# **Duration Extension Analysis of the Shareholder Portfolio**

## 1. Overview

This report assesses the implications of extending the duration of the Shareholder Portfolio from its current position of approximately three years to alternative strategies with five-year and seven-year duration targets. The client’s brief highlighted a desire to evaluate the potential incremental yield and diversification benefits of a longer duration strategy against the risks of greater interest rate sensitivity, spread risk, and mark-to-market volatility.

Our analysis reviews both historical performance (over the past five years) and forward-looking expectations (over the next three to five years). It also considers key risk/return measures such as yield, volatility, DV01/CV01, option-adjusted spread, credit quality, and sector exposures. Importantly, we discuss the potential implications for APRA capital requirements, acknowledging that precise capital impacts cannot be quantified without more detailed liability and balance sheet data from the client.

## 2. Current 3-Year Portfolio

The current Shareholder Portfolio has a modified duration of around three years. This positioning provides a balance between capturing a modest yield premium relative to cash and maintaining low mark-to-market volatility.

**Historical performance** over the past five years has been broadly consistent, with returns largely driven by carry and roll-down, supported by stable credit exposures. Volatility has been contained, reflecting the relatively low interest rate sensitivity of the portfolio. Risk-adjusted returns (Sharpe ratio) compare favourably with longer-duration alternatives.

**Forward-looking expectations** suggest that the portfolio will continue to generate steady returns with low sensitivity to rate shocks. DV01 and spread duration exposures remain modest, and convexity is limited. Importantly, the three-year positioning aligns most closely with the liability duration of the shareholder funds, thereby optimising capital efficiency under APRA’s framework.

## 3. 5-Year Duration Portfolio

Extending the portfolio to a five-year duration introduces a higher level of interest rate sensitivity, with DV01 rising meaningfully compared to the current three-year stance. Historical analysis indicates slightly higher total returns, reflecting additional carry and roll-down benefits, but also higher volatility and greater drawdown potential in periods of rising yields.

Looking forward, a five-year portfolio could provide a modest yield advantage over the three-year base case. However, the incremental benefit is partially offset by the greater mark-to-market risk. From a risk-adjusted return perspective, the Sharpe ratio may not materially improve relative to the current strategy.

One potential benefit of the five-year portfolio is diversification. Extending duration slightly may provide a degree of offset against risk in the growth asset portfolio, depending on the interaction between interest rates and equity markets in stress scenarios. However, this benefit is uncertain and may not outweigh the reduced capital efficiency from extending duration away from the liability profile.

## 4. 7-Year Duration Portfolio

A seven-year duration portfolio represents a material departure from the current strategy. Historical results suggest that while long-duration portfolios can deliver strong returns in falling-rate environments, the associated volatility is significantly higher. Risk metrics show that DV01 and convexity exposures are substantially larger, amplifying sensitivity to both parallel shifts and curve-steepening scenarios.

On a forward-looking basis, the incremental yield pickup is not sufficient to compensate for the additional volatility and drawdown risk. Critically, this positioning would introduce a significant mismatch against the liability profile of the shareholder funds, substantially increasing net duration risk. This would likely reduce capital efficiency under APRA metrics and could expose the fund to unnecessary mark-to-market volatility.

For these reasons, the seven-year strategy is not considered appropriate for the client’s objectives.

## 5. Discussion

Across the three scenarios, the central trade-off is between additional yield and diversification benefits on the one hand, and higher volatility, interest rate sensitivity, and capital requirements on the other.

* The **3-year portfolio** aligns with the client’s liability duration, offers the most capital-efficient outcome, and has historically delivered stable risk-adjusted returns.
* The **5-year portfolio** could be considered as an incremental step, potentially offering modest diversification benefits relative to growth assets. However, this is uncertain, and the incremental yield pickup is relatively small compared to the increase in volatility and capital requirements.
* The **7-year portfolio** is clearly misaligned with the liability profile, introduces substantial unwanted duration risk, and is unlikely to be capital efficient.

While the analysis provides a useful directional view, the precise impact on capital requirements cannot be assessed without more detailed information on liability matching and APRA’s treatment of specific asset exposures. This remains an important caveat to the results.

## 6. Recommendation

Based on the analysis, we recommend maintaining the current **3-year portfolio** as the most appropriate and capital-efficient strategy for the Shareholder Fund. This positioning balances yield, volatility, and liability alignment, while keeping APRA capital charges contained.

The **5-year portfolio** could be considered as a secondary option if the client wishes to modestly extend duration in order to improve diversification relative to growth assets. However, this should only be pursued after further analysis of the total balance sheet context, particularly the correlation between growth assets and fixed income in stressed market conditions.

We do **not recommend the 7-year portfolio**, as it introduces a significant liability mismatch and would likely prove inefficient from both a risk and capital perspective.

Would you like me to polish this into a **client-ready version with a more formal consulting/report tone** (shorter sentences, less technical detail in the narrative, with key numbers and charts highlighted in tables/graphs), or keep it as a more **technical/internal draft** to hand over with your quantitative exhibits?

# **Duration Extension Analysis of the Shareholder Portfolio**

## 1. Overview

Macquarie Fixed Income has been asked to evaluate the implications of extending the Shareholder Portfolio’s duration from its current ~3 years to alternative 5-year and 7-year profiles.

The client is seeking to understand:

* The potential **incremental yield and diversification benefits** of extending duration.
* The associated **risks** — greater sensitivity to interest rate and spread movements, and higher mark-to-market volatility.
* The impact on **historical performance, forward-looking risk/return expectations, and capital efficiency under APRA**.
* The effect on **key fixed income metrics** (DV01, CV01, duration, spread exposure, OAS, yield, and credit quality).
* Sensitivity to **yield curve steepening and flattening scenarios**.
* Whether there is an “optimal” duration range balancing risk and return.

This report summarises our findings, with detailed metrics provided in the accompanying Excel pack.

## 2. Current 3-Year Portfolio

The current portfolio is positioned around a three-year modified duration, broadly aligned with the liability profile of the shareholder funds.

**Key metrics** (illustrative – fill with your results):

* Yield: X%
* OAS: X bps
* Modified duration: ~3 years
* DV01: $Xk per bp
* Spread duration: X years
* Average rating: A / BBB+
* Volatility (5Y realised): X%
* Sharpe ratio (5Y): X

**Historical performance (5 years):**  
Returns have been steady, with low volatility and strong risk-adjusted outcomes. Drawdowns were modest compared to longer-duration portfolios.

**Forward-looking expectations:**  
The portfolio is expected to continue delivering stable returns with low mark-to-market volatility. Its alignment with liability duration supports efficient capital treatment under APRA.

## 3. 5-Year Duration Portfolio

Extending to five years introduces greater rate sensitivity while offering incremental carry and roll-down benefits.

**Key metrics:**

* Yield: ~X bps higher than 3Y
* OAS: broadly unchanged
* Modified duration: ~5 years
* DV01: ~X% higher than 3Y
* Volatility (5Y realised): X% (higher than 3Y)
* Sharpe ratio (5Y): broadly similar to 3Y

**Historical performance:**  
The 5Y portfolio delivered slightly higher returns than the 3Y over the past five years, but with larger drawdowns during periods of rising yields.

**Forward-looking expectations:**  
Projected returns are modestly higher, though not significantly so on a risk-adjusted basis. Diversification benefits may exist if longer-duration fixed income offsets growth-asset volatility in stress scenarios, but this is uncertain.

**Curve scenarios:**

* Flattening: 5Y portfolio outperforms 3Y due to higher carry and roll-down.
* Steepening: 5Y underperforms, reflecting higher exposure to long-end rate moves.

**Capital implications:**  
APRA charges likely increase relative to 3Y, though precise impacts depend on liability modelling.

## 4. 7-Year Duration Portfolio

A seven-year profile represents a material departure from the current strategy, with significantly higher rate and convexity risk.

**Key metrics:**

* Yield: ~X bps higher than 3Y
* OAS: unchanged
* Modified duration: ~7 years
* DV01: roughly double the 3Y portfolio
* Volatility: materially higher
* Sharpe ratio: mixed (period-dependent, not consistently better)

**Historical performance:**  
Returns were stronger in falling-rate environments but highly volatile, with significant drawdowns when yields rose.

**Forward-looking expectations:**  
Incremental yield pickup is not sufficient to compensate for the additional volatility.

**Curve scenarios:**

* Flattening: strongest outperformance.
* Steepening: largest underperformance.

**Capital implications:**  
Extending to seven years would likely create a large liability mismatch, substantially increasing net duration risk and reducing capital efficiency under APRA.

## 5. Discussion

**Risk/return trade-offs:**

* The 3Y portfolio delivers steady returns with the lowest volatility and is the most capital efficient given its alignment with liability duration.
* The 5Y portfolio provides modest incremental yield and may diversify growth-asset risk, but with higher volatility and uncertain capital efficiency benefits.
* The 7Y portfolio introduces substantial and unwanted duration risk, with materially higher volatility and likely punitive capital charges.

**Sharpe ratios and risk-adjusted returns:**  
On a five-year lookback, the 3Y and 5Y portfolios delivered similar Sharpe ratios, while the 7Y was less consistent.

**Sector and rating exposures:**  
Extending duration naturally tilts exposure towards sovereign and semi-government bonds. Credit quality remains broadly stable across scenarios, though longer portfolios exhibit higher sensitivity to spread moves.

**Capital considerations:**  
Without full liability data, capital impacts cannot be precisely modelled. However, directionally, duration extension reduces capital efficiency in a non-linear fashion.

## 6. Recommendation

We recommend maintaining the current **3-year portfolio** as the most appropriate and capital-efficient strategy. It best matches liability duration, minimises mark-to-market volatility, and is consistent with APRA capital efficiency.

The **5-year portfolio** could be considered as an incremental extension if the client seeks to test diversification benefits relative to growth assets. This should only be pursued after further liability and capital modelling.

The **7-year portfolio** is **not recommended**, given the substantial liability mismatch, higher volatility, and likely adverse capital consequences.

## **Table 1. Key Metrics — Current 3-Year Portfolio**

| **Metric** | **Value** | **Commentary** |
| --- | --- | --- |
| Yield (to maturity) | X% | Stable carry profile, modest premium over cash. |
| Option-Adjusted Spread (OAS) | X bps | Consistent with credit quality. |
| Modified Duration | ~3.0 yrs | Closely aligned with liability profile. |
| DV01 | $Xk / bp | Relatively low interest rate sensitivity. |
| Spread Duration | X yrs | Limited exposure to spread widening. |
| Convexity (CV01) | X | Low convexity impact. |
| Average Credit Rating | A / BBB+ | High-quality portfolio. |
| 5Y Realised Volatility | X% | Lowest of the three portfolios. |
| 5Y Sharpe Ratio | X | Strong risk-adjusted returns. |

## **Table 2. Key Metrics — 5-Year Duration Portfolio**

| **Metric** | **Value** | **Commentary** |
| --- | --- | --- |
| Yield (to maturity) | X% (+~X bps vs 3Y) | Incremental yield pickup. |
| Option-Adjusted Spread (OAS) | X bps | Little change from 3Y. |
| Modified Duration | ~5.0 yrs | Higher rate sensitivity. |
| DV01 | $Xk / bp (+~X% vs 3Y) | Larger mark-to-market swings. |
| Spread Duration | X yrs | More exposed to spread moves. |
| Convexity (CV01) | X | Higher curve sensitivity. |
| Average Credit Rating | A / BBB+ | Similar to 3Y. |
| 5Y Realised Volatility | X% (+~X% vs 3Y) | Noticeable increase. |
| 5Y Sharpe Ratio | X | Comparable to 3Y, not clearly superior. |

## **Table 3. Key Metrics — 7-Year Duration Portfolio**

| **Metric** | **Value** | **Commentary** |
| --- | --- | --- |
| Yield (to maturity) | X% (+~X bps vs 3Y) | Highest carry but not enough to offset risk. |
| Option-Adjusted Spread (OAS) | X bps | Unchanged. |
| Modified Duration | ~7.0 yrs | Significant duration extension. |
| DV01 | $Xk / bp (~2x 3Y) | Very high rate sensitivity. |
| Spread Duration | X yrs | Increased exposure to spreads. |
| Convexity (CV01) | X | Strong convexity effects. |
| Average Credit Rating | A / BBB+ | No material change. |
| 5Y Realised Volatility | X% (materially higher) | Highest volatility of all scenarios. |
| 5Y Sharpe Ratio | X | Inconsistent, weaker in rising-rate periods. |

## **Table 4. Scenario Analysis — Curve Outcomes (Illustrative)**

| **Scenario** | **3Y Portfolio** | **5Y Portfolio** | **7Y Portfolio** | **Commentary** |
| --- | --- | --- | --- | --- |
| Parallel -50bp | +X% | +X% | +X% | Longer portfolios outperform in rallies. |
| Parallel +50bp | –X% | –X% | –X% | Losses amplified with duration. |
| Steepening | Flat / small loss | –X% | –X% | Longer portfolios underperform. |
| Flattening | Flat / small gain | +X% | ++X% | Longer portfolios benefit most. |

| **Metric / Consideration** | **3-Year Portfolio** | **5-Year Portfolio** | **7-Year Portfolio** | **Commentary** |
| --- | --- | --- | --- | --- |
| **Yield (to maturity)** | X% | X% (+~X bps) | X% (+~X bps) | Longer portfolios offer incremental yield. |
| **Modified Duration** | ~3.0 yrs | ~5.0 yrs | ~7.0 yrs | Clear step-up in rate sensitivity. |
| **DV01** | $Xk / bp | $Xk / bp (+~X%) | $Xk / bp (~2x) | Mark-to-market risk rises significantly. |
| **Spread Duration** | X yrs | X yrs (+~X%) | X yrs (+~X%) | More exposed to spread widening at longer durations. |
| **Convexity (CV01)** | Low | Moderate | High | Non-linear rate risk grows with duration. |
| **5Y Realised Volatility** | Lowest | Moderate (+~X%) | Highest (+~X%) | Volatility rises sharply with duration. |
| **Sharpe Ratio (5Y)** | Strong | Comparable | Weaker / inconsistent | 3Y most efficient risk-adjusted profile. |
| **Liability Alignment** | High (matches) | Moderate | Low (significant mismatch) | 3Y closest to liability duration. |
| **APRA Capital Efficiency** | Highest | Lower | Lowest | Capital charges rise non-linearly with duration. |
| **Curve Scenarios** | Most resilient | Balanced but exposed | Very sensitive | 7Y amplifies curve moves. |
| **Overall Assessment** | ✔ Preferred | △ Possible | ✘ Not suitable | 3Y best fit; 5Y conditional; 7Y inappropriate. |

# **Executive Summary**

## Purpose

Macquarie Fixed Income was asked to assess the implications of extending the Shareholder Portfolio’s duration from ~3 years to 5 years and 7 years. The client’s key objectives were to understand:

* The potential **incremental yield and diversification benefits** of extending duration.
* The **risks**: higher interest rate sensitivity, spread risk, and mark-to-market volatility.
* Impacts on **historical performance, forward-looking expectations, and APRA capital efficiency**.
* Relative portfolio exposures and sensitivities under **yield curve steepening/flattening scenarios**.

## Findings

* **3-Year Portfolio**
  + Closely aligned with liability duration.
  + Delivered stable returns with the lowest volatility and strongest risk-adjusted outcomes over the past 5 years.
  + Expected to remain the most **capital-efficient** strategy.
* **5-Year Portfolio**
  + Provides a modest yield pickup and some potential diversification relative to growth assets.
  + Volatility and DV01 rise meaningfully; Sharpe ratio is broadly similar to the 3Y portfolio.
  + Capital efficiency is reduced; diversification benefit is uncertain.
* **7-Year Portfolio**
  + Offers the highest yield but with materially higher volatility and rate sensitivity (DV01 ~2x 3Y).
  + Significant mismatch to liability duration.
  + Likely to **reduce capital efficiency** materially under APRA; not appropriate for shareholder funds.

## Comparative Summary

| **Portfolio** | **Yield** | **Risk/Volatility** | **Liability Alignment** | **Capital Efficiency** | **Overall View** |
| --- | --- | --- | --- | --- | --- |
| **3-Year** | Moderate | Lowest | Strong | Highest | ✔ Preferred |
| **5-Year** | Higher | Moderate | Partial | Lower | △ Possible |
| **7-Year** | Highest | Highest | Weak | Lowest | ✘ Not suitable |

## Recommendation

* **Maintain the 3-year portfolio** as the most appropriate strategy given its alignment with liabilities, capital efficiency, and strong risk-adjusted performance.
* The **5-year portfolio** may be considered as a secondary option if further analysis confirms diversification benefits against growth assets.
* The **7-year portfolio** should not be pursued, given the liability mismatch and adverse capital implications.
* Further work: liability-sensitive capital modelling is recommended to quantify APRA impacts with greater precision.

# **Proposed Report Layout**

## **Front Section**

**Cover Page**

* Title: Duration Extension Analysis of the Shareholder Portfolio
* Prepared for: [Client name]
* Prepared by: Macquarie Fixed Income
* Date

**Executive Summary (1 page)**

* Purpose and scope
* Headline findings (bullets)
* Summary table (3Y vs 5Y vs 7Y comparison)
* Recommendation

## **Main Report**

### **1. Overview (1 page)**

* Restate client brief.
* Scope of analysis (historical, forward-looking, risk/return metrics, capital).
* Approach (summary of methodology, Excel pack reference).

### **2. Current 3-Year Portfolio (2 pages)**

* Narrative overview (profile, performance, expectations).
* **Key Metrics Table (Table 1)**.
* Supporting chart(s): yield vs duration profile, historical returns.

### **3. 5-Year Portfolio (2 pages)**

* Narrative overview (incremental yield, risk trade-offs).
* **Key Metrics Table (Table 2)**.
* Supporting chart(s): historical volatility vs 3Y, scenario sensitivity.

### **4. 7-Year Portfolio (2 pages)**

* Narrative overview (higher risk, liability mismatch).
* **Key Metrics Table (Table 3)**.
* Supporting chart(s): convexity effects, drawdown illustration.

### **5. Discussion (2–3 pages)**

* Cross-comparison of portfolios.
* **Summary Comparison Table (Table 5)**.
* **Scenario Analysis Table (Table 4)** (flattening/steepening outcomes).
* Sector/rating exposures (insert chart or stacked bar).
* Capital implications (directional commentary + caveat).

### **6. Recommendation (1 page)**

* Clear preferred option (3Y).
* Conditional view on 5Y.
* Explicit rejection of 7Y.
* Next steps (further liability/capital modelling, balance sheet integration).

## **Back Section**

**Appendix (as needed)**

* Methodology detail (e.g., historical data source, curve scenarios).
* Expanded charts/tables not central to the main narrative.
* Glossary of fixed income terms (optional, if the audience is mixed).

**Excel Pack (separate file)**

* Full historical performance by year.
* DV01/CV01 ladders.
* Scenario analysis outputs.
* Sector/rating breakdowns.
* Sharpe ratios and risk-adjusted returns.

### **Design Notes**

* Keep main report **narrative + summary tables/charts**. No more than 3–4 tables in the body, everything else into the appendix/Excel pack.
* Use **consistent formatting** for Key Metrics tables (same order of metrics, aligned units).
* Visual cues (✔ △ ✘) in summary tables are very effective for board-level readers.