



# **ACTUARY PROGRAM**

# **ASSIGNMENT COVER SHEET**

**THIS FORM MUST BE AT THE FRONT OF EACH ASSIGNMENT**  
**CANDIDATES MUST KEEP A COPY OF THEIR ASSIGNMENT**

**Candidate to complete the following section (and update details in header and footer):**

<b>CANDIDATE NUMBER:</b>  <b>221XXX</b>	<b>COURSE:</b>  <b>Asset Liability Management</b>
<b>DATE DUE:</b> Monday 28 February 2022 at 9.00pm (Sydney Time)	

- Please ensure that your candidate number and course name is located on the header and footers of each page of the assignment.
- Save as a word document, that is, file type .docx
- By submitting your assignment, you are implicitly stating that the work is your own.
- Remember that an important aspect of being a professional actuary is to always act with integrity. Committing plagiarism by copying another person's work or not properly referencing other sources used in your assignment is a breach of the Integrity principle under the Actuaries Institute's Code of Conduct.



### Part B Assignment

(Total 10 Marks)

1. A trustee is managing a \$2m trust fund for a 5-year-old beneficiary. The entire proceeds will be released to the beneficiary when she turns 30. The trustee is placing 50% of the portfolio into government bonds and 50% into equities via a reputable investment manager. The trustee's initial thought is to invest only in domestic listed equities.

Examine the arguments for and against the inclusion of overseas listed equities for this trust fund. **(4 marks)**

#### Answer is

Arguments for:

- Including overseas equities in the portfolio will provide access to investment opportunities and markets where the risk and return characteristics are different and that may not exist in the domestic market of the beneficiary. This may increase the expected returns of the portfolio.
- Overseas equities in emerging markets may provide investors exposure to markets with higher growth prospects, particularly as the fund will be managed for 25 years, which is a longer horizon, which would provide the portfolio with higher expected returns.
- Including overseas listed equities would also reduce the risk of the portfolio as it increases the diversification of the portfolio as overseas listed equities may not be as correlated to the other assets in the portfolio.

Arguments against:

- Investing in overseas equities may give exposure to currency risk which may offset any positive returns if not properly managed. The exchange rate in the future is also highly unknown, and when the proceeds are released in 25 years the amount may be impacted by the exchange rate at that time.
- Regulations of the countries may change over time. Considering the long horizon of the fund, future decisions made by the foreign country's government may impact on the existing investments or the future ability to invest.
- The availability and quality of information on overseas companies may influence on the ability to appropriately choose overseas equities to be included in the fund. This may have a significant impact on the returns if the companies behave in a risky manner.

2. The trustee learns that long term (10 year plus) government indexed bonds are currently yielding less than 2% per annum (real). Inflation is currently 1.5% per annum. An alternative for the \$1m available is to purchase a residential property and rent it out. The trustee is advised properties are priced on a capitalisation rate of 5% per annum and cautioned that annual outgoings will be \$12,000 per annum.



## Asset Liability Management

### Semester 1 2022 Sample Assignment

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- a) Determine the minimum gross rent per week to charge the tenant to justify the purchase at \$1 million with a capitalisation rate of 5% per annum. **(1 mark)**

**Answer is**

Let annual gross rent be R and assume there are 52 weeks in a year.

$$R / 0.05 = 1,000,000$$

$$R = 500,000$$

Allowing for inclusion of the annual outgoings, we add 12,000/52

Hence minimum weekly rent =  $961.53846 + 230.769 \approx \$1192.31$

- b) The advised \$12,000 annual outgoings include rates, insurance and managing agent fees.

Identify six assumptions required for a Discounted Cash Flow valuation in addition to these items. [Note only the first six assumptions you provide will be marked]

**(3 mark)**

**Answer is**

Assumptions in addition to the above items are:

- Discount rate
- Taxation and duties
- Refurbishment assumptions
- Rental income growth
- Number of years until lease expiry of occupants, including occupancy rates
- Current and future capitalization rate and terminal value

- c) Contrast the risk characteristics of a portfolio of long term government indexed bonds to those of a single residential property. **(2 marks)**

**Answer is**

Credit/default risk:

- For a portfolio long term government indexed bond, the credit/default risk will be low or zero as the governments are typically considered risk free. Although there have been examples in history where this is not the case, this is an assumption frequently made.
- For a single residential property, the default risk is dependent on the creditworthiness of the tenant and their ability to meet rental payments. This would depend on their credit history and varies between individuals/households, however it would be a higher risk than a the credit risk of a government.

Liquidity risk

- For a portfolio long term government indexed bond, liquidity risk will be quite low. This is because government bonds have high marketability. The large issue sizes, the low risk of the bond and its frequently traded with many willing buyers and sellers contributes to the high liquidity of the bond.



# Asset Liability Management

## Semester 1 2022 Sample Assignment

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- For a single residential property, the liquidity risk is quite high. This is because residential property is very illiquid with infrequent transactions. Transactions of property also take quite some time (time to find buyers, agree on a price, paperwork and other settlement requirements) and transaction costs are high.

### Concentration risk

- For a portfolio of long term government bonds, there is diversification in the portfolio if there is a mix of maturities (e.g. 5 year, 10 year, 20 year etc). This may secure the portfolio against concentration risk when the yield curve changes for some terms/maturities.
- For a single residential property investment, if there are no other assets, the investment will not have any risk reduction. The risks to the single property will not be offset by any other asset.

**END OF PART B ASSIGNMENT**