



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):

Member ID:	
Subject:	<input checked="" type="checkbox"/> Asset Liability Management <input type="checkbox"/> Communication, Modelling and Professionalism <input type="checkbox"/> Banking <input type="checkbox"/> Enterprise Risk Management <input type="checkbox"/> General Insurance and Health Pricing and Portfolio Analytics <input type="checkbox"/> General Insurance and Health Valuation <input type="checkbox"/> Investment <input type="checkbox"/> Life Insurance and Retirement Product Development <input type="checkbox"/> Life Insurance and Retirement Valuation <input type="checkbox"/> Data Science Applications <input type="checkbox"/> General Insurance Applications <input type="checkbox"/> Life Insurance Applications <input type="checkbox"/> Superannuation and Retirement Applications
Due Date:	Monday, 10 March 2025 at 12:00pm AEST

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 complaint regarding the member may be made to the Institute's Conduct Committee. Subject marks may not be released until the matter is resolved.

Be aware that your assignment may be vetted using Turnitin.



Introduction

AAG is a non-profit Australian organisation that delivers essential aged care services to its clients. It provides a comprehensive range of personal and nursing care services and guarantees these services for the entirety of each customer's life.

The report provides the Board with an evaluation of AAG's long-term financial position, assessing whether AAG's current asset portfolio is sufficiently prepared to meet its future liabilities utilising the Asset-Liability Management (ALM) framework to support its findings and recommendations.

The report is as follows:

- **Section 1** presents a breakdown of AAG's liabilities.
- **Section 2** discusses observations in the data files and their relevance to cashflows.
- **Sections 3 & 4** outline the methodology, assumptions, and justifications used for projection.
- **Section 5** recommends an asset allocation strategy and presents projected cash flows with a sensitivity analysis.
- **Section 6** discusses the report's limitations and gives final remarks.

Section 1 - Aged Care Liabilities of AAG

AAG's primary liability stems from its commitment to providing age care services for the entirety of a client's life. AAG is obligated to continue care indefinitely, and since customers only exit upon death or voluntarily, the timing and nature of long-term liabilities can be unpredictable. Furthermore, as customers age, their care requirements become more intensive, leading to rising aged care costs. Age-care inflation primarily drives expenses, which reflects customer demand, wage growth, healthcare costs, and operational expenses. Ensuring long-term financial sustainability requires AAG to account for its liabilities, which are categorised as follows:

- **Customer care costs:** Covering routine services and variable ad-hoc expenses (e.g., emergency treatments, hospitalisations, specialised equipment).
- **Business operations costs:** Covering staff wages, facility maintenance, utilities, and overheads. These are relatively predictable but can increase over time due to external factors (e.g., inflation, regulatory changes).

AAG's asset portfolio should meet the following requirements:

- **Long-term growth and sustainability:** Since liabilities are throughout the clients' lives, the portfolio should prioritise stable returns and sustainable long-term growth to cover rising liabilities over time comfortably.
- **Liquidity:** AAG must cover short-term costs to sustain daily operations. The portfolio should maintain sufficient liquid assets to fund immediate liabilities, facilitate portfolio rebalancing, and support reinvestment of returns for long-term growth.
- **Matching cashflows:** As liabilities are recurring and long-term, asset classes with predictable income streams should be prioritised to align investment inflows with projected outflows.
- **Risk diversification:** Given the uncertainty in liabilities, AAG should include low-risk assets to mitigate against downturns and ensure long-term stability.

AAG can effectively meet its obligations, ensure continued operations, and maintain long-term sustainable financial growth by structuring its asset portfolio in alignment with liabilities.

Section 2 - Datasets

The projection cashflows relied on two primary data files:

1. **INV Data (2004 - 2024):** historical data on the assets in AAG's portfolio, such as monthly yields and earnings ratios. It also has the quarterly consumer price index and average weekly earnings.
2. **OTHER DATA:** information on AAG's customer base and expenses, such as current expense costs, age care cost inflation, new customer projections, mortality rates, customer profile, and cost increase due to the average ageing of the population.

The datasets were analysed to develop observations to help project asset and liability cashflows.

Historical Cost and Customer Trends

Figure 1 shows a steady increase in the use of aged care, with aged care inflation following a similar trend. A 91.32% correlation between the measures suggests that population ageing significantly drives aged care cost growth, independent of broader economic inflation. This is likely due to older individuals requiring more specialised care, leading to increased costs.

Aged Care Inflation also consistently exceeds CPI changes by approximately 1%, reinforcing that aged care costs are subject to pressures beyond general inflation. These may arise from the labour-intensive nature of aged care, where worker wages constitute a significant portion of operational expenses. As wage growth generally follows CPI trends and is already considered within aged care inflation, for liability projections, aged care inflation is the primary concern rather than wage

Figure 1: AAG Historical Cost Trends (2017 - 2024)



fluctuations.

Mortality rates increase with age (**Figure 2**), with male mortality rates consistently higher than female rates. The current customer age distribution (**Figure 3**) peaks in the mid-60s to early 70s, followed by a decline as mortality rates rise. Since new entrants must join aged care within 12 months of their

60th birthday, AAG's overall customer base may become younger as older customers exit due to higher mortality, but this effect depends on sustained new customer growth, which AAG projects a steady increase in (**Table 1**). However, AAG should consider operational capacity constraints, which could restrict customer intake and revenue growth regardless of external demand.

Figure 2: Mortality Rates (Female vs Male, Ages 60 - 88)

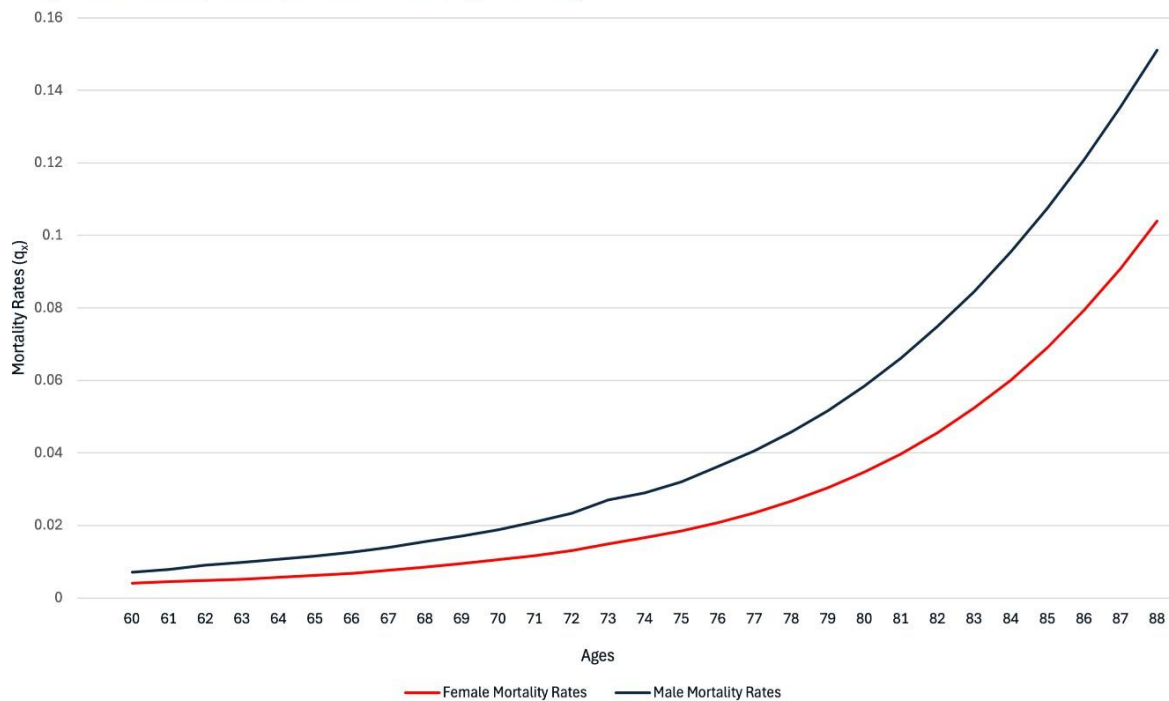


Figure 3: AAG Existing Customer Age Profile

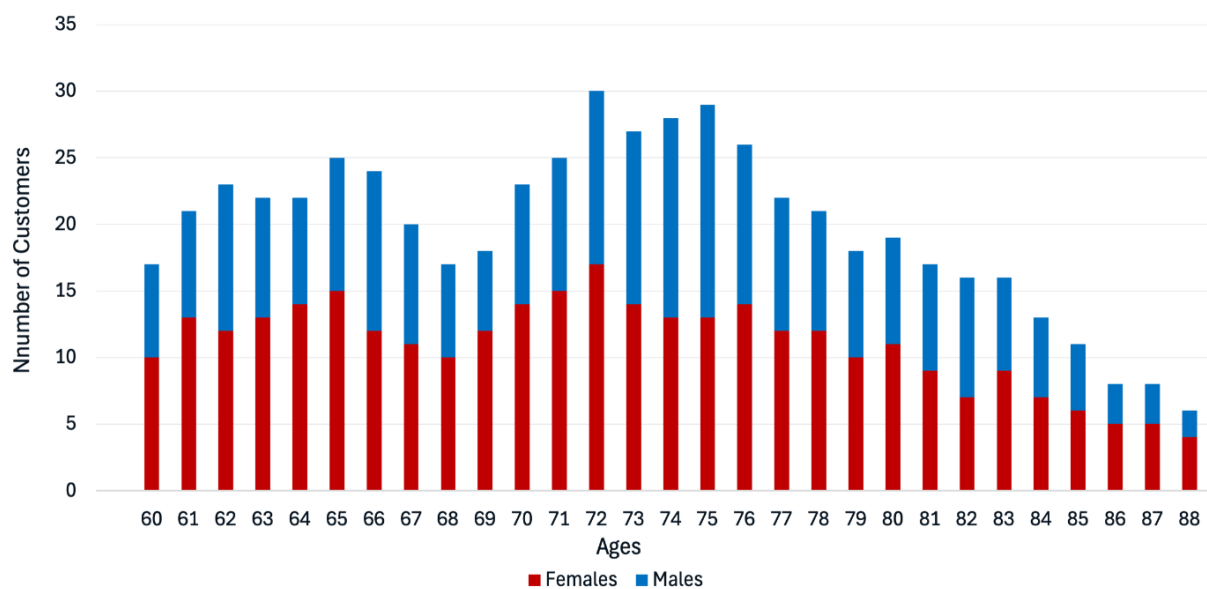


Table 1: AAG New Customers Projection

Year	2025	2026	2027	2028	2029	2030
Number of New Customers	100	110	120	130	135	140

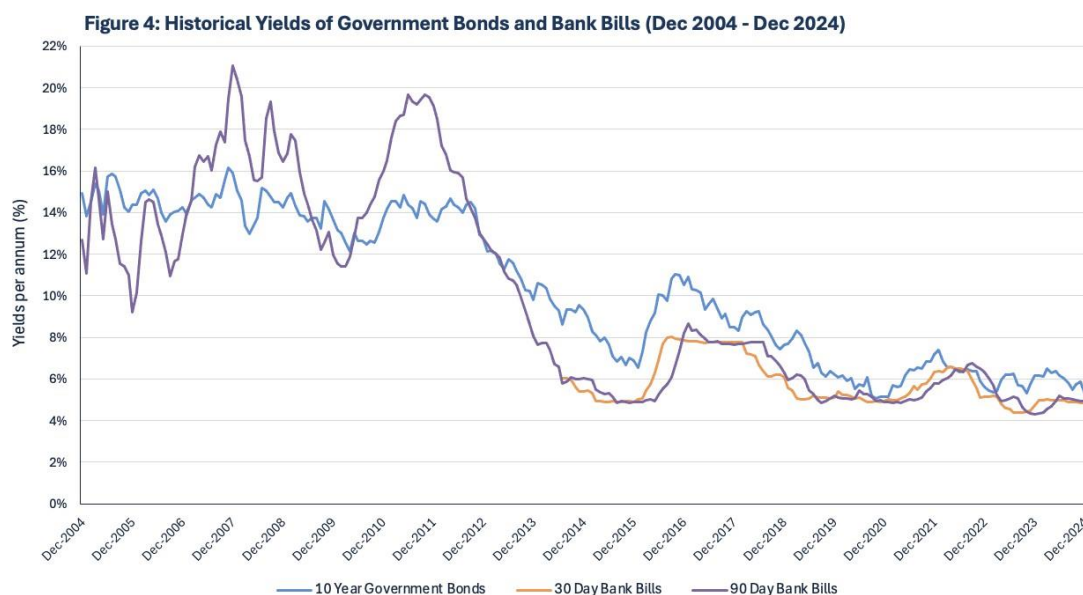
Asset Portfolio Historical Performance

Looking at **Table 2**, short-term investment horizons (< 5 years) have government bonds and bank bills that provide moderate returns with low volatility, whereas equities are highly volatile with negative or low returns. For long-term investment horizons (10-20 years), bonds become more stable while outperforming bank bills, and equities deliver higher but more volatile returns. At 10 years, bond returns exceed bank bills despite similar volatility, and at 20 years, bank bills offer lower returns than bonds despite becoming riskier, highlighting bonds' relative stability and the reinvestment risk bank

Period	10-year Government Bonds		90 Day Bank Bills		30 Day Bank Bills		Price Index		Accumulation Index		Dividends	
	Average	Volatility	Average	Volatility	Average	Volatility	Average	Volatility	Average	Volatility	Average	Volatility
1 year	5.84%	0.33%	4.71%	0.30%	4.64%	0.27%	(12.13%)	8.83%	-8.77%	8.71%	3.60%	0.31%
3 years	5.93%	0.47%	5.28%	0.73%	5.26%	0.70%	(1.56%)	11.39%	1.94%	11.36%	3.43%	0.24%
5 years	5.86%	0.49%	5.17%	0.60%	5.14%	0.57%	2.82%	11.67%	6.54%	11.70%	3.46%	0.25%
10 years	7.00%	1.48%	5.69%	1.07%	5.65%	1.03%	6.85%	12.94%	10.91%	12.93%	3.59%	0.32%
15 years	8.59%	2.73%	7.92%	3.99%	-	-	4.81%	13.62%	8.87%	13.59%	4.06%	0.88%
20 years	9.82%	3.22%	9.45%	4.54%	-	-	9.55%	18.02%	14.06%	18.04%	4.07%	0.83%

bills face.

The historical yields (**Figure 4**) also show that since 2012, government bond yields have consistently performed better than bank bills, displaying a stable return for medium-term investments. The bank bills exhibit similar yield movements over the period, with the 90-day bank bill's volatile movement



before 2012 reflecting bank bills' sensitivity to market conditions.

Equities benefit from steady dividend growth and reinvestment compounding in the long run and remain the highest-returning asset class. **Figure 5** illustrates how the accumulation index outperforms the price index, highlighting the significance of dividend reinvestment. The inverse relationship between the P/E ratio and dividend yield (**Figure 6**) also suggests that dividend-paying equities provide stable income despite price fluctuations, making them suitable for long-term liability matching.

Figure 5: Historical Index of Australian Equities (Dec 2004 - Dec 2024)



Figure 6: P/E Ratio and Dividend Yield of Australian Equities (Dec 2004 - Dec 2024)



Section 3 - Methodology

To determine AAG's long-term financial position, a projection of cashflows was projected for the next 30 years (2025 – 2054). Asset cash flows depend on asset portfolio allocations, which rely on the timing and nature of liabilities' cash flows. The following steps were conducted to forecast liability cash flows:

Step	Description	Inputs Given	Assumptions	Calculation Approach
1	Project number of customers per year	2024 customer population New entrant projections (2025 – 2030) Mortality rates (Age 60 – 88)	Entry is allowed only at age 60. Customers exit only via death. Mortality rates are national and max age = 120. New entrants 1/3 male, 2/3 female.	Start with 2024 population. Forecast 2030 – 2054 new entrants and add them annually. Extrapolate mortality rates to ages 88 to 120 and apply rates per year. Sum female and male populations.
2	Determine age profiles	2024 customer age profile	Customers have similar age profiles across ages 60-69, 70-79, 80-89, and 90-120.	Group customers into age groups each year and calculate population average age per year.
3	Calculate costs per year	2024 base cost per customer Age care inflation (2017 – 2024) Rate of increase in use of age care (2017 – 2024)	Rate of increase in use of age care is linked to a unit increase in average age of population. Costs rise with age (Lowest: 60-69; Highest: 90-120). Ages 90-120 have base cost of \$10,000. Costs increase due to inflation and ageing.	Use Excel SOLVER to find cost weights per age group. Calculate T+1 costs = $T * (1 + \text{inflation}) \times (1 + \text{rate of increase in use of age care})^{\Delta(\text{change in average age})}$ for each age group. Multiply cost per age group with population to get cash outflows.
4	Project customer entry fees	2024 entry fee = \$100K per entrant	Entry fees rise with age care inflation.	Cash inflow = entry fee x new entrants
5	Calculate net cashflows	Outputs from Steps 1-4	Steps 1-4 projected from 2025-2054. Inflows are collected at the start of year and costs are incurred at year end.	Net cashflows = Cash inflow – cash inflows. Assess financial positions per year.

After determining liabilities' cashflows, the asset portfolio cashflows are projected:

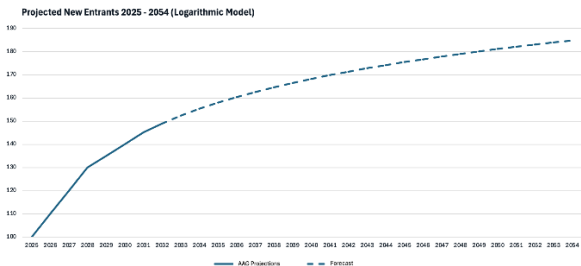
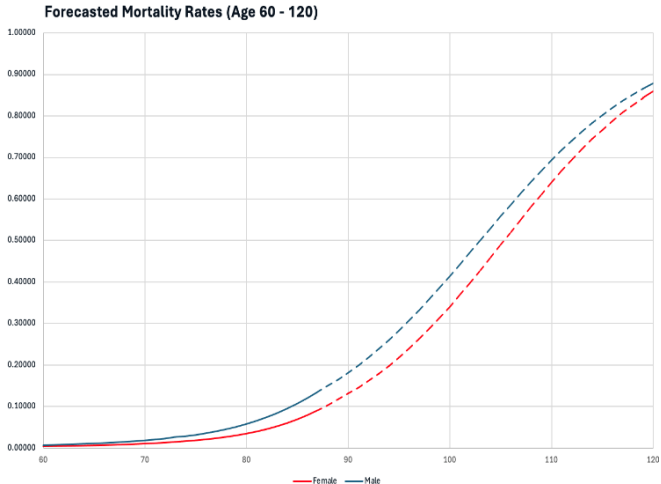
Step	Description	Inputs Given	Assumptions	Calculation Approach
1	Determine asset allocation	2024 portfolio value = \$60M Historical yields and growth of asset portfolio.	Historical data reflects future trends.	Start with a portfolio allocation for the four asset types.
2	Calculate cash available for investment	Customer entry fee (liability model) Projected total customer costs (liability model)	A buffer is applied to liabilities before determining amount of free cash flow. Buffer calculated at beginning of year based on projected liability for the year.	Calculate buffer amount. Investment cash = Buffer – customer entry fees
3	Project returns	Portfolio allocation (Step 1).	All rates are fixed over 30 years. Bonds and equity returns are semi-annual. Payouts occur year-end.	Calculate return per asset class.
4	Determine net profit	Asset returns (Step 3)	Returns can be reinvested into assets at the end of the year. No tax or GST.	Net profit = Cash from customer – cash used for investment + asset returns – liabilities. Decide if net profit is used to buy more assets or keep as cash and assess asset portfolio and financial position.
5	Repeat Step 2-5	Outputs from Steps 1-4	Steps 1-4 projected from 2025-2054. Rebalancing can occur at year-end.	Repeat Step 2-5 for 2025-2054.

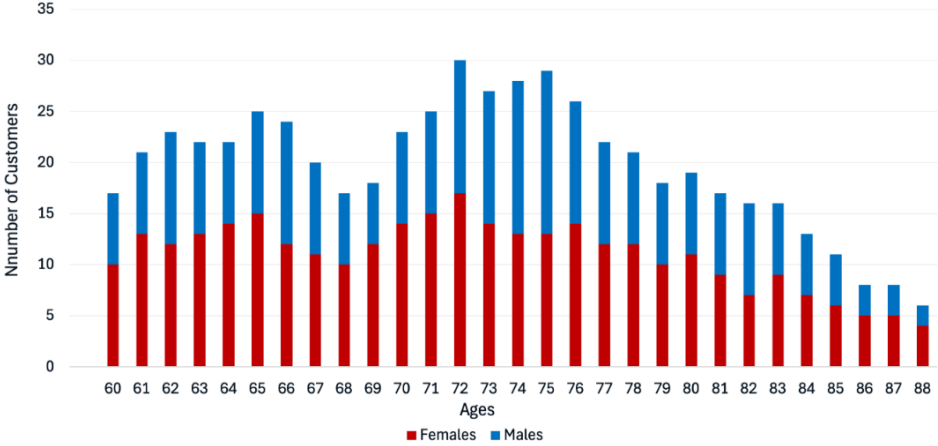
While the projection methodologies provide a structured approach to forecast and assess AAG's long-term cashflows, there are limitations:

- Assumptions change over 30 years.
- External macro pressures are not accounted for (e.g. regulatory requirements).
- Timing of cashflows do not accurately reflect AAG's daily operations.

Section 4 - Assumptions & Justifications

The assumptions behind the cashflow models and their materiality were determined as follows:

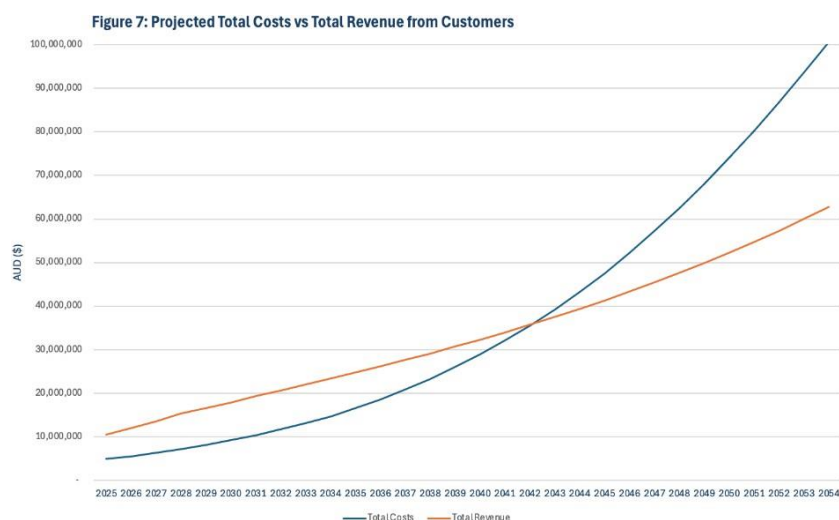
Assumption	Rationale
New customer projections	<p>Per AAG's policy, new entrants can join within 12 months of their 60th birthday. Forecasts from 2025-2030 show linear growth from 2025-2029, followed by a slight decline in 2030. Due to operational constraints, a maximum capacity ceiling via a logarithmic model was introduced to prevent overestimations. Entry rate decreases may have moderate financial impact but can be controlled via marketing or advertising.</p>  <p>Gender ratio for new entrants was based on Australia's 2023 aged care findings (AIHW, 2024). Immaterial as aged care costs are independent of gender, following an age-based structure.</p>
Customers exiting via death	<p>AAG does not require customers to remain in aged care services for life. However, to be conservative AAG assumes customers exit only due to death with early exits reducing liabilities.</p> <p>AAG provided mortality rates for ages 60-88, following an exponential trend. The rates are assumed to reflect national trends as they align with Australian Life Tables (Australian Government Actuary, 2024). Life tables indicate mortality rates increase at a decreasing rate beyond age 90, so forecasted rates followed a similar pattern. Ages were projected up to 120 for extreme longevity cases (which could be material) and ensure comprehensive liability projections.</p> 

Age profile groups	<p>Customers have been grouped into age categories: 60-69, 70-79, 80-89, and 90-120. Figure 3 shows that the age distributions for 60-69 and 70-79 are similar for both genders, indicating that customers within these groups exhibit comparable age profiles. However, the 80-89 group shows a declining trend, suggesting a shift in behaviour.</p> <p>Figure 3: AAG Existing Customer Age Profile</p>  <p>Ages 90+ have a separate category as no existing customers are in this range. Age groups ensure model differentiates age groups and better reflects cost structures and resource allocation for each cohort. Moderately material assumption to financial projections as aged care costs increases with age, but costs are driven by ageing trends rather than specific age group structures.</p>
Rate of increase in use of age care	<p>The rate is assumed to be linked to a unit increase in the average population age. From 2017 to 2024, AAG's rate averaged 4.08% with a low standard deviation of 0.33%, suggesting stability and making it a reliable estimate for long-term projections.</p> <p>Rate is considered conservative as it exceeds general inflation and closely aligns with aged care cost inflation, ensuring a realistic yet cautious approach to forecasting. Material assumption as it compounds age inflation rates - any minor changes would have compounding effects on costs.</p>
Cost per age groups	<p>The weighted average expense per customer (\$7,750) varies by age:</p> <ul style="list-style-type: none"> • 60-69: \$6,500 • 70-79: \$8,300 • 80-89: \$8,840 • 90+: \$10,000 <p>Costs were derived using Excel SOLVER based on population weights. Age 90+ was assigned a cost to reflect higher care intensity for that cohort. Highly material assumption, as incorrect estimates lead to funding shortfalls or excess reserves.</p>
Cost increase driven by inflation and ageing	<p>Costs are driven by aged care inflation, including wage growth, demand, and higher costs for specialized care (AGDHC, 2024). From 2017 to 2024, AAG's rate averaged 4.16% with a low standard deviation of 0.30%, suggesting stability and making it a reliable estimate for long-term projections. Materiality is consistent with cost per age group assumption.</p>
Entry fees	<p>\$100,000 entry fee is assumed to increase with aged care inflation to align with rising costs. Low materiality as AAG controls fee adjustments.</p>
Timing of cashflows	<p>Entry fees collected at start of year, while liabilities are paid at year-end, allowing AAG to invest cashflows before expenses are incurred. Highly material, as continuous liability payments could create liquidity constraints, affecting investment opportunities.</p>

Buffer on liabilities	<p>AAG sets buffer to be conservative:</p> <ul style="list-style-type: none">50% (Years 1-10): Ensures liquidity as portfolio is built.30% (Years 11-20): Maintains reserves while increasing investments.10% (Years 21-30): Reflects mature portfolio with stable funding. <p>Material, as excessive buffers reduce investment efficiency while low buffers expose AAG to downturns.</p>																																																																																																							
Projecting asset returns	<p>Yield and growth rates are assumed as constant over 30 years, based on 10-year historical values to capture recent market conditions while avoiding outdated data. Historical data assumed as a reasonable indicator of future trends.</p> <p>10-year average and volatility offer higher returns with lower risk compared to shorter timeframes, ensuring stable projections and reduced short-term volatility risks.</p> <p>Dividends and coupons being semi-annual align with market practices.</p> <p>Assumption is highly material as investment returns fund liabilities. Overestimating returns risks insufficient reserves, while underestimation limits asset growth and funding sustainability.</p> <table><caption>Table 2: Historical Average Returns and Volatility</caption><tr><th rowspan="2">Period</th><th colspan="2">10-year Government Bonds</th><th colspan="2">90 Day Bank Bills</th><th colspan="2">30 Day Bank Bills</th><th colspan="2">Price Index</th><th colspan="2">Accumulation Index</th><th colspan="2">Dividends</th></tr><tr><th>Average</th><th>Volatility</th><th>Average</th><th>Volatility</th><th>Average</th><th>Volatility</th><th>Average</th><th>Volatility</th><th>Average</th><th>Volatility</th><th>Average</th><th>Volatility</th></tr><tr><td>1 year</td><td>5.84%</td><td>0.33%</td><td>4.71%</td><td>0.30%</td><td>4.64%</td><td>0.27%</td><td>(12.13%)</td><td>8.83%</td><td>-8.77%</td><td>8.71%</td><td>3.60%</td><td>0.31%</td></tr><tr><td>3 years</td><td>5.93%</td><td>0.47%</td><td>5.28%</td><td>0.73%</td><td>5.26%</td><td>0.70%</td><td>(1.56%)</td><td>11.39%</td><td>1.94%</td><td>11.36%</td><td>3.43%</td><td>0.24%</td></tr><tr><td>5 years</td><td>5.86%</td><td>0.49%</td><td>5.17%</td><td>0.60%</td><td>5.14%</td><td>0.57%</td><td>2.82%</td><td>11.67%</td><td>6.54%</td><td>11.70%</td><td>3.46%</td><td>0.25%</td></tr><tr><td>10 years</td><td>7.00%</td><td>1.48%</td><td>5.69%</td><td>1.07%</td><td>5.65%</td><td>1.03%</td><td>6.85%</td><td>12.94%</td><td>10.91%</td><td>12.93%</td><td>3.59%</td><td>0.32%</td></tr><tr><td>15 years</td><td>8.59%</td><td>2.73%</td><td>7.92%</td><td>3.99%</td><td>-</td><td>-</td><td>4.81%</td><td>13.62%</td><td>8.87%</td><td>13.59%</td><td>4.06%</td><td>0.88%</td></tr><tr><td>20 years</td><td>9.82%</td><td>3.22%</td><td>9.45%</td><td>4.54%</td><td>-</td><td>-</td><td>9.55%</td><td>18.02%</td><td>14.06%</td><td>18.04%</td><td>4.07%</td><td>0.83%</td></tr></table>	Period	10-year Government Bonds		90 Day Bank Bills		30 Day Bank Bills		Price Index		Accumulation Index		Dividends		Average	Volatility	Average	Volatility	Average	Volatility	Average	Volatility	Average	Volatility	Average	Volatility	1 year	5.84%	0.33%	4.71%	0.30%	4.64%	0.27%	(12.13%)	8.83%	-8.77%	8.71%	3.60%	0.31%	3 years	5.93%	0.47%	5.28%	0.73%	5.26%	0.70%	(1.56%)	11.39%	1.94%	11.36%	3.43%	0.24%	5 years	5.86%	0.49%	5.17%	0.60%	5.14%	0.57%	2.82%	11.67%	6.54%	11.70%	3.46%	0.25%	10 years	7.00%	1.48%	5.69%	1.07%	5.65%	1.03%	6.85%	12.94%	10.91%	12.93%	3.59%	0.32%	15 years	8.59%	2.73%	7.92%	3.99%	-	-	4.81%	13.62%	8.87%	13.59%	4.06%	0.88%	20 years	9.82%	3.22%	9.45%	4.54%	-	-	9.55%	18.02%	14.06%	18.04%	4.07%	0.83%
Period	10-year Government Bonds		90 Day Bank Bills		30 Day Bank Bills		Price Index		Accumulation Index		Dividends																																																																																													
	Average	Volatility	Average	Volatility	Average	Volatility	Average	Volatility	Average	Volatility	Average	Volatility																																																																																												
1 year	5.84%	0.33%	4.71%	0.30%	4.64%	0.27%	(12.13%)	8.83%	-8.77%	8.71%	3.60%	0.31%																																																																																												
3 years	5.93%	0.47%	5.28%	0.73%	5.26%	0.70%	(1.56%)	11.39%	1.94%	11.36%	3.43%	0.24%																																																																																												
5 years	5.86%	0.49%	5.17%	0.60%	5.14%	0.57%	2.82%	11.67%	6.54%	11.70%	3.46%	0.25%																																																																																												
10 years	7.00%	1.48%	5.69%	1.07%	5.65%	1.03%	6.85%	12.94%	10.91%	12.93%	3.59%	0.32%																																																																																												
15 years	8.59%	2.73%	7.92%	3.99%	-	-	4.81%	13.62%	8.87%	13.59%	4.06%	0.88%																																																																																												
20 years	9.82%	3.22%	9.45%	4.54%	-	-	9.55%	18.02%	14.06%	18.04%	4.07%	0.83%																																																																																												

Section 5 - Asset Allocation Recommendation

AAG's liabilities increase as customers require more care while revenue rises at a slower rate due to capped customer growth (**Figure 7**). The gap between revenue and costs requires an investment strategy that prioritise stability early on and liquidity as costs spike.



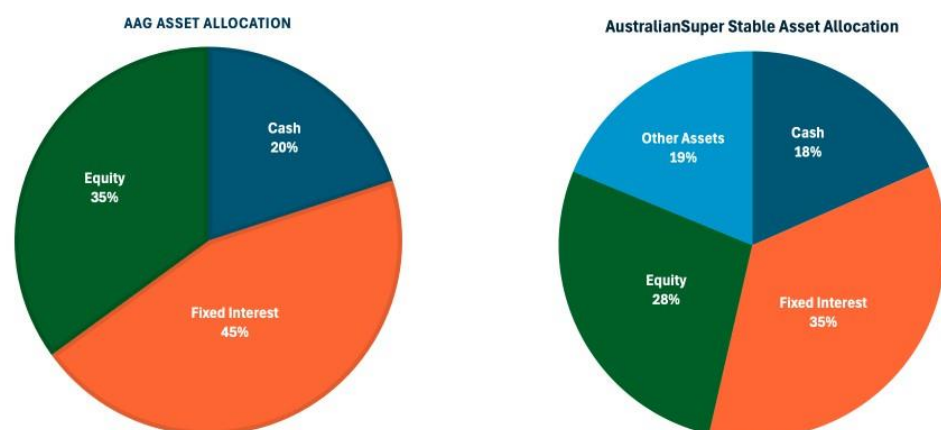
An initial allocation of 45% government bonds, 35% equities, and 20% bank bills is recommended. Bonds provide stable cash flows (7% return, 1.48% volatility), equities support long-term income

growth (3.59% yield, 0.32% volatility), and bank bills ensure short-term liquidity (5.65%–5.69% returns). AAG should use returns to reinvest in 70% bonds, 20% equities, and 10% bank bills, compounding inflows and strengthening liability coverage. Then, in 2044, reinvestments should be in the most liquid assets (bank bills 35%, equities 30%), ensuring enough liquidity to bridge the gap between revenue and rising aged care costs. By 2054, the portfolio will comprise 70% bank bills, 25% equities, and 5% cash (**Table 3**).

Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Net Cash Inflow/(Outflow)	5,708,767	6,585,460	7,431,164	8,227,464	9,415,632	10,709,672	12,111,390	13,615,706	15,223,269	120,531,507
Net Profit Margin	41.74%	30.69%	30.41%	30.04%	31.24%	32.05%	32.78%	33.58%	34.38%	79.41%
Asset Allocation:										
Cash	0.00%	13.47%	14.86%	15.91%	14.90%	14.30%	13.77%	13.14%	12.51%	11.90%
Government Bonds	45.00%	48.37%	56.86%	65.46%	68.81%	71.66%	74.11%	76.25%	78.13%	79.76%
Equities	35.00%	9.33%	9.70%	2.12%	2.04%	1.95%	1.88%	1.81%	1.74%	1.68%
90-day Bank Bills	10.00%	9.33%	1.38%	1.46%	1.38%	1.32%	1.28%	1.23%	1.18%	1.14%
30-day Bank Bills	10.00%	19.51%	17.20%	15.06%	12.87%	10.76%	8.96%	7.56%	6.44%	5.52%
Year	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Net Cash Inflow/(Outflow)	29,978,468	30,598,402	34,391,121	37,934,223	41,936,316	46,226,404	50,680,252	55,359,189	60,286,999	55,711,891
Net Profit Margin	64.45%	37.70%	39.82%	40.16%	40.81%	41.35%	41.80%	42.23%	42.64%	39.13%
Asset Allocation:										
Cash	1.37%	12.26%	10.25%	9.58%	8.87%	8.32%	7.84%	7.40%	7.00%	6.64%
Government Bonds	69.04%	60.92%	57.21%	53.93%	51.32%	49.13%	47.27%	45.70%	44.36%	43.21%
Equities	4.93%	4.47%	3.84%	3.36%	2.97%	2.64%	2.37%	2.15%	1.95%	1.78%
90-day Bank Bills	4.93%	6.92%	7.99%	8.91%	9.65%	10.26%	10.78%	11.22%	11.59%	11.92%
30-day Bank Bills	19.73%	15.44%	20.71%	24.22%	27.20%	29.65%	31.74%	33.54%	35.09%	36.45%
Year	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
Net Cash Inflow/(Outflow)	55,149,261	67,265,241	62,994,000	74,063,418	77,670,298	81,354,812	85,020,913	88,703,967	92,425,351	64,640,530
Net Profit Margin	53.71%	41.91%	37.07%	41.51%	39.87%	39.91%	39.90%	39.90%	39.88%	30.82%
Asset Allocation:										
Cash	0.00%	5.42%	6.34%	5.21%	5.92%	7.12%	6.77%	6.22%	5.72%	5.27%
Government Bonds	42.12%	38.13%	33.99%	30.31%	26.47%	3.43%	0.00%	0.00%	0.00%	0.00%
Equities	9.12%	10.79%	12.62%	14.15%	15.80%	21.72%	23.34%	24.06%	24.69%	25.23%
90-day Bank Bills	10.56%	12.20%	13.98%	15.48%	17.09%	23.28%	24.85%	25.48%	26.03%	26.50%
30-day Bank Bills	38.20%	33.47%	33.06%	34.84%	34.72%	44.45%	45.05%	44.24%	43.57%	43.00%

Comparing AAG's starting allocation with AustralianSuper's Stable Asset allocations (**Figure 8**) (AustralianSuper, 2025), as both want to achieve liquidity and stability, AAG's 45% fixed interest (bonds) and 20% cash allocation (bills and cash) align with Stable's 35% fixed interest and 18.4% cash. However, while Stable maintains 28% equities and 19% in infrastructure, property, and private equity, AAG maintains 35% equities but increases liquidity through bank bills for predictable aged care funding. By 2044, 70% of AAG's portfolio will move into bank bills, reinforcing liquidity as aged care costs increase. Unlike AustralianSuper's static model, AAG requires a dynamic process for liquidity dominance to ensure it meets obligations. Furthermore, AAG's portfolio is exposed to fewer asset types than AustralianSuper's.

Figure 8: Comparison of Asset Allocations



A stress test compared the initial portfolio to high equity (70% equities) and high bond (70% bonds) portfolios. All performed similarly early on, but high equity declined sharply when equity growth dropped 50% (Figure 9). When equity growth and bond yields fell 50% (Figure 10), all strategies weakened, with the recommended strategy performing the best. High bond strategy remained stable

when only bond yields declined (Figure 11), while high equity performed the worst again. In all three scenarios, high equity is worst-off. The high bond strategy remains stable, but when both equities and bonds are affected, the strategy performs worse than the recommended strategy. The recommended strategy integrates high bond elements later, ensuring stability while balancing early growth and later shifts into liquidity, adapting over time to meet liabilities without sacrificing financial stability, making it the most resilient approach.

Figure 9: Equity market growth drops by 50%

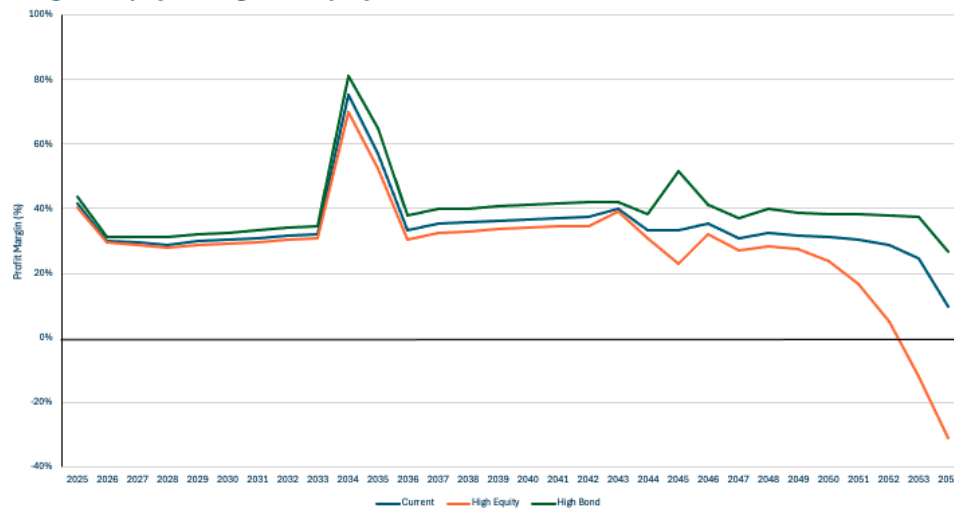
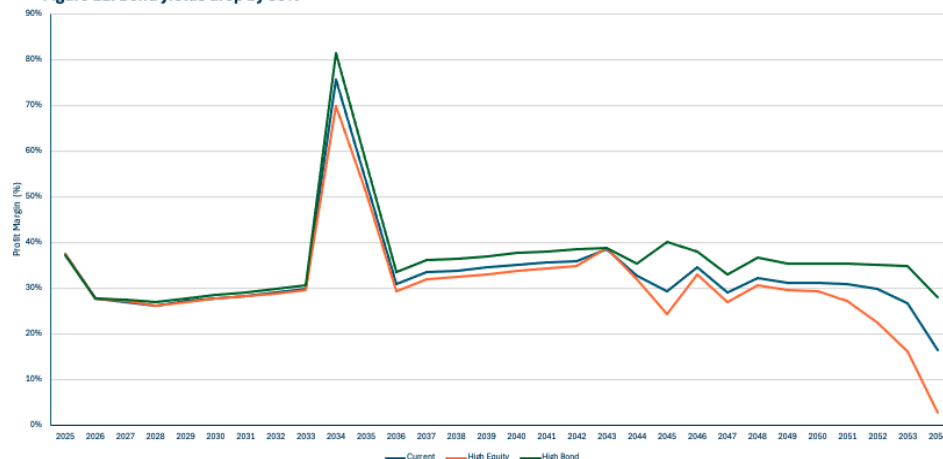


Figure 10: Equity market growth and bond yields drop by 50%



Figure 11: Bond yields drop by 50%





Section 6 – Limitations and Conclusions

The recommended model relies on historical market data and deterministic projections, which do not fully capture realistic market behaviours or account for stochastic market fluctuations. The model's assumptions are also simplistic and based on past trends, which may not represent future conditions. Any significant deviation from these assumptions could lead to material impacts on financial estimates, potentially causing the asset portfolio to face liquidity constraints or funding shortfalls. Therefore, it is crucial to exercise caution when relying on these assumptions, as they may not always hold.

To mitigate, the Board should implement periodic reviews to rebalance the portfolio in response to evolving market conditions. Regular stress testing and maintaining a liquidity buffer, as modelled, would serve as essential safeguards against unexpected downturns. Given that the recommended model relies heavily on bond reinvestments, the Board should closely monitor the interest-rate environment and consider inflation-protected securities where necessary.

In conclusion, the recommended asset portfolio begins with 45% government bonds, 35% equities, and 20% bank bills, gradually shifting towards higher fixed-income and liquidity assets to ensure stability as aged care costs increase. With ongoing monitoring, stress testing, and proactive risk management, the strategy will help AAG maintain long-term financial sustainability and meet its liabilities for the next 30 years.

References

Australian Government Actuary (2024) *Australian Life Tables 2020-22, Australian Life Tables 2020-22* / Australian Government Actuary. Available at: <https://aga.gov.au/publications/life-tables/australian-life-tables-2020-22> (Accessed: 04 March 2025).

Australian Government Department of Health and Aged Care (2024) *Final report of the aged care taskforce, Australian Government Department of Health and Aged Care*. Available at: <https://www.health.gov.au/resources/publications/final-report-of-the-aged-care-taskforce?language=en> (Accessed: 04 March 2025).

Australian Institute of Health and Welfare (2024) *People using aged care, AIHW Gen*. Available at: <https://www.gen-agedcaredata.gov.au/topics/people-using-aged-care> (Accessed: 04 March 2025).

AustralianSuper (2025) *Your PreMixed Investment Options, AustralianSuper*. Available at: <https://www.australiansuper.com/investments/your-investment-options/pre-mixed-investment-choice> (Accessed: 04 March 2025).