (2 marks)
- v. **Explain** two steps you will take to ensure your work is at a professional standard (2 marks)

b) Your manager points out that investors may be using the investment rental stream to offset their own accommodation costs (rent or mortgage payments).

- i. **Examine** the investor's risks in this scenario. (3 marks)
- ii. **Explain** how to use a deterministic model to demonstrate the potential financial risks for the investor. (2 marks)

Commentary

Question	Syllabus Learning Objective	Page Reference in Course Notes	Total Marks	SA	A	H
1	1.1, 1.2, 1.4, 3.2, 3.3, 6.6, 6.7		15	4	9	2
A(i)	3.3	7.4.2, 7.4.3	2	2		
A(ii)	3.2	2.2.1, 2.2.2	2	2		
A(iii)	1.4	2.1.1, 2.3.4	2		2	
A(iv)	1.1, 1.2		2			2
A(v)	1.1	2.2.4, 2.6	2		2	
B(i)	3.2	7.2.3	3		3	
B(ii)	1.1	2.2.1	2		2	



Sample Solution

a) To establish your model:

- i. My valuation method will use discounted cash flows [.5], where:

Value = Present value of all forecast cashflows + present value of terminal value
[.5]

And we set the term to final sale of asset [.5]

Cashflows (rent less outgoings less taxes) are forecast until sale date (nominal)
[.5]

Terminal Value = predicted value on sale after expenses and capital gains taxes
[.5]

Discount rate = investor's required minimum rate of return, which is likely a positive real return including allowance for risk premium [.5]

Some students may include Probabilities of cash flows (e.g. occupancy rate) [.5]
here

Alternative answer would be capitalisation rate method [.5], where:

This method assumes a perpetuity

Value = maintainable net income divided by capitalisation rate [.5]

maintainable net income = current rental income adjusted for all landlord outgoings and taxes [.5]

capitalisation rate = industry implied rate for residential property in that area or the investor's required rate, which is likely a positive real return including allowance for risk premium [.5]

[method might also allow for probability of rental cashflows, expected time to hold property etc 0.5 for naming approach, 0.5 for explaining each distinct element max 2 marks]



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ii. Four inputs or assumptions (parameters) that will be needed for **DCF**:

- Rental income expected current year
- Rental inflation
- Landlord outgoings/expenses
- Expense inflation
- Taxation
- Terminal value (or inflation to determine terminal value)
- Discount rate
- Vacancy rate (or occupancy rate)
- Probability rent paid (or default)

Four assumptions (parameters) that will be needed for **Cap Rate**

- Rental income expected current year (so might be gross rent and probability received)
- Landlord outgoings/expenses
- Taxation
- Capitalisation rate

[0.5 per relevant item, max 2 marks]

iii. Redington's concerns re setting discount rates was that discount rates (compound interest rates) are not real, they are hypothetical [1] – there is no alternative investment that will generate that discount rate for that period of time without any risk/variation for the investor. [1] So is it relevant to use a discount rate to value an asset.

[read M2.1.1, looking for any concise summary of this idea two statements, 2 marks]

iv. The results of this model reflect the property rental information provided, your minimum required earning rate and also assumptions made about the future [1]. These assumptions may not (will not) be met in practice/reality [.5]. It is possible that as circumstances change [.5] this property may not achieve the expected returns [.5].



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Also, the industry/market/investor may change their underlying pricing assumptions in the future (especially the required discount rate) which will require a rerun and updated pricing outcomes

This model and its assumptions were established to value properties of a certain type and location [.5]. It may not be relevant to apply this model to other types of properties [.5].

It is unrealistic to expect the future actual returns to be exactly and consistently your required discount rate.[0.5] The model provides a guide only [.5]

[Expecting assumptions being mentioned, future experience not as assumed, 0.5 per point max 2]

- v. To ensure my work is at a professional standard the model needs to be fit for purpose [.5] and results suitable for the audience [.5].

I will have the model calculations peer reviewed by my manager [.5] to ensure it is working correctly [.5] and has explanations of all terms and results [.5].

I will source and document information to support the assumptions [.5] and obtain peer review of assumptions [.5]

I will test the outputs with a third party to get feedback [.5] and confirm that the outputs are clear, not confusing, [.5]

I will test the model by varying the data and assumptions [.5] and reviewing the outputs, to verify that the outputs are changing as expected [.5].

I will review the model design, assumptions and outputs [.5] against the relevant Professional guidance on projection models [.5]

I will run the model for specific properties that recently sold [.5] (or back test) to check it is returning realistic valuations [.5]

[to demonstrate competent; model fit for purpose, results suitable for audience, see M2 page 14 expecting a few ideas and reasons linking to professionalism 0.5 per idea or reasoning max 2 marks]

- b) Your manager points out that investors may be using the rental stream to offset their own accommodation costs (rent or mortgage payments).



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- i. When the investor is using rental income to offset other costs that are relatively fixed, they are dependent on the rental income [.5]. So **their key risks** arising are:
- Rent not being received as expected (recalcitrant tenant) [.5] so timing mismatch [.5]
 - Inability to secure a tenant at all [.5] so unable to offset accommodation costs [.5]
 - Unexpected expenses for rental property, maintenance or emergency repairs, using up the rent [.5] again unable to offset costs [.5]
 - Rental income not increasing at the same rate as own accommodation costs [.5]
 - Mortgage rates go up so repayments (accommodation costs) go up, but investment rental cannot be reviewed until next renewal [.5], so shortfall for a period [.5]

[expecting a few examples, focus on rental risks max 3]

- ii. The investor's outflows for accommodation costs can be incorporated into the cash flow model or allowed for in the Cap Rate model.

A deterministic model can then demonstrate the potential financial risks for the investor by varying the assumptions [.5] and re-running the valuation to see the impact [.5]. Individual assumptions can be varied [.5] (e.g. rental income reduced by 10%) and also adverse scenarios [.5] can be drafted whereby all assumptions are reset on a new consistent basis [.5] of say higher cash rates, and the valuation updated [.5].

As this is a deterministic model, the movement in the valuation result indicates how that scenario would affect the investors position, but not the likelihood of it occurring. [1]

END OF QUESTION 1: MARKING GUIDE



QUESTION 2: MARKING GUIDE

(18 marks)

Question

A superannuation fund communications team is drafting the member newsletter and, as you are the lead asset consultant, they have asked you to draft the responses for these questions:

- a) **Propose** plausible reasoning for inflation increasing rapidly to 5% per annum (or more) around the world in 2022. (3 marks)
- b) **Explain** why some central banks responded by increasing cash rates. (2 marks)
- c) **Examine** the impact of high inflation on each of the three main asset classes (debt, equity and property), for an investor. (6 marks)
- d) **Explain** why speculative bubbles arise and then 'pop'. (3 marks)
- e) **Suggest** the likely impact of increasing cash rates on residential property pricing. (2 marks)
- f) **Explain** the benefits of asset class diversification for superannuation members (i.e. long term investors). (2 marks)

Commentary

Question	Syllabus Learning Objective	Page Reference in Course Notes	Total Marks	SA	A	H
2	2.1, 2.5, 2.3, 3.1, 3.2, 5.1		18	1	12	5
A	2.5		3			3
B	2.1	3.2.3, 4.4.1	2		2	
C	3.1, 3.2	4.4.2, 4.4.3, 4.4.4	6		6	
D	5.1	10.5.1	3	1	2	
E	2.3	4.4.2	2			2
F	-	-	2		2	



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Sample Solution

- a) Reasons for inflation increasing rapidly to 5% per annum (or more) around the world in 2022 include:

Prices rise when more demand than supply [0.5], and a primary reason for recent inflation is supply chain disruption (reduced supply) [0.5] while at the same time economy growing (post covid) faster than expected (increased demand) [0.5].

In addition, there has been

- workforce disruption globally [0.5] due to covid, (e.g. no workforce at all for lockdown periods) reducing ability to supply or transport goods as needed [0.5] and unmet demand driving up prices [0.5]; OR
- workforce disruption due to covid [0.5] making some businesses short staffed, having to pay higher rates to secure staff [0.5] and passing this cost on via higher prices [0.5];
- energy markets moving away from carbon [0.5] disrupting energy markets and destabilising pricing [0.5] with some generators closing, leading to even higher energy prices [0.5] and flow through to higher product and transport costs [0.5]
- war/covid/natural disasters [0.5 any relevant example] leading to shortages of certain products especially food and energy [0.5] driving up prices [0.5]
- government covid support [0.5] led to increased demand/growth in some sectors, e.g. construction or health care, [0.5] and resulting workforce shortages led to wage rises [0.5] and then price rises [0.5] in those sectors
- low cash rates (government policy) [0.5] facilitated higher valuations of assets, including property [0.5] which lifted expectations for rents [0.5] which contributes to inflation [0.5]
- low cash rates (government policy) [0.5] until recently, which encouraged spending rather than saving, supporting demand even when supply limited so some businesses could increase prices.

[any appropriate points, linking real world matters to inflation in a logical way, max 3 marks]



- b) Some central banks responded (to higher inflation) by increasing cash rates because central banks use cash rates as lever [.5] to implement monetary policy [.5] Their objective to stabilise price inflation [.5] is achieved by increasing cash rates to divert investors' money to cash, bonds and other assets and away from spending, which reduces demand [.5]. Similarly increase lending rates [.5] so that businesses have a higher cost of doing business, [.5] slowing down their activities and demand for products [.5]. Ideally higher risk free rates (and resulting discount rates) also reduces the market value of assets like property [.5] which might stop further increases in rent and pop speculative bubbles driving up prices [.5].

[expect a logical flow of points max 2]

- c) The impact of high inflation on each of the three main asset classes, for an investor is described in the table below

Class	Impact of high inflation
Debt	Higher (expected) levels of inflation lead to higher (expected) bond yields [.5] and therefore lower bond prices [.5]. (unless bonds indexed) Investors require compensation for inflation risks [.5], bonds are repriced (downwards) until the future yield is at least at inflation, real yield is maintained. Riskier credit has a further credit risk premium [.5] and in times of high inflation this premium may also increase [.5], further decreasing bond prices [.5]. Overall result is the price of nominal bonds held will fall, but notably the coupon [.5] and principal maintain their contracted value [.5].
Equity	In theory investors would expect business and dividends to grow in line with inflation [.5], and therefore share price as well [.5], so higher inflation may have no net impact [.5] (both future growth rate and valuation discount rate increase so price stable [.5]).



Class	Impact of high inflation
	However if higher inflation is leading to weak economic growth [.5] or comes with other adverse conditions (lack of workforce or inputs, higher financing costs) [.5] then businesses may suffer [.5], profits decline, dividends decline and then price decline [.5]. The investor's experience may depend as much on the success of the individual business in a high inflation environment [.5] as the overall market expectations [.5].
Property	<p>Higher inflation generally mean higher discount rates when valuing properties [.5], so lower valuations [.5].</p> <p>However property owners may be able to index or increase rental rates [.5], offsetting the impact of high inflation [.5]. Some may not be able to achieve this due to inability to index rates during a contract term [.5] or lose tenants altogether [.5] limiting their protection against inflation [.5] reducing property values.</p> <p>Properties that are leveraged [.5] (have a loan financing the investment) may struggle if the lending rates are also rising [.5] alongside inflation, reducing the net value of the investment [.5].</p>

[looking for reasonable statements, covering both income and price of each asset to get full 2 marks per asset, max 6]

- d) The term 'speculative bubble' is when asset values are driven unreasonably high [.5], to a price not supported by a realistic view of the future cashflows [.5] for that asset.

Alternative definition as per Investopedia: A speculative bubble is a spike in asset values within a particular industry, commodity, or asset class to unsubstantiated levels [.5], fuelled by irrational speculative activity that is not supported by the fundamentals [.5].

[1 mark for explaining what the term means]

Speculative bubbles may arise when there is some information that suggests the asset is under-priced [.5], so market activity starts increasing the price. Then, market activity continues [.5] to drive price higher when there is nothing substantive to support the higher price, i.e. irrational [.5].



These further increases may be driven by speculators, short sellers [.5], a 'herd mentality' or fear of missing out [.5], or investors acting on misinformation [.5] or wishful thinking [.5].

Low cash rates, 'cheap' lending or financing rates may compound this behaviour [.5] as investors and businesses can borrow relatively cheaply in order to chase assets with (perceived) higher returns [.5].

At some point investors reset their expectations back to 'normal' [.5] and the price (usually rapidly) falls back to a realistic level [.5].

A change in market sentiment [.5] our outlook [.5] or interest rates [.5] can lead to many investors deciding to 'take the profit' and sell. [.5] This can create a reversal in the asset pricing [.5] and can lead to panic selling (the reverse of the bubble) [.5] and the pricing bubble pops [.5].

[This is "explain" so looking for a series of statements 0.5 each that describe a bubble, present a plausible cause for a bubble, and then cause for the pop. max 3 marks only if cover all 3 elements]

- e) The likely impact of increasing cash rates on residential property pricing is that increased mortgage lending rates follow quickly [.5]. This affects current mortgage holders, but it also means there is less appetite (or ability) to borrow [.5] by new home buyers. This reduces the demand for properties [.5], which reduces prices [.5]. At the same time lenders and property investors apply higher discount rates [.5] for their property valuations which acts to reduce the value of the property [.5].

[Looking for logical set of statements leading to lower prices max 2]

- f) Superannuation funds can invest taking a long term view as members are investing for their working life and beyond [.5]. This means they can take advantage of the benefits of asset class diversification, whereby the fund can spread its investments across a range of asset classes [.5] (like debt, equity and property [.5]). When one asset class is performing well this offsets weaker results in a different asset class [.5], and over the long term the combined assets still deliver a real return [.5] (higher than inflation).

Or



Diversification means lowering risk by spreading money across and within different asset classes [.5], such as shares, debt, property and cash [.5]. It's one of the best ways to weather market ups and downs [.5] and maintain the potential for long term investment growth [.5] which suits superannuation members who are investing for many decades [.5].

[straightforward and may simply copy a definition of diversification. However, expect some reference to superannuation being lifetime investment to gain max 2]

END OF QUESTION 2: MARKING GUIDE



QUESTION 3: MARKING GUIDE

(34 marks)

Question

Your client is a university scholarship fund (USF) that provides 30 scholarship places. Each scholar is receiving \$20,000 per annum in 2022, and this is indexed each future year with the consumer price inflation index (CPI). When one scholar completes their degree or leaves the program, another student is offered a scholarship, so that the USF is paying for 30 scholarships in any one year.

It is intended that the USF is a perpetuity, that is, it will continue to fund 30 scholarship places each year, forever, without any further donations coming in.

The USF has assets valued at \$20 million as at 30 June 2022. The USF has been invested entirely in listed shares and returned -10% over the financial year ending 30 June 2022.

Concerned about the investment loss of around \$2 million over the past financial year, the University has appointed an all-new board of trustees for the USF and the new trustees have requested your assistance to review the fund's investment arrangements.

a) As part of your investment overview briefing for the new trustees:

- i. **Explain** the characteristics of the USF's liabilities. (2 marks)
- ii. **Explain** why a real return is required. (2 marks)
- iii. **Discuss** the reasons for a risk premium for the asset sectors of equity, debt securities and direct property. (6 marks)
- iv. **Propose** an appropriate return objective for USF's assets. (2 marks)
- v. **Propose** a risk objective (constraint) for USF's investment portfolio. (2 marks)

b) The new trustees intend to maintain some exposure to equities.

- i. **Explain** the main macroeconomic influences on the equity market as a whole, with reference to current conditions. (4 marks)
- ii. **Analyse** the benefits, costs and risks of investing in equities relevant to USF via
 - purchasing listed ordinary shares;
 - purchasing listed preference shares; and
 - purchasing shares in an unlisted private company. (12 marks)
- iii. **Describe** two approaches to weighting an equity market index. (2 marks)



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- iv. **Suggest** one index weighting approach for the trustees to use to benchmark their equity portfolio, with reasons. **(2 marks)**

Commentary

Question	Syllabus Learning Objective	Page Reference in Course Notes	Total Marks	SA	A	H
3	1.3, 2.5, 2.7, 3.1, 3.2, 3.4, 6.1, 6.4,		34	11	17	6
A(i)	6.1	11.3	2		2	
A(ii)	2.5	10.4.3	2		2	
A(iii)	3.2, 3.4	10.3.1, 10.3.2, 10.3.3	6	3	3	
A(iv)	6.1, 6.4	11.4	2			2
A(v)	6.1, 6.4	11.4	2			2
B(i)	2.5	4.4.3, 6.4.1	4		4	
B(ii)	3.1	6.2.2, 6.2.3, 6.2.5	12	6	6	
B(iii)	2.7	4.7.1	2	2		
B(iv)	2.7	4.7.2	2			2

Sample Solution

a) As part of your investment overview briefing for the new trustees:

- i. The USF's liabilities consist of the annual payments [.5] to the 30 scholars, current value \$600,000 per annum [0.5], which are paid every year into the future [.5], that is, a perpetuity [.5]. The payments are then indexed [.5] with inflation, however the inflation rate is not known in advance [.5].

The scholarships are (ideally) guaranteed [.5] so have to be paid each year regardless of investment performance or inflation or real return [.5].

[expecting perpetuity explained, uncertain indexation, known initial cashflows max 2]

- ii. The term "real return" refers to the rate of investment return [.5] after allowing for inflation [0.5] (or deducting or net of) and taxation [.5]. **[max 1 mark for a reasonable definition]**



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The USF needs its capital value (or investment portfolio) to grow at least as fast as inflation [.5] to maintain the real value (of its scholarships) over time [.5], hence USF needs a positive real return [.5].

As the payments made each year from the portfolio are 3% of the **current** capital of \$20m [.5], the USF needs to earn enough to cover the payments [.5] AND keep up with inflation [.5], hence a positive real return of 3% as a minimum [.5] [max 1 mark for explaining by using USF]

[expecting definition (what) plus application to USF (why) total max 2 marks]

iii. A risk premium is expected for the asset sectors of equity, debt securities and direct property because:

- Debt: Debt cashflows are known (amount and timing) [.5] however there are risks that are also priced into a valuation, including the term premium (or inflation risk) [.5] that allows for risk that inflation changes over time (increases) and reduces the real yield [.5] and the credit risk (or credit spread or default risk) [.5] that allows for the risk of default by the issuer [.5] on coupon and/or principal.
- Property: (Direct) Property investment cashflows and therefore returns are reasonably predictable [.5] The risk premium captures inflation risk to the extent rental income is not indexed [.5] but more importantly the property specific risks [.5]. These are the uncertainty around the capital value of the property when sold [.5] and the uncertainty about future rental income [.5] (due to vacancies [.5], changing rental rates over time e.g. due to competition for tenants, market position changing [.5]).
- Equity: Equity cashflows are less certain as dividends can vary (or stop) [.5] and the timing of the sale of the equity is at the investors discretion [.5] so the sale price is not known in advance [.5]. The equity risk premium arises due to the uncertainty of dividends [.5] (amount, timing) and uncertainty of the future capital growth [.5] of the company (or future market price) and uncertainty of the time until sale of the asset [.5]. There is also a risk that the company fails [.5] with no capital return at all [.5].

[max 0.5 per class for any comments on the returns/aspects that are NOT risky, but the focus is on risk elements max 1 to 2 marks per asset type max 4]



- iv. As USF is a perpetuity and is drawing out \$600,000 per annum [.5], this amount needs to be earned each year [.5] (3%) plus to ensure the benefits can be indexed [.5] the capital needs to increase in line with inflation [.5] (or more). It may not be possible to earn this each and every year so a longer timeframe is appropriate [.5].

A possible return objective for USF's portfolio is CPI plus 3% per annum [.5] over rolling 5 years [.5].

***[expecting positive real plus timeframe plus reason max 2
Student may also propose a probability of negative return being no more than x% in this answer, although that works equally well to answer next question as a constraining objective. Only pay marks ONCE if they use the SAME objective for both iv and v].***

- v. The University was concerned with a negative 10% return last year indicating that an all equity portfolio with variable returns each year (or large negative returns) is too risky for them. [1] However to achieve a real return of 3% requires a degree of exposure to investment classes that will have negative returns from time to time. [1] Therefore to provide some limits to the risk accepted [.5] I propose a risk objective of a negative annual return occurring no more than 1 year in 5 [.5].

The USF also requires sufficient liquidity to pay the scholarships each year [.5], without crystallising any unrealised capital losses [.5]. Therefore an objective may be to have 10% of the portfolio in cash at all times [.5].

[0.5 for any objective that places a limit to volatility or frequency of loss and .5 if it is consistent with the return objective plus reasoning. Max another 1 marks for reasoning expecting 1 sentence acknowledging that there is a limit to the volatility they can tolerate; and 1 sentence on why there will be negative returns in some years.] [max 2]

- b) The new trustees intend to maintain some exposure to equities.



- i. The main macroeconomic influences on the equity market as a whole at the moment (current conditions) are exceptionally high inflation [.5], slowing economic growth [.5] and increasing cash rates [.5], and more particularly the outlook or expectations [.5] for these factors as share prices are essentially the present value of **expected** future cashflows [.5].

Then a discussion in more depth, with examples shown below

And/or

Investors expect a real return (over inflation) [.5] so increasing inflation expectations should lift their required return and depress market prices [.5] in the short term; an outlook for weak economic growth could increase the perceived risk [.5] and increase the required risk premium again depressing market pricing [.5]; and higher cash rates may also make equities less attractive [.5] until the equities market has priced in higher returns (which means an initial reduction in pricing [.5] until future dividend rates increase).

And/or

Considering the market as a whole, as well as individual stocks, strong economic growth should benefit [.5] business, lead to higher profits, dividends [.5] and market price [.5]; and vice versa, a poor economic growth outlook will lower market prices [.5]

Real interest rates (cash or bond rates, less inflation) are important [.5] that is the difference between cash rates and inflation is key. Low levels of real interest rates should boost corporate profitability [.5] and therefore dividends [.5], as well as reduce the investor's required return [.5], increasing valuations [.5]. And vice versa [.5]

However situations of high inflation and high interest rates are likely to restrict economic growth [.5] (even if real interest rates are low [.5]), the perceived risk leading to lowering market prices as per above [.5].



[There's lots of ways to approach this. A wholesale copy from p25 Module 4 without reference to current conditions cannot obtain full marks. Looking for a well-structured response that covers at least two topics, discusses current situation (e.g. high inflation, low but increasing cash rates, uncertain growth outlook) and clearly ties the factor to the equity market – pricing or valuations. If just talk about dividends without considering market price (or vice versa) then not full marks. Expecting consider market as a whole, not individual companies, and therefore a currency exchange rate discussion not as relevant. If no mention of current conditions max 3 marks otherwise Max 4 marks]

ii. The benefits, costs and risks of investing in equities **relevant to USF** via

	Ordinary	Preference	Unlisted
Benefits	<ul style="list-style-type: none"> Dividends paid when profitable, supporting scholarship payments No limit to upside and exposure to economic growth, supporting long term real return for USF daily pricing and able to transact anytime so liquidity good for USF to manage portfolio and draw down on capital when needed Wide range of companies, sectors available so diversification for USF Transparency and reporting good, consistent with a charitable foundation Some shareholder voting powers 	<ul style="list-style-type: none"> Dividends paid (usually fixed) before any to ordinary shareholders so more certainty and able to meet scholarship payments Priority over ordinary shareholders for return of capital if business winds up so better capital security for USF May have call/put options or convertible rights enabling share in success over time and real return 	<ul style="list-style-type: none"> higher risk but also higher return possible over long term, to support USF achieve real return objective Voting powers Possible seat on board so more control/influence Access ventures and sectors not otherwise available, esp. start ups
Costs	<ul style="list-style-type: none"> Very low transaction costs as using listed markets so very cost effective for the USF equity portfolio (which will be less than \$20m) 	<ul style="list-style-type: none"> Low transaction costs if using listed markets 	<ul style="list-style-type: none"> Considerably higher cost to assess a company, value, , and transact Costs to exit as well



	Ordinary	Preference	Unlisted
		<ul style="list-style-type: none"> But may need advice/broker to source, adding cost for USF without adding sufficient return 	<ul style="list-style-type: none"> Likely not cost effective given a max \$20m portfolio
Risks	<ul style="list-style-type: none"> Will not always deliver dividends sufficient to meet the scholarship payments, requiring sale of some shares from time to time No guarantees on capital values, priced by market so can be volatile, challenging for reporting (if holding) or leads to loss of capital (if selling) Dividends may be withheld for reinvestment, problematic if relying on to pay scholarships Some shares may devalue, or fail, incurring capital losses. This may threaten ability to continue to pay 30 scholarships 	<ul style="list-style-type: none"> Less or no upside to dividends in times of higher profits, so less chance of achieving the real return required over long term Usually low liquidity and less marketable than ordinary, restricting USF ability to trade No voting powers 	<ul style="list-style-type: none"> Expertise needed to select and manage, which USF unlikely to have Less likely to pay regular dividends so does not support need for regular income Business can fail, no guarantee on capital, higher risk of failure than listed, not ideal for charitable portfolio to lose capital Likely to require significant share of the available capital, reducing diversity of portfolio for USF and concentrating risks May not be able to sell at a time of choosing for reasonable value, limiting ability to trade Less transparency and reporting

[Expecting summary lay out like this, and not a cut/paste, in order to separate ideas into one of the three topics. Points should, where relevant, relate to USF portfolio size and their objectives. Pay one mark if point and link to USF, half mark if no link to USF, max 4 marks per type of share, max 12. Note if no reference to USF at all, max marks 9.]

- iii. Two approaches to weighting an equity market index are



Weighting by market capitalisation [.5] (market cap is the number of issued shares times share price [.5]) so every stock on the market is included at its weighting [.5]

Weighting by price [.5], so at each date, all the stock prices are added together and divided by the number of stocks (divisor)[.5]. The divisor has to be adjusted for changes in market composition.[.5]

Weighting equally [.5] each stock, as if \$1 is invested in each and every stock and then total value of that investment tracked over time [.5] – essentially determining the average return across all stocks [.5], regardless of price or market cap. [.5]

[any two of these, 0.5 for naming and 0.5 for each descriptive point max 2]

- iv. **Suggest** one weighting approach for the trustees to use to benchmark their equity portfolio, with reasons.

I suggest that USF adopt a market capitalisation index [.5] for benchmarking as it is industry standard approach [.5], and meets the requirements of being representative, investible, transparent [.5].

It is relatively easy for USF to have an equity portfolio that aligns with the market cap index portfolio [.5], quite complex (expensive) to invest in equal weighting or price weighted portfolio [.5].

As USF are interested in reducing their overall risk to some extent [.5], investing in the larger stocks on the market [.5] (and aligning with market cap) makes most sense. [.5]

[must clearly state one type for 0.5 and then sensible reasoning for it for 0.5 per point. Noted that there are many subset indices – e.g. industry or market cap or geography or ESG rated – not expecting student to be this specific]

END OF QUESTION 3: MARKING GUIDE



QUESTION 4: MARKING GUIDE

(13 marks)

Question

Your employer Cryptox is a fintech start up that manages one crypto currency, CatCoin.

Cryptox is listed on the domestic equity market.

You are paid in CatCoin by your employer (\$10,000 CatCoin each month) and spend CatCoin directly for all your online gaming and entertainment. However you must convert to domestic sovereign currency (\$) for rent and all other expenses, approximately 70% of your total annual expenses. You live and pay taxes domestically.

There are currency hedging options available for CatCoin against the domestic sovereign currency (\$).

Over the last 24 months you have observed:

Date	1 CatCoin buys \$	Cryptox share price \$
1 July 2020	\$1.00	\$2.00
1 January 2021	\$1.05	\$4.00
1 July 2021	\$1.50	\$20.00
1 January 2022	\$2.00	\$15.00
1 July 2022	\$0.90	\$4.00

a) **Discuss** possible three drivers of the currency exchange rate of CatCoin to \$. (3 marks)

b) **Explain**, using an example, why and how you might use currency options to manage your personal currency exposure each month. (4 marks)

Cryptox has offered to pay your 1 January 2023 bonus of \$50,000 (**net** of income tax) as either Cash, Cryptox shares or CatCoin. Any profits you make on later transactions on the shares or currency will be taxed at your personal tax rate. You must advise Cryptox your decision by 1 December 2022.

c) **Suggest** which form of payment you will select. (3 marks)

d) **Explain** three items of additional or updated information you will seek prior to making your final decision. (3 marks)



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Commentary

Question	Syllabus Learning Objective	Page Reference in Course Notes	Total Marks	SA	A	H
4	2.4, 4.1, 4.3, 3.2,		13	0	8	5
a	2.4	4	3		3	
b	4.1, 4.3	8.3.2, 8.3.3, 8.4, 8.5	4		2	2
c	3.2	-	3			3
d		8.6	3		3	

Sample Solution

a) Discuss possible three drivers of the currency exchange rate of CatCoin to \$

This is essentially the 'price' of CatCoin [.5] so the **basic principles of valuation** are relevant [.5]. What is the supply of CatCoin, what is the demand for it, and what do investors think is going to happen in the future [1 for sentence like this]. So three possible drivers are:

- Who is supplying CatCoin [.5], how much is being created [.5] or is there now a fixed amount [.5]
- Who requires CatCoin [.5], how actively is it being used in online transactions or as an investment [.5], how competitive is the market for cryptocurrencies [.5]
- Are there alternatives [.5] that are 'better' or better priced or opportunities for arbitrage by moving between currencies [.5]
- Market views positive or negative [.5] on cryptocurrency in general [.5] as transactional and/or investment, store of value
- Market views positive/negative on CatCoin, Cryptox management [.5] of it
- Current and future regulations [.5] on cryptocurrencies, exchange rates etc. New or increased regulation may lead to collapse of cryptocurrencies generally [.5] and/or make Cryptox less viable as a business, and CatCoin less viable or attractive [.5].

[expecting basics of supply, demand, expectations about future pay points that combine without duplication. No marks for any points comparing one sovereign economy to another, as CatCoin not a sovereign currency. Max 3]

b) Explain, using an example, why and how you might use currency options to manage your personal currency exposure each month



Why

As I am being paid in CatCoin but mostly transacting in dollars [.5], I am exposed to the exchange rate on a regular basis [.5]. However my expenses are relatively fixed in dollars [.5] Past experience shows it is quite volatile exchange rate [.5] so may not always be favourable to exchange CatCoin for dollars. [.5] This might make it hard for me to ensure I can pay my bills [.5] or to maintain my standard of living [.5] or predict my income in \$ [.5] [max 2 for why]

So I will purchase put options [.5] that give me the right to sell CatCoin for a minimum exchange rate say \$1.50. [.5] I would set these up on rolling monthly basis so I can convert my salary each month [.5] knowing the exchange rate. If the exchange rate is more favourable, e.g. CatCoin buys \$2,00 [.5] then I will lapse the option [.5]. [1 mark for how and 1 mark for corresponding example]

[expecting explanation of the problem; some version of using options to hedge downside risk; example that is relevant to information provided; and ideally explain two possible outcomes. Note Max 3 marks if no example, max 4 marks if relevant example]

c) Suggest which form of payment you will select

“Suggest” means state the form selected and give reasons for the one selected and why not the others.

Conservative answer:

As most of my expenses are in dollars [.5], the safest option is to take payment in dollars [.5]. This gives me the security of being able to pay bills [.5], but also flexibility to immediately (or later) buy Cryptox or CatCoin [.5] if I think it is at a good price and outlook is favourable. If I took payment in CatCoin I might blow it all on gaming (not good)[.5] or the currency exchange rates may move and I lose value when later converting to dollars [.5], i.e. proves not a good investment in dollar terms. Also crypto currencies can collapse or be locked out [.5] which is too risky for me for large investments [.5]. Looking at recent exchange/price movements [.5] and downward trends this year [.5] I could quickly be out of pocket if I take the coins or shares [.5].



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Risk taker answer:

As it is a bonus, I can invest for the long term [.5] and I believe Cryptox has huge potential as a business [.5]. I am contributing to that [.5] whilst working there and have good insight [.5] I would take the shares and invest for the long term expecting capital gains at a future date [.5]. If I took the cash I would only reinvest straight away [.5] so this saves me the transaction costs [.5]. However CatCoin currency is very variable [.5] and subject to a range of pricing factors [.5] out of my control [.5] so not interested in that as an investment.

Virtual World answer:

I don't need that money for my day to day expenses [.5]. I would take the CatCoin and use that to fund my future online expenses [.5] and possibly invest in online real estate, NFTs and other virtual investments [.5]. There is huge potential for investment gains there [.5]. The online world is increasing and this would mean I have a sizable stake early [.5]. There's no investment upside with cash [.5], I would reinvest anyway so saves on transaction costs [.5] to take directly in CatCoin.

[expecting some discussion of expected risk and return, planned use of the money, higher risk and return outlook for CatCoin or shares, or reduce all risk (cash) 1 mark per sensible comment on why their choice, per sensible comment on why not the others expecting comments to be personalised to their circumstances and perhaps reference the recent history given for the assets. not generic max 3]

- d) Explain three items of additional or updated information you will seek prior to making your final decision

I would want information on

- Currency exchange rate history and current rates for CatCoin:\$ right up to December [.5] so I can decide if CatCoin is under/overpriced and assess risks of later exchange rate moves being unfavourable [.5]
- Option pricing on currency exchange rate looking ahead to January [.5] to understand market expectations of changes [.5] or whether it might be cost effective to take the CatCoin and hedge exchange rate back to \$ [.5]
- Any market information on cryptocurrency markets in general [.5] to better understand risks of holding cryptocurrencies at present [.5]



- Stock price of Cryptox history and current price at end November [.5] to understand if under/overpriced and assess upside/downside risks if take shares [.5]
- Any market information on Cryptox outlook, financials, annual report etc [.5] to understand if under/overpriced and assess upside/downside risks if take shares [.5]
- I would want to understand my tax implications for each option [.5], including if I make a capital gain or loss [.5]
- Updated information on where I can use/spend my CatCoin [.5] to determine if I can spend without currency exchange factors [.5]
- Market transaction history on both assets [.5] so I can understand market demand/supply at current time [.5]

[0.5 mark for naming item and 0.5 for why or what information it adds max 3]

END OF QUESTION 4: MARKING GUIDE

END OF MARKING GUIDE