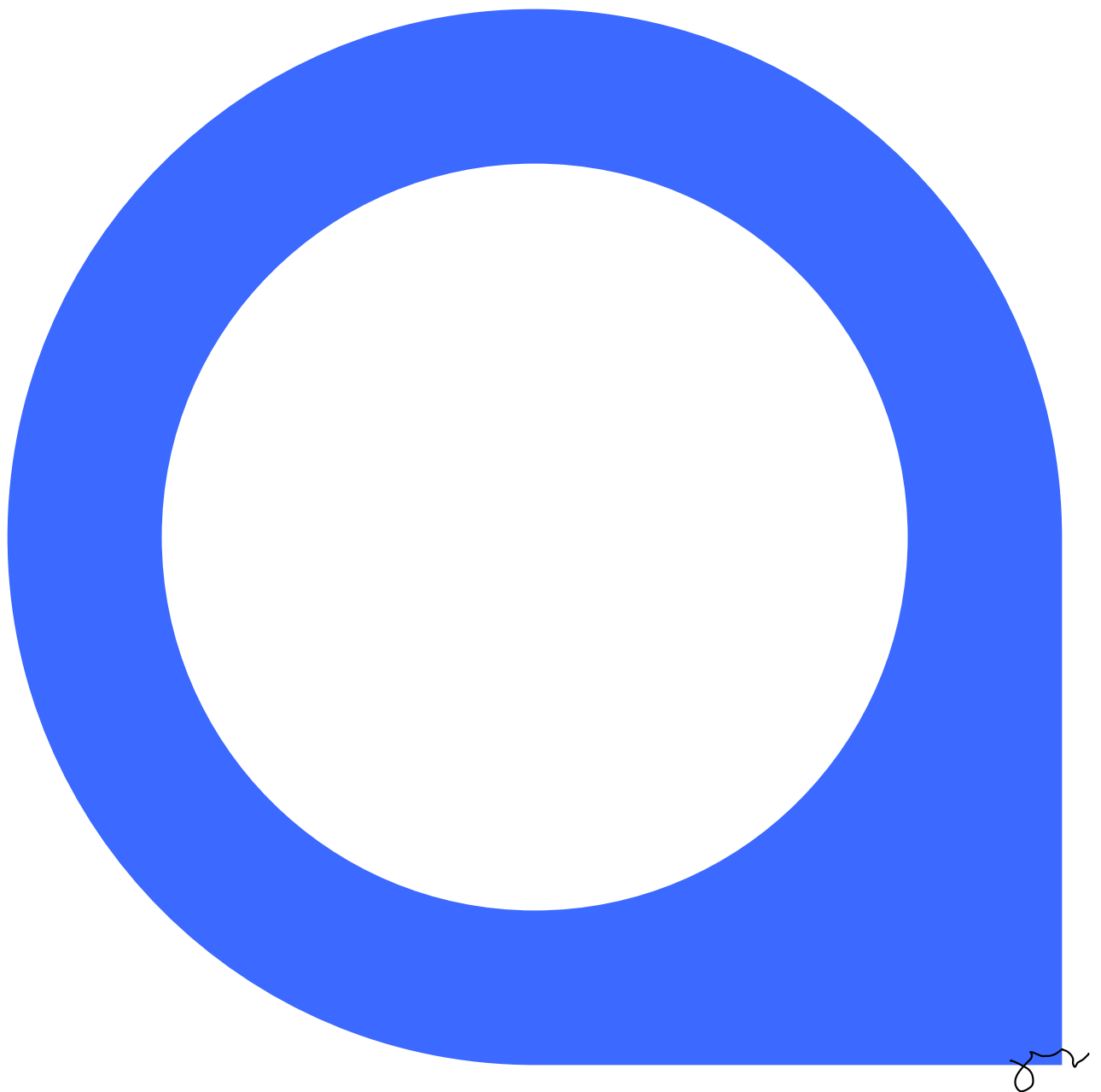


Asset Liability Management

Assignment Semester 1 2025





Preamble

The main purpose of the assignment from your perspective is to help you to develop your skills in matching assets to liabilities. In particular to:

- determine likely long-term investment returns;
- apply a framework for selecting assets to match liabilities;
- set return objectives to support liabilities but within constraints; and
- build and use a simple asset liability model.

These skills will also help you pass the end of semester assessment and perform well in the workplace.

The specific skills that are being developed and assessed in the assignment are the ability to:

- apply subject material in an unfamiliar context;
- plan;
- build and manipulate a spreadsheet model;
- determine appropriate assumptions;
- analyse results;
- communicate relevant points in language appropriate to the audience, in a logical and coherent manner; and
- meet business standards for presentation of written materials.

This assignment provides an opportunity for you to think deeply, spend time preparing a detailed answer and self-reflect on your **writing** skills. Whilst there is ample time to write your assignment answers, you should ask yourself if you need to spend more time improving your writing skills to help you pass time-limited examinations.

The assignment requires you to create a set of sensible **assumptions** or parameters. You need to demonstrate *how* you derived your assumptions or model parameters. It is important that you describe what you did as the marker(s) will want to understand if you are able to apply knowledge to the specific situation described in this assignment. We are also looking for you to demonstrate that you can deal with uncertainty in a reasonable way.

The assignment requires you to build and/or use a **model**. A key actuarial skill is to obtain a grasp of the qualitative nature of outputs from models and describe them. This assignment is designed to test your ability to explain your model methodology and its outputs to a non-technical audience.





There may not be a single correct answer to the question(s) posed. Ensure you have adequately demonstrated your steps, assumptions, reasoning and checks to the marker(s) so that your answer can be considered in context.

Marking Guide

A percentage mark of at least 60% is required to achieve at least a pass grade for this assignment, which is consistent across all the subjects' assignments. This is only an indicative pass mark and the final pass mark for the subject overall may be different.

This assignment represents 20% of the available marks for the ALM subject¹. Your assignment mark will be combined with your exam mark to determine your overall result for the subject.

If you choose not to submit an assignment, or if you do not submit a reasonable attempt, then you are still entitled to sit the examination, but it is unlikely that you will reach pass standard for the subject.

It is anticipated that you will spend at least 20 hours to complete the assignment. In past semesters, some students have spent significantly more time than this, particularly those students who aim for a grade of Above Pass Level or Significantly Above Pass Level.

A detailed rubric is provided with the assignment question and will be used by the markers to assess your performance. The rubric has been posted on the Assignments page of Canvas to guide you as to what is required to achieve full marks for each part of the assignment. You should check that the components of your answer cover the items in the rubric.

You should use a clear structure in your written report, to make it easy for markers to find where you have responded to each of the rubric criteria.

Submission

Deadline

The deadline for submission is 12:00 pm (midday) Sydney time (AEDT) on 10th March 2025.

¹ For students completing the subject as a microcredential Certificate path, the assignment represents 100% of the available marks for the microcredential.



Submit your assignment via the Assignments page in Canvas. If you experience technological issues when submitting your assignment, please send a copy of your assignment by email to education@actuaries.asn.au.

Penalties apply for late submissions (see section on 'Penalties'). You should anticipate potential delays by preparing and submitting your work in advance of the deadline.

Should circumstances arise that mean you cannot submit your assignment on time, you should contact education@actuaries.asn.au in advance of the deadline and apply for special consideration.

File format

The submitted answer is to be a single WORD document. **Your model (whether excel or other file type) is NOT required to be submitted and will not be looked at. Files in other formats will NOT be marked.** However, Graphs and Tables can be copied from EXCEL to the WORD document. The naming convention for files is:

SUBJECT 2025 S1 Assignment member ID (file extension as appropriate).

Please note that if you resubmit an assessment, Canvas automatically adds a suffix to the file name (such as '-1' for the first resubmission). You do not have to make any adjustment for this.

Coversheet

A coversheet for the assignment is provided on the Assignments page in Canvas. Complete and attach this coversheet as the front page of your assignment.

Complete the questions on the coversheet and ensure you are complying with the statements.

Word limit

The assignment has a specific **word** limit of 3000 words, including all words used in tables. Markers will not read or mark any part of your answer that exceeds this limit. Keep your **word** count within that limit. The **word** count does not include:

- cover page;
- contents table or index; and
- references to sources used.





Keep in mind one of the key principles taught in the Communication, Modelling and Professionalism subject: always write as clearly and succinctly as possible, while still including enough information that will be useful for your audience. With that in mind, consider whether each word, sentence or paragraph you include in your assignment adds to or detracts from the message you are trying to convey. Importantly, know that 'more' is usually not 'best'.

Plagiarism

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.

Any suspected plagiarism will be referred to the Institute's Executive General Manager, Education for review. Depending on findings, a penalty may be applied, and/or a complaint regarding the member may be made to the Institute's Conduct Committee. Subject marks may not be released until the matter is resolved.

Penalties

Late submissions

Penalties will be applied to late submissions without prior approval.

If you submit an assessment after the due date and time (whether that is the original due date or any extended due date you have been granted), the following penalties apply:

- within 24 hours of due date and time: 20% x maximum mark available (i.e. deduct 4 marks if a 20 mark assignment, deduct 10 marks if a 50 mark assignment);
- more than 24 hours (1 day) late: 100% x maximum mark available (i.e. assessment score = 0).



Incorrectly formatted submissions

There is no direct penalty if an assessment is submitted in a format with an incorrect file name or an incorrect format (e.g. NOT submitted as a WORD document). However, you may be required to resubmit your work with the correct file format, particularly relevant to modelling or coding assignments.

If a submission does not include the correct identifier (member ID) in the file name, then it may take time to identify you as the student and you may be asked to resubmit your work with an appropriate identifier.

If either situation arises then this will probably cause you to submit late and hence incur the late submission penalties outlined above. Students should therefore follow all assessment instructions provided.

Feedback

Our approach to feedback is for students to receive their grade, general feedback and a sample assessment marked as 'Significantly above pass level'.

You should review the general feedback that is provided to all students as well as the sample assessment. After reviewing the general feedback, you should use the rubric to grade the sample assessment and your submission. This will help you to compare the assessments and identify areas where your submission could have been improved.

Our belief is that this active approach to studying will provide you with a deeper understanding of where you need to improve. This is the best way for you to learn about your areas of strength and weakness. We do not provide students with individual feedback on their assessments.

At the end of the semester, you will receive:

- a letter to indicate whether you have passed or failed the subject;
- if you have failed the subject, a breakdown of your grade for each assessment;
- general feedback to all students about assessment performance; and
- sample assessment(s) that were graded as 'Significantly above pass level'.



Assignment Context

Assignment Aged Care [AAG] is a non-profit company which provides Aged Care to its customers.

“Aged Care” is defined as **personal and nursing care services**, not residential accommodation, meals or other AAG expenses. AAG has provided data on the expected Aged Care expenses in the attached data file (Other Data).

The AAG Aged Care product has these characteristics:

- customers make a single payment of \$ 100,000 at entry;
- customers can only enter during the 12 months following their 60th birthday;
- in return AAG guarantees to provide all the Aged Care that each customer requires for the rest of their life;
- as the customer ages, and therefore requires more extensive care, AAG guarantees to provide whatever level of care the customer requires; and
- there is no refund to the customer of any amount on their death.

The entry payments are invested in an asset portfolio. All cash flows needed to fund Aged Care expenses are drawn from the asset portfolio. AAG pays no tax on investment income or capital gains earned by the asset portfolio, nor on customers' single payment. It does not pay GST.

AAG currently holds \$60 million in the asset portfolio.

You are retained to ensure that the asset portfolio will provide the cash flows to meet the liabilities of meeting the Aged Care expenses over the next 30 years.

Available data

Use ONLY the provided data sets to inform your work on investment outcomes, AAG aged care expenses and customer mortality in the following files:

INV DATA spreadsheet

20 years of historical investment data:

- Equities [Monthly]
 - Accumulation Index;
 - Dividend Yield;





- P/E Ratio;
- Bank Bill Yields [Monthly]
 - 30 days;
 - 90 days;
- Government Bond Yields [Monthly]
 - 10 years;
- Consumer Price Index [Quarterly]; and
- Average Weekly Earnings [\$ per week] All Employees [Quarterly].

OTHER DATA spreadsheet

AAG customer and expense data:

- Age profile of current customers;
- Projected numbers of new customers;
- Current average care expense p.a. per customer;
- Aged Care expense inflation;
- Rate of increase in amount of care due to increasing need with increasing age (in addition to inflation); and
- Mortality rate for aged care customers; Separated by Age & Gender.



Assignment Questions (Total 20 Marks)

Prepare a business report to AAG that covers the following:

- a. Explain the Aged Care liabilities of AAG; **(15% of assignment or 3 marks/20)**
- b. Summarise your observations on the data provided in the two data files (INV DATA and OTHER DATA) and the relevance of these observations to the task of projecting the asset and liability cashflows for AAG (you may use text, graphs, and tables as appropriate, but do not include any Excel workbook that you use to produce your results); **(15% of assignment or 3 marks/20)**
- c. Explain the methodology that you would use to determine an asset allocation for the asset portfolio that provides for the liabilities; **(15% of assignment or 3 marks/20)**
- d. Justify each assumption required to project both the liabilities and the assets over the next 30 years, drawing on the observations that you derived from the data; **(20% of assignment or 4 marks/20)**
- e. Recommend a specific asset allocation across the four asset classes (30 day bank bills, 90 day bank bills, 10 year government bonds and Australian equities) for the asset portfolio including the reasons for that asset allocation.
Hint: Use a simple deterministic Excel model projecting asset and liability cashflows and the net position at the end of each year for 30 years. Do not build a stochastic model and do not spend too much time on building and running the model as we are assessing your judgment skills in this question part rather than your skills in Excel modelling. **(20% of assignment or 4 marks/20)**

Clarity of writing will count for 15% of the assignment or 3 marks/20.

While the assignment contributes 20 marks to the total marks for the ALM subject, it will be marked out of 100 as shown in the rubric.

Ensure your written report incorporates all the relevant information from your analysis and modelling, as the marker will ONLY be looking at your written report.

END OF ASSIGNMENT