Fixed Income Securities and Credit Analysis
Assessment 3 – Individual Project

Portfolio Analysis and Risk Management for Australian Fixed Income Securities

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2.0 Introduction

This report presents a comprehensive analysis of an assigned six-bond Australian fixed-income portfolio. The investigation covers the portfolio's performance and tracking error relative to a benchmark, its interest rate risk profile managed through duration-based immunisation strategies, and an assessment of its overall credit quality.

The quantitative modelling, data processing, and visualisations presented herein were predominantly conducted using Python. This approach was chosen to facilitate a more sophisticated level of analysis and generate more detailed data visualisations than are typically feasible within a standard spreadsheet environment, thereby enhancing the overall quality of the assessment. The complete Python notebook containing all code is submitted as a supplementary file alongside this report and it is available by clicking here: [Python Code]

All market and financial data were sourced from the Refinitiv Eikon database, extracted via its native Excel add-in functions. For ease of verification, this data has been consolidated into a single master Excel workbook which is provided as a primary appendix. However, for practical implementation, the data was segregated into individual source files (e.g., for yields, historical prices) loaded into the Python notebook; the name of each individual file corresponds to a sheet within the master workbook. It should be noted that as an exception, the financial ratio analysis required for Section 2E was performed directly within Excel, using data also sourced from Refinitiv.

2A. Tracking Error Analysis

2A.1 Portfolio Overview

The portfolio under analysis is composed of six Australian fixed-income securities, encompassing both sovereign and corporate issuers. The key characteristics of each instrument, including the issuer, coupon rate, maturity date, and assigned portfolio weight, are detailed in Table_A1. A visual breakdown of the asset allocation is provided in Figure_A1. A preliminary review reveals a portfolio built with structural characteristics that conflict with a benchmark-tracking objective. While exhibiting some diversity in maturity, the portfolio is highly concentrated in the financial sector, with two Commonwealth Bank bonds alone constituting 47% of the total exposure. Furthermore, the inclusion of a single sovereign bond results in a significant structural underweighting of government debt, a core component of most broad market benchmarks. This composition suggests a strategy oriented towards yield or capital appreciation rather than passive index replication.

2A.2 Data and Methodology

Daily Bid and Ask price data for each bond and the benchmark index (RIC: LP63511336) were retrieved from Refinitiv for the period 1 January 2024 to 31 December 2024 (Task D: Basement date is 31st December 2024To establish a consistent price series for all instruments, a daily mid-price (Pt) was computed as the arithmetic mean of the bid and ask prices:

$$P_{\mathrm{Mid,t}} = \frac{\mathrm{P_{Bid,t}} + \mathrm{P_{Ask,t}}}{2}$$

To ensure temporal consistency, the data was cleaned by removing any dates with missing price observations for any security. The resulting aligned price matrix is shown in excerpt in Table_A2.

Daily logarithmic returns ($\mathrm{r_t}$) were then calculated for each security and the benchmark using the formula:

$$r_t = \ln(\frac{P_t}{P_{t-1}})$$

Portfolio returns ($r_{p,t}$) were computed as the weighted average of the individual bond returns using the specified initial weights. The tracking error (TE) was defined as the standard deviation of the daily active returns ($r_{p,t} - r_{b,t}$), and annualised by the standard convention of multiplying by the $\sqrt{252}$.

2A.3 Results and Interpretation

The analysis reveals a significant deviation between the portfolio's performance and that of the benchmark. As presented in Table_A3 , the portfolio recorded a daily tracking error of 49.83 basis points, which corresponds to an annualised tracking error of 791.09 basis points**.** This magnitude is substantially misaligned with institutional targets for index-aware strategies. According to the course materials, pure "vanilla" index tracking portfolios aim for a tracking error of 1-15 basis points, while enhanced indexing strategies, which allow for minor risk factor mismatches, accept a wider range of 15-50 basis points (RMIT University, 2025, Topic 5, Slide 6). The observed result of over 790 basis points, therefore, indicates that the portfolio is not merely an enhanced fund but functions as a high-risk active strategy, driven by major structural differences rather than minor tactical deviations from the benchmark.

2A.4 Visual Diagnostics

The dynamic relationship between the portfolio and the benchmark is further explored through visual analysis. Figure_A2 plots the cumulative value of a hypothetical $10,000 investment. While the series exhibit some co-movement, the portfolio demonstrates substantial and sustained deviations from the benchmark, particularly in the second half of the year. The shaded regions, denoting periods of outperformance and underperformance, confirm that this divergence is not transient but a persistent feature of the portfolio's behaviour.

The histogram of daily active returns, presented in Figure_A3, provides further insight. The distribution is centred near zero, indicating no systematic directional bias. However, its wide dispersion confirms a high level of day-to-day volatility relative to the benchmark. The frequent occurrence of daily tracking errors exceeding 100 basis points corroborates the high level of replication risk quantified in Table_A3 and is indicative of a failure to consistently track the index.

2B. Analysis of tracking error drivers and optimisation

The significant tracking error calculated in Section 2A is not an anomalous statistical outcome, but rather a direct and predictable consequence of the portfolio's fundamental structural deviations from its benchmark. This section deconstructs these deviations, validates their impact through correlation analysis, and presents an optimised weighting scheme to mitigate the tracking error using only the existing portfolio components, before discussing a superior strategy based on amending the portfolio's composition.

2B.1 Benchmark composition and structural mismatch

An analysis of the portfolio's objective begins with understanding the composition of the benchmark it seeks to track, the iShares Australian Bond Index. Data from the official issuer, BlackRock, reveals that the index is overwhelmingly dominated by sovereign debt, as detailed in Table_B1. When this sovereign-heavy composition is compared against the assigned portfolio's allocation (Figure_A1), a severe structural mismatch becomes evident. This is further illustrated in Figure_B1, which groups issuers into macro-categories. The benchmark is comprised of approximately 77% sovereign debt, whereas the portfolio allocates only 12% to this category. Instead, the portfolio is heavily concentrated in the "Major Bank" sector (72%), a category with negligible weight in the benchmark. Given this fundamental divergence, the portfolio cannot be expected to effectively track the benchmark.

2B.2 Root causes of performance deviation

The elevated tracking error is attributable to several structural mismatches between the portfolio and the broad-market bond index. Key contributing factors include:

- **Low Diversification**: The portfolio's composition of only six bonds magnifies the impact of security-specific price movements, creating a high level of idiosyncratic risk that is not present in the highly diversified benchmark.
- **Sector Overweight:** The significant allocation to corporate and bank issuers introduces a high sensitivity to credit spread volatility, a risk factor that is not proportionally represented in the sovereign-dominated benchmark.
- **Maturity and Duration Mismatch**: The presence of very long-dated bonds (maturing in 2047 and 2050) creates a distinct duration profile, leading to differential sensitivity to interest rate shifts compared to the benchmark.

In summary, while the portfolio's structure may be designed to pursue higher yields or capital gains, these characteristics fundamentally compromise its ability to track the designated benchmark index.

2B.3 Empirical validation via correlation analysis

The impact of these structural flaws is empirically validated by analysing the daily return correlations between the portfolio's components and the benchmark index, as shown in the Figure_B2 heatmap and Figure_B3 scatter plots. The analysis confirms the critical role of issuer type. The sole sovereign bond in the portfolio (AUGV_2030) exhibits a strong positive correlation of +0.91 with the benchmark, making it the most effective tracking component. In stark contrast, the two CBA bonds have a correlation of only +0.19, confirming their performance is largely disconnected from the benchmark's movements. This weak correlation is a direct statistical manifestation of the sector overweight and is a primary driver of the high tracking error.

2B.4 Portfolio re-weighting for tracking error minimisation

Despite the portfolio's structural deficiencies, its tracking performance can be improved by optimising its internal weights. A quantitative optimisation was performed to find the allocation for the six existing bonds that minimises the daily tracking error. The methodology involves solving a constrained optimisation problem, formulated as follows:

$$\min_{w} \sigma\left(R_p(w) - R_b\right) \text{ subject to } \sum_i w_i = 1 \text{ and } w_i \geq 0$$

where w is the vector of portfolio weights, $R_p(w)$ is the daily weighted portfolio return, and R_b is the daily benchmark return. The results, presented in Table_B2 and Table_B3, show that the optimised allocation dramatically shifts capital towards the bond with the highest benchmark correlation. The weight of the AUGV_2030 bond is increased from 12.0% to 46.3%, while the allocation to the poorly correlated CBA bonds is reduced to a minimal 1.5% each. This strategic re-weighting successfully reduces the annualised tracking error from 791 bps to a much lower 186 bps. The practical impact of this optimisation is visually confirmed in Figure_B4, where the optimised portfolio's performance line tracks the benchmark far more closely than the original.

2B.5 A superior strategy: amending portfolio composition

While re-weighting the existing components is effective, a more fundamental strategy involves modifying the portfolio's composition by utilising the full universe of available securities. This approach addresses the root causes of the tracking error. Based on the data, this strategy would prioritise:

- Increasing sovereign exposure: To correct the severe underweighting, the portfolio's allocation to government bonds (available in the list under codes 41-61) should be drastically increased to align with the benchmark's ~77% exposure.
- Reducing Corporate Exposure: The significant overweight position in bank-issued bonds should be unwound to better match the benchmark's credit risk profile.

In summary, constructing a new, more diversified portfolio that mirrors the benchmark's key characteristics is the most effective approach to achieve a low tracking error. A full quantitative implementation of this superior strategy is not presented here due to space considerations. Therefore, this analysis has been integrated with the immunisation task in Section 2D, where a single optimal portfolio is constructed to simultaneously satisfy the duration-matching requirement and the objective of minimising tracking error against the benchmark.

2C. Critical evaluation of the tracking error method

The tracking error (TE) is a cornerstone metric in portfolio management, used to quantify the consistency of a portfolio's performance relative to its benchmark by measuring the volatility of active returns. While its utility is widely acknowledged, a critical evaluation reveals significant limitations. This section evaluates the strengths and weaknesses of the TE methodology, connecting the theoretical framework directly to the practical findings of this report.

2C.1 Strengths in Practice

The analysis performed in the preceding sections demonstrated two of the primary strengths of the tracking error methodology.

First, TE provides a clear and unambiguous quantification of risk relative to a benchmark. In the initial analysis in Section 2A, the calculated annualised TE of 791.09 basis points immediately signaled a severe structural misalignment between the portfolio and the iShares Australian Bond Index. This single figure effectively captured the significant performance deviations observed in Figure_A2 and served as a catalyst for a deeper investigation into the portfolio's structural flaws.

Second, TE serves as a powerful and practical tool for portfolio optimisation. As theorised by Roll (1992), portfolios can be constructed to minimise TE for a given level of active return. This was demonstrated in Section 2B.4, where a quantitative optimisation, using TE as the objective function, systematically re-weighted the portfolio. The successful reduction of the annualised TE from 791 bps to 186 bps is a practical application of this principle, highlighting TE's strength not just as a diagnostic metric, but as an actionable tool for risk management.

2C.2 Limitations observed in the case

Despite its utility, the analysis also exposed several of the method's critical limitations.

First, TE is inherently backward-looking and has limited predictive power. The optimisation that reduced the portfolio's TE was performed ex-post, using a historical dataset. As argued by authors such as Grinold and Kahn (2000), financial markets are non-stationary, and relying on historical data is akin to " like driving a car looking in the rear-view mirror" (diBartolomeo, 2010). There is no guarantee that the optimised weights, derived from past correlations, will remain effective in the future.

Second, the symmetric nature of TE fails to distinguish between "good" and "bad" volatility. The metric penalises large positive deviations (outperformance) just as it does large negative ones. The performance chart in Figure_A2 showed periods where the original portfolio significantly outperformed the benchmark. A manager strictly constrained by a low TE target might be forced to liquidate such outperforming positions, potentially sacrificing valuable alpha simply to reduce "risk" that investors would have welcomed. (Note the overperformance in Figure_A2, mainly driven by the index's overweight in banking stocks. However, it effectively highlights a potential issue with this type of analysis) This highlights a key flaw, which alternative measures like the Sortino Ratio, focused only on downside deviation, aim to correct (Sortino and van der Meer, 1991).

Third, the TE methodology overlooks practical constraints, especially in fixed-income markets. As highlighted by Fabozzi (2021), broad bond benchmarks are difficult and costly to replicate due to the illiquidity of many constituent bonds. The analysis in Section 2B.5 acknowledged this, concluding that a superior strategy involved amending the portfolio's composition. The original portfolio's high TE was, in part, a direct result of this practical constraint; a small six-bond portfolio cannot realistically replicate a broad, diversified index without incurring significant idiosyncratic risk (Vanguard, 2021).

2C.3 Conclusion

In its application to this portfolio, tracking error proved to be an indispensable diagnostic tool. It correctly identified a significant performance divergence and provided a framework for a quantitative solution that demonstrably improved benchmark tracking. However, its limitations were equally apparent. Its reliance on historical data, its indifference to the direction of returns, and its abstraction from real-world market frictions mean that TE cannot be used in isolation. Effective portfolio management requires that this quantitative metric be supplemented with qualitative analysis of structural misalignments and a forward-looking view of risk, confirming that TE is a valuable servant but a poor master.

2D. Immunisation of a 6-year liability

This section assesses the suitability of the assigned portfolio for immunising a single liability due in six years, as of the 31st December 2024 basement date. The analysis begins by evaluating the initial portfolio's duration, then details the construction of a superior, optimised immunisation portfolio, and concludes with a critical assessment of the underlying strategies.

2D.1 Initial portfolio assessment and constrained re-weighting

The first step in assessing the portfolio's suitability for immunisation is to calculate its Macaulay Duration. The duration for each of the six bonds was calculated individually using a precise methodology that accounts for partial periods, with the detailed results shown in Table_D1. The individual durations range significantly, from 1.51 years for the short-dated Macquarie bond to over 13.7 years for the long-dated Commonwealth Bank bonds.

The weighted average of these values gives a total portfolio Macaulay Duration of 8.7115 years. As summarised in Table_D2, this creates a significant duration mismatch of +2.7115 years against the 6-year liability, rendering the portfolio unsuitable for immunisation in its current state. The portfolio is over-hedged, meaning it is overly sensitive to interest rate changes relative to the liability, an issue visualized in Figure_D1.

To address this using only the existing components, an optimisation was performed to find the set of weights that achieves the 6-year duration target while minimising the deviation from the original allocation. The

resulting adjusted weights, presented in Table_D3, confirm that a solution exists but requires a radical reallocation. The solution necessitates eliminating the portfolio's exposure to the long-dated Commonwealth Bank bonds and concentrating over 60% of its value into the shortest-duration asset (MQG 2026 MTN). While this new portfolio would be immunised from a duration perspective, such extreme concentration would cause it to deviate even further from the diversified benchmark index, likely leading to a significant increase in tracking error. This highlights the inherent conflict between achieving a specific liability-matching goal and a benchmark-tracking objective when constrained to an unsuitable set of assets.

2D.2 Constructing and comparing alternative immunised portfolios

Moving beyond the simple re-weighting of the initial assets, this section explores the construction of superior immunised portfolios by utilising the full universe of available securities. To facilitate this advanced analysis, historical price and yield data for all available bonds and the benchmark index were sourced from Refinitiv, as detailed in the supplementary master data file. (Table_D_Data1 and Data2)

As discussed in Section 2C, different risk metrics can lead to vastly different portfolio outcomes. To investigates this, three distinct optimisation strategies were employed to construct portfolios that meet the primary 6-year duration constraint.

2D.2.1 Strategy 1: TE-Minimisation on a pre-selected candidate pool

The first approach is a two-stage heuristic designed for computational efficiency. To narrow the investment universe, a candidate pool of the 15 bonds with the highest historical correlation to the benchmark was first selected, as detailed in Table_D4. Subsequently, a constrained optimisation was run on this smaller pool to minimise tracking error. The resulting portfolio, shown in **Table_D5**, achieves the 6.0-year duration target with an annualised tracking error of 216.28 bps. The performance of this portfolio is visualised in Figure_D2.

2D.2.2 Strategy 2: TE-Minimisation on the full bond universe

The second strategy is a more direct and comprehensive approach. Here, the tracking-error minimisation was performed on the entire universe of available bonds, without any pre-selection. The optimiser was free to choose any combination of assets to find the most efficient solution. The resulting portfolio, detailed in Table_D6, also meets the 6.0-year duration target but achieves a significantly lower annualised tracking error of only 157.27 bps, representing a near-perfect replication of the benchmark from an immunisation perspective. (Figure_D3)

2D.2.3 Strategy 3: Sortino-ratio maximisation

As a direct response to the limitations of tracking error discussed in Section 2C.2, the third portfolio was constructed using an alternative objective function: maximising the Sortino ratio. This metric evaluates returns against downside volatility only, allowing the portfolio to capture upside potential without penalty. The optimisation was run on the full bond universe with the same duration and diversification constraints. The composition of this portfolio is shown in Table_D7, and its performance is plotted in Figure_D4.

2D.2.4 Comparative analysis

A comparative analysis of the three optimised portfolios, visually represented in Figure_D2, Figure_D3, and Figure_D4, reveals the distinct trade-offs inherent in each construction methodology.

The first strategy, minimising tracking error on a pre-selected pool of highly correlated candidates (Figure_D2), proves to be a double-edged sword. While it effectively reduces tracking error, the bias towards high-correlation assets results in a portfolio composed almost entirely of government bonds. This mimics the benchmark's largest component but sacrifices diversification, leading to underperformance relative to the index. The second strategy, minimising tracking error over the entire bond universe (Figure_D3), yields the most successful outcome for pure benchmark replication. This approach creates a portfolio whose composition closely mirrors the benchmark. Finally, the Sortino-ratio optimisation (Figure_D4) demonstrates a fundamentally different objective. By ignoring upside volatility, this strategy constructs a portfolio that successfully generates periods of significant outperformance. This comes at the explicit cost of higher tracking error, as the portfolio's composition (with a greater allocation to corporate bonds) is designed to deviate from the benchmark in pursuit of alpha.

2D.3 Critical assessment of the duration-matching approach

Duration-matching is a foundational immunisation technique in fixed-income management, but its practical application reveals a trade-off between its flexibility and the limitations imposed by its underlying theoretical assumptions.

Strengths in practice:

The primary strength of duration-matching is its operational flexibility. Unlike more rigid strategies, it does not require a perfect alignment of individual cash flows, allowing managers to construct immunised portfolios from a broad and diverse universe of bonds (Fabozzi, 2021). This was a key advantage in our analysis. The duration-matching framework was robust enough to be incorporated as a primary constraint within complex, multi-objective optimisation models. This enabled the construction of sophisticated portfolios that could simultaneously target a 6-year duration for liability hedging while also optimising for a secondary goal, such as minimising tracking error or maximising the Sortino ratio. This demonstrates its power not just as a standalone immunisation tool, but as a flexible component in modern portfolio construction.

Limitations in practice:

Despite its utility, the strategy's effectiveness is constrained by key assumptions that were evident in our case.

- **Exposure to non-parallel yield curve shifts:** The core weakness of duration-matching is its assumption that interest rates shift in a parallel manner across the entire yield curve. This assumption rarely holds in reality, as yield curves can twist, steepen, or flatten, which can break an immunisation hedge (Reitano, 1992). Although our optimal portfolio is perfectly matched with a duration of 6.0 years, its cash flows are dispersed over time. It is therefore still vulnerable to non-parallel shifts; a "flattening twist," for instance, where short-term rates rise more than long-term rates, would affect the value of the portfolio's different bonds in complex ways not captured by the single duration number, potentially re-opening a funding gap.
- **Linear approximation and convexity risk:** Duration is a linear, first-order approximation of a bond's price sensitivity and ignores the natural curvature (convexity) of the price-yield relationship. While this approximation is effective for small changes in yield, its error becomes significant during large interest rate shocks. A more robust immunisation strategy, as outlined by Redington (1952), requires not only matching the duration of assets and liabilities but also ensuring that the convexity of the asset portfolio is greater than that of the liabilities. Our optimisation did not include this second-order condition, leaving the portfolio exposed to convexity risk.

Model risk: The entire framework rests on simplifying assumptions that may not hold true. It assumes bonds are default-free and that their cash flows are certain. It also overlooks the fact that a portfolio's duration is not static; it changes with the passage of time ("duration drift") and with changes in interest rates, necessitating periodic and costly rebalancing to maintain the hedge.

2D.4 Alternative strategy: cash-flow matching

An alternative, more conservative immunisation strategy is cash-flow matching, also known as creating a "dedicated portfolio". This approach seeks to align the exact timing and magnitude of asset cash flows with the expected liability, thereby eliminating interest rate risk in its entirety (Fabozzi, 2021).

Implementation framework:

To implement this for the single liability due on 31 December 2030, the first step would be to screen the available bond list for instruments maturing on or just before this date. The ideal instrument would be a default-free, zero-coupon bond maturing on the exact liability date, as this would eliminate both price and reinvestment risk. Since no such instrument exists in our universe, the next step is to find the closest proxy. The AUGV 1.000 21-DEC-2030 bond is the best available candidate. (valuation at 31/12/2024) A manager would purchase a principal amount of this bond such that its final cash flow (principal plus final coupon) equals the liability amount.

Practical challenges and limitations:

This strategy, while theoretically perfect, presents significant practical challenges in our case.

- **Absence of perfect instruments:** The primary challenge is the lack of a bond that matures on the exact liability date. Using the AUGV 1.000 21-DEC-2030 bond means the proceeds would be received 10 days early. This reintroduces a small but non-zero reinvestment risk, as the funds must be held at an unknown short-term rate for those 10 days, slightly undermining the core purpose of the strategy.
- **Higher cost and inflexibility:** Cash-flow matching can be more expensive. Bonds with very specific and desirable maturity dates may trade at a "scarcity premium" (Fabozzi, 2021). Furthermore, the resulting portfolio is extremely rigid. Once constructed, it cannot be easily rebalanced to capture market opportunities without destroying the cash-flow match, making it unsuitable for anything other than a pure hedging mandate.
- **Reinvestment of interim coupons:** If multiple coupon bonds were used to construct a matching portfolio, the interim coupon payments received before the liability date would need to be reinvested at uncertain future rates. This "cash drag" re-introduces reinvestment risk and can lower the portfolio's overall return, making it more expensive to fund the initial liability.

Given these constraints, duration-matching remains the more practical and adaptable strategy for this specific asset universe.

2E. Credit quality analysis

This section evaluates the credit quality of the assigned bond portfolio. It commences with a detailed financial ratio analysis of the corporate issuers, differentiating between financial institutions and industrial corporations to reflect their distinct operating and financial structures. Subsequently, the overall portfolio credit quality is assessed, considering risk concentration and the influence of individual securities. The analysis then explores alternative credit risk indicators and concludes with a critical discussion of the advantages and limitations of ratio analysis as experienced in this portfolio review.

2E.1 Ratio analysis of corporate issuers

A differentiated analytical framework is essential for a meaningful assessment of credit risk, as the key financial drivers vary significantly between sectors. The following analysis adheres to this principle by assessing financial institutions and the industrial corporation separately, based on the data presented in Table_E2, Table_E3, and Table_E4.

2E.1.1 Financial institutions: Commonwealth Bank (CBA) and Macquarie Group (MQG)

The creditworthiness of banking institutions is critically dependent on their capital adequacy, asset quality, profitability, and liquidity.

Capital adequacy: Both institutions maintain robust capital ratios, comfortably exceeding regulatory minimums. CBA's Core Tier 1 (CET1) ratio improved slightly to 12.2% in FY2024, suggesting a strong capacity to absorb losses. MQG's CET1 ratio, while declining to 12.8%, remains at a very strong absolute level. For bondholders, both banks demonstrate a high degree of solvency.

Asset quality: The asset quality trends are divergent. MQG showed an improving NPL ratio (1.0%), though this was coupled with a significant increase in provisions for future losses, indicating a prudent, forward-looking stance. Conversely, CBA exhibited a rise in non-performing loans (to 0.8%) while simultaneously reducing its provisions. This combination could be a minor red flag, suggesting potential under-provisioning for emerging credit issues. But still the value is low.

Profitability & liquidity: CBA faces some profitability pressure, with its Return on Average Common Equity (ROACE) declining to 13.1%. More notably, its net cash flow from operations worsened significantly. In contrast, MQG's ROACE improved to 10.4%, and it achieved a positive turnaround in operating cash flow, strengthening its liquidity profile.

Overall, both banks remain highly creditworthy, but MQG appears to be more proactively managing potential risks and demonstrates a stronger cash generation trend in the most recent fiscal year.

2E.1.2 Industrial corporation: Worley Ltd

For an industrial company such as Worley, credit analysis focuses on measures of leverage, profitability and its ability to cover interest expenses, and cash flow generation. All financial data is referenced from Table_E4.

Leverage & Capital Structure: Worley Ltd showed a clear and improving leverage profile. Its Total Debt as a percentage of Total Capital decreased from 28.6% to 27.4%, and its Total Debt to Equity ratio followed a similar positive trend, declining from 40.1% to 37.7%. This consistent de-leveraging is a strong positive signal for creditworthiness, as it implies a reduced burden from debt servicing obligations and a larger equity cushion to absorb potential losses.

Profitability & Coverage: The company's ability to service its debt from earnings demonstrated a clear improvement. The Interest Coverage Ratio (ICR) strengthened from 4.45x to 4.75x. This indicates that the company's operating profit now covers its interest expense by a larger and more comfortable margin, reducing risk for debtholders. This enhanced coverage is consistent with the expanding EBITDA Margin (from 6.8% to 7.0%), painting a consistent picture of improving operational profitability and efficiency.

Cash Flow & Liquidity: Worley demonstrated a significant strengthening in its cash flow generation. Net Cash Flow from Operating Activities increased substantially from AUD 260 million to AUD 682 million. More importantly, Free Cash Flow (FCF), a key indicator of a firm's ability to repay debt, saw robust growth from AUD 178 million to AUD 587 million. This powerful improvement in dynamic cash flow generation is a significant credit positive that far outweighs the minor decline in the static Current Ratio (from 1.3x to 1.2x), confirming Worley's strong capacity to manage its obligations.

2E.2 Overall portfolio credit quality assessment

The portfolio is predominantly investment-grade, with issuer credit ratings ranging from 'A+' (or its 'a1' equivalent) for the corporate issuers up to 'AAA' for the sovereign issuer, as shown in Table_E1. This composition suggests a high overall credit quality.

However, the portfolio's primary weakness is its substantial concentration risk. Bonds issued by the two financial institutions, CBA and MQG, collectively account for 59% of the total portfolio value. This heavy weighting exposes the portfolio disproportionately to systemic risks affecting the Australian banking sector, such as regulatory changes or a downturn in the domestic property market.

The Australian Government bond acts as a high-quality anchor, significantly lowering the portfolio's aggregate credit risk with its 'AAA' rating. Conversely, the long-dated bonds from CBA (maturing in 2047 and 2050) introduce substantial duration risk, making their market prices highly sensitive to interest rate changes, a risk distinct from but correlated with credit perceptions.

2E.3 Alternative credit risk indicators

While ratio analysis is foundational, its backward-looking nature invites the use of supplementary models.

- **The Altman Z-Score:** A highly effective alternative would be the Altman Z-score, a multivariate model designed to predict the probability of corporate bankruptcy (Altman, 1968). For an industrial firm like Worley, the Z-score would consolidate multiple ratios (liquidity, profitability, leverage, etc.) into a single, probabilistic measure of default risk. This could have provided a more holistic view, for example, contextualising the minor decline in Worley's ICR within its overall strong financial position. It is important to note that the classic Z-score model is not appropriate for financial institutions like CBA and MQG due to their unique balance sheet structures.

- **Market-Based measures:** Forward-looking credit risk can be gauged using market-based indicators. The Z-Spreads provided in Table_E1 are an example. The spread of 291.97 bps on one CBA bond versus 70.11 bps on an MQG bond suggests the market perceives a higher risk for that specific long-dated CBA instrument, a nuance not captured by agency ratings alone.

2E.4 Critical discussion of ratio analysis in practice

The application of ratio analysis to this portfolio highlighted both its strengths and limitations.

- **Advantages:** The primary strength was providing a **structured framework** for a direct financial comparison. Using industry-specific metrics for CBA and MQG revealed nuanced differences in their capital and liquidity management that a generic analysis would have missed.

- **Limitations:** Several limitations became apparent. First, the method is **inapplicable to the sovereign issuer**, whose creditworthiness depends on macroeconomic factors, not corporate financial statements. Second, the analysis is inherently **backward-looking**, based on FY2024 data that does not capture subsequent events or future performance. Third, the ratios do not explain the **underlying causes** of the observed trends (e.g., *why* CBA's operating cash flow declined). A full assessment requires further qualitative investigation into management strategy and industry dynamics, as supported by Fabozzi (2021).

In conclusion, ratio analysis served as an essential starting point, but a robust credit assessment requires supplementing it with forward-looking market indicators and deep qualitative judgment.

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Ethical Note on AI Use

Artificial Intelligence tools were used in an active and constructive manner to assist with data organisation, macro creation, source discovery, and document structuring. These tools were employed not as a substitute for research, but as advanced support systems to enhance critical analysis and improve methodological rigor.

Table of figures:

Table_A1 – Assigned Portfolio Composition
Summary of the six bonds including issuer, bond name, weight, coupon, and maturity.

Bond Code	Issuer	Bond Name	Weight	Coupon (%)	Maturity Date	Maturity Year
10	Commonwealth Bank	CBA 3.300 26-AUG-2050	0.22	3.300	2050-08-26	2050
11	Macquarie Group	MQG 4.250 28-JUL-2026 MTN	0.09	4.250	2026-07-28	2026
37	Worley Financial Services PTY LTD	WORX 5.950 13-OCT-2028 '28 MTN	0.16	5.950	2028-10-13	2028
50	Australian Gov Bond	AUGV 2.500 21-MAY-2030	0.12	2.500	2030-05-21	2030
12	Macquarie Group	MQG 3.100 27-JAN-2032 MTN	0.16	3.100	2032-01-27	2032
9	Commonwealth Bank	CBA 4.485 11-OCT-2047	0.25	4.485	2047-10-11	2047

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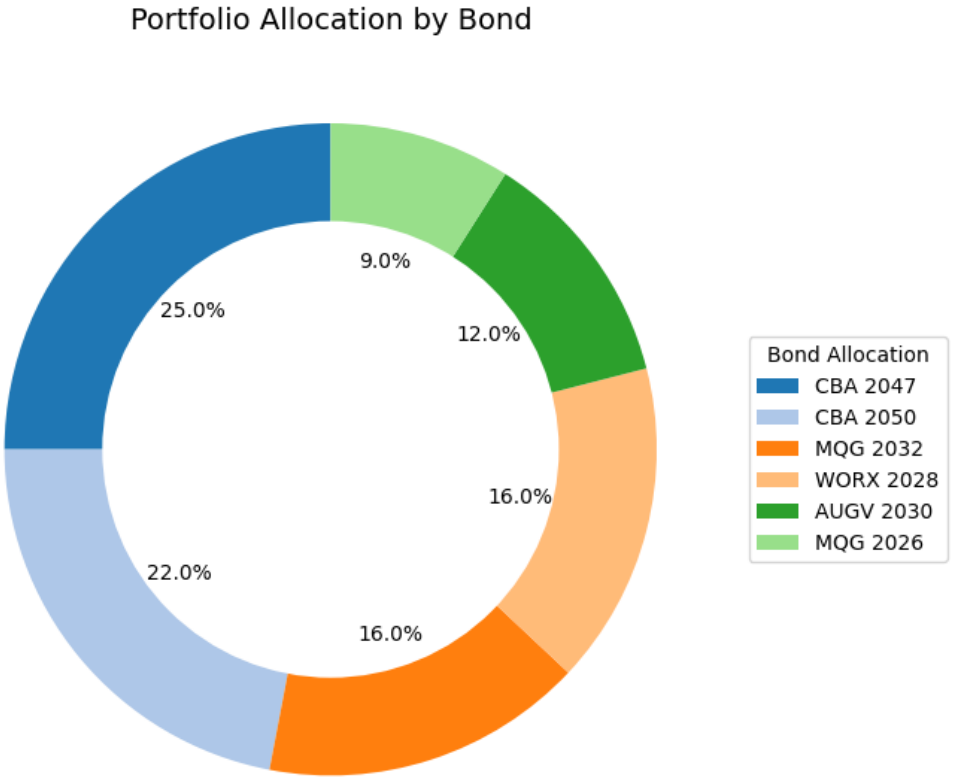
Figure_A1 – Portfolio Allocation by Bond
Donut chart showing each bond's proportional weight in the portfolio.



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Table_A2 – Aligned Mid Price Time Series (Excerpt)
Cleaned and aligned mid-price data used for daily return calculation.

Date	10_CBA_2050_Mid	11_MQG_2026_Mid	37_WORX_2028_Mid	50_AUGV_2030_Mid	12_MQG_2032_Mid	9_CBA_2047_Mid	00_BENCHMARK_Mid
2024-01-02	54.1590	98.8020	101.4495	92.6655	85.2010	54.1590	0.930515
2024-01-03	54.3840	98.6755	101.3025	92.4825	85.1680	54.3840	0.927979
2024-01-04	54.2135	98.6550	101.4520	92.5555	84.6920	54.2135	0.927739
2024-01-05	53.7660	98.4960	101.0090	92.1515	84.3975	53.7660	0.924208
2024-01-08	54.6165	98.2985	100.8040	91.8570	84.4565	54.6165	0.922930

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Table_A3 – Tracking Error Estimates
Daily and annualised tracking error in decimal and basis points.

Metric	Value (Decimal)	Value (bps)
Daily Tracking Error	0.004983	49.83
Annualised Tracking Error	0.079109	791.09

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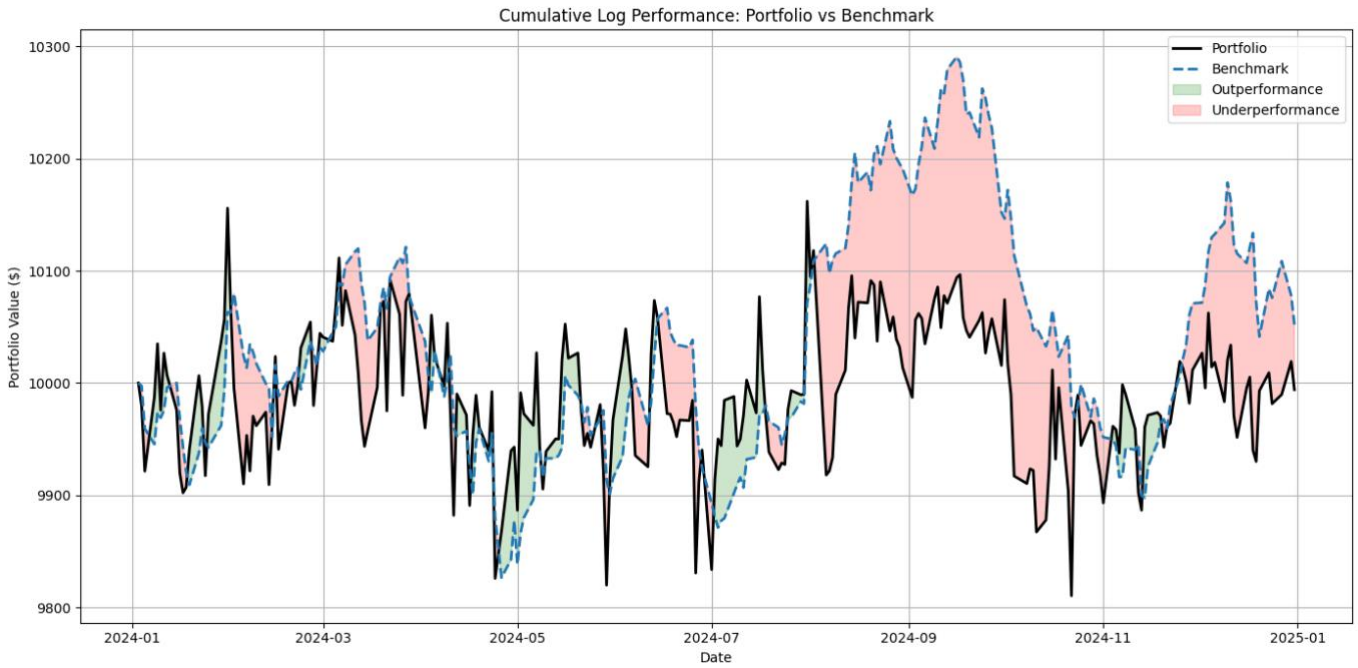
Figure_A2 – Cumulative Log Performance: Portfolio vs Benchmark
Cumulative value comparison from $10,000, highlighting relative performance.



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Figure_A3 – Distribution of Daily Tracking Error
Histogram of daily excess returns between portfolio and benchmark.

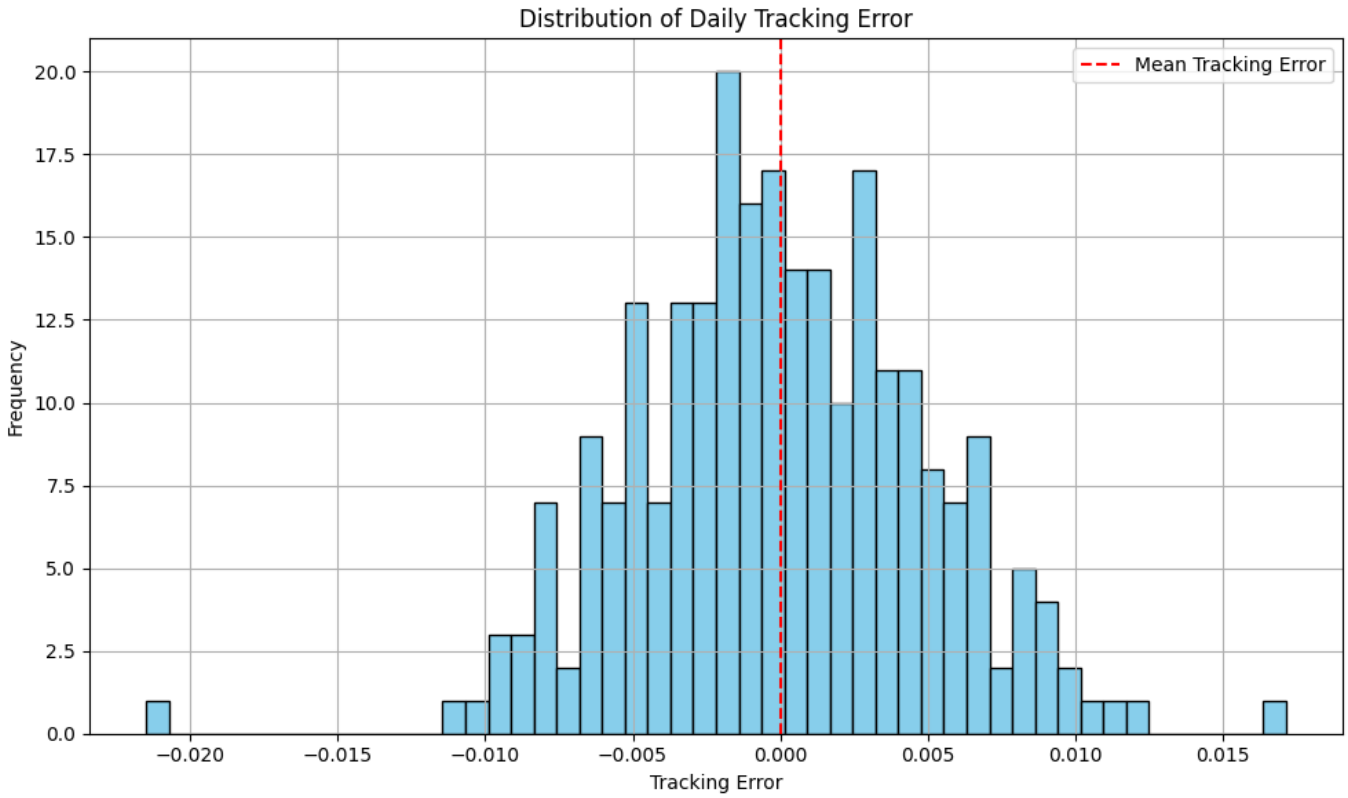

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Table B1: Top 10 Issuers in the iShares Australian Bond Index
Breakdown of the benchmark's largest holdings by issuer and weight (%), as per BlackRock data, used to establish its sovereign-heavy nature.

Name	Weight (%)	Name	Weight (%)
AUSTRALIA (COMMONWEALTH OF)	45.83	SOUTH AUSTRALIAN GOVERNMENT FINANCING AUTHORITY	1.87
TREASURY CORPORATION OF VICTORIA	9.66	EUROPEAN INVESTMENT BANK	1.06
NEW SOUTH WALES TREASURY CORPORATION	9.21	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT	0.97
QUEENSLAND TREASURY CORPORATION	7.25	ASIAN DEVELOPMENT BANK	0.85
WESTERN AUSTRALIAN TREASURY CORPORATION	2.27	AUSTRALIAN CAPITAL TERRITORY (GOVERNMENT OF)	0.82

Source: BlackRock, data retrieved for analysis.

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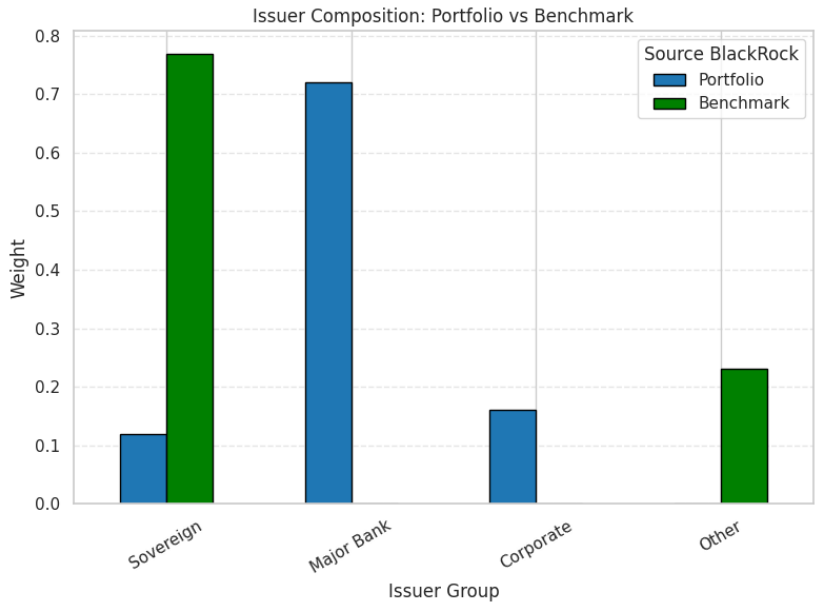
Figure_B1 – Issuer Composition: Portfolio vs Benchmark
Bar chart comparing the aggregated weight of the portfolio and benchmark across four issuer categories (Sovereign, Major Bank, Corporate, Other), highlighting the structural mismatch.



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Table_B2 – Original vs Optimised Portfolio Weights
Comparison of the initial portfolio weights against the new weights derived from the tracking error minimisation optimisation.

Bond	Original W	Optimised W
10_CBA_2050	0.220	0.015
11_MQG_2026	0.090	0.223
37_WORX_2028	0.160	0.285
50_AUGV_2030	0.120	0.463
12_MQG_2032	0.160	0.000
9_CBA_2047	0.250	0.015

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Table_B3 – Tracking Error Comparison: Original vs Optimised Portfolio
Summary of the daily and annualised tracking error before and after the weight optimisation, showing the quantitative improvement in basis points.

Metric	Value (Decimal)	Value (bps)
Original Daily TE	0.005	49.834
Original Annual TE	0.079	791.086
Optimised Daily TE	0.001	11.711
Optimised Annual TE	0.019	185.907

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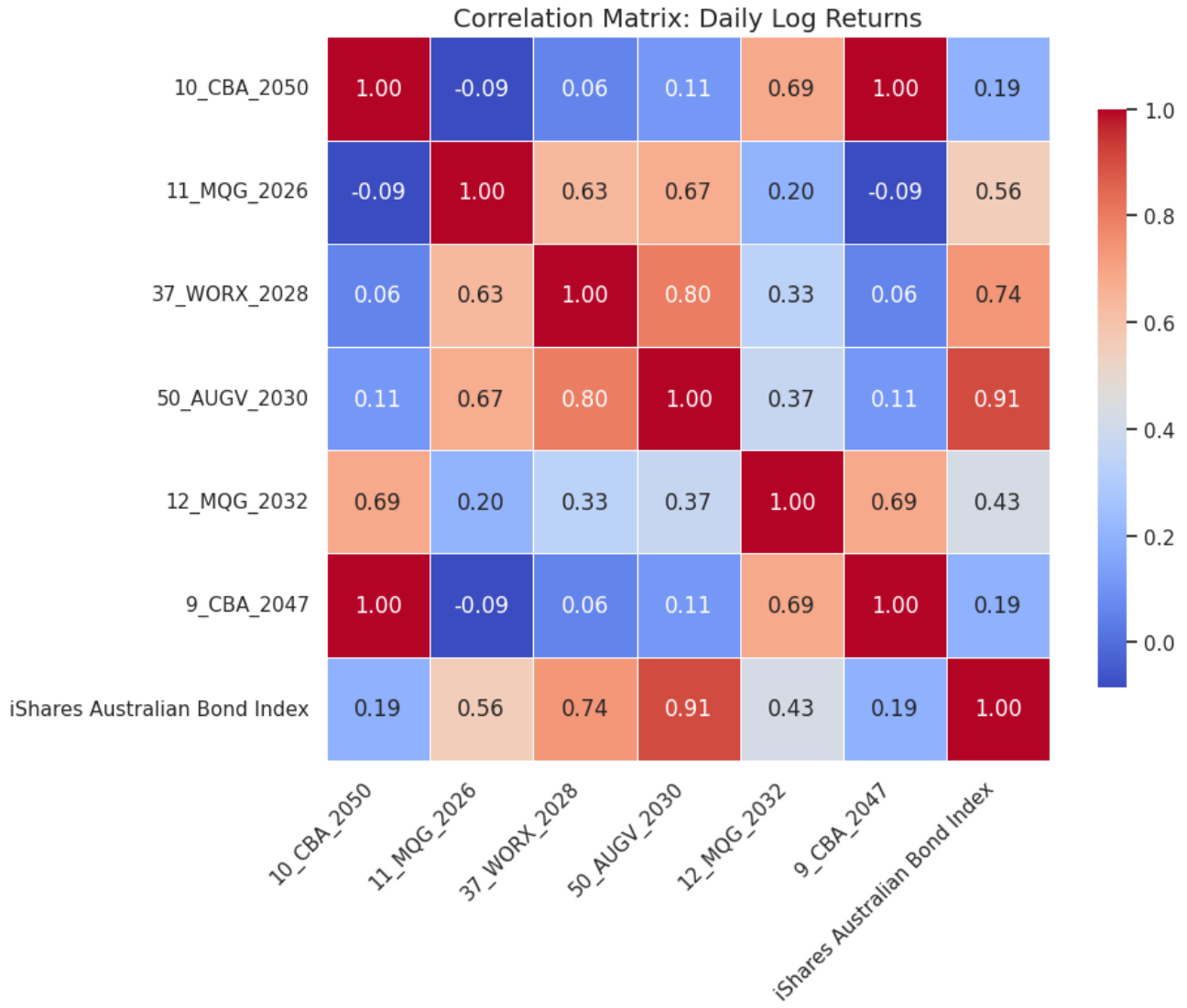
Figure_B2 – Correlation Matrix of Daily Log Returns
Heatmap displaying the pairwise correlation coefficients between the daily returns of the six portfolio bonds and the benchmark index.



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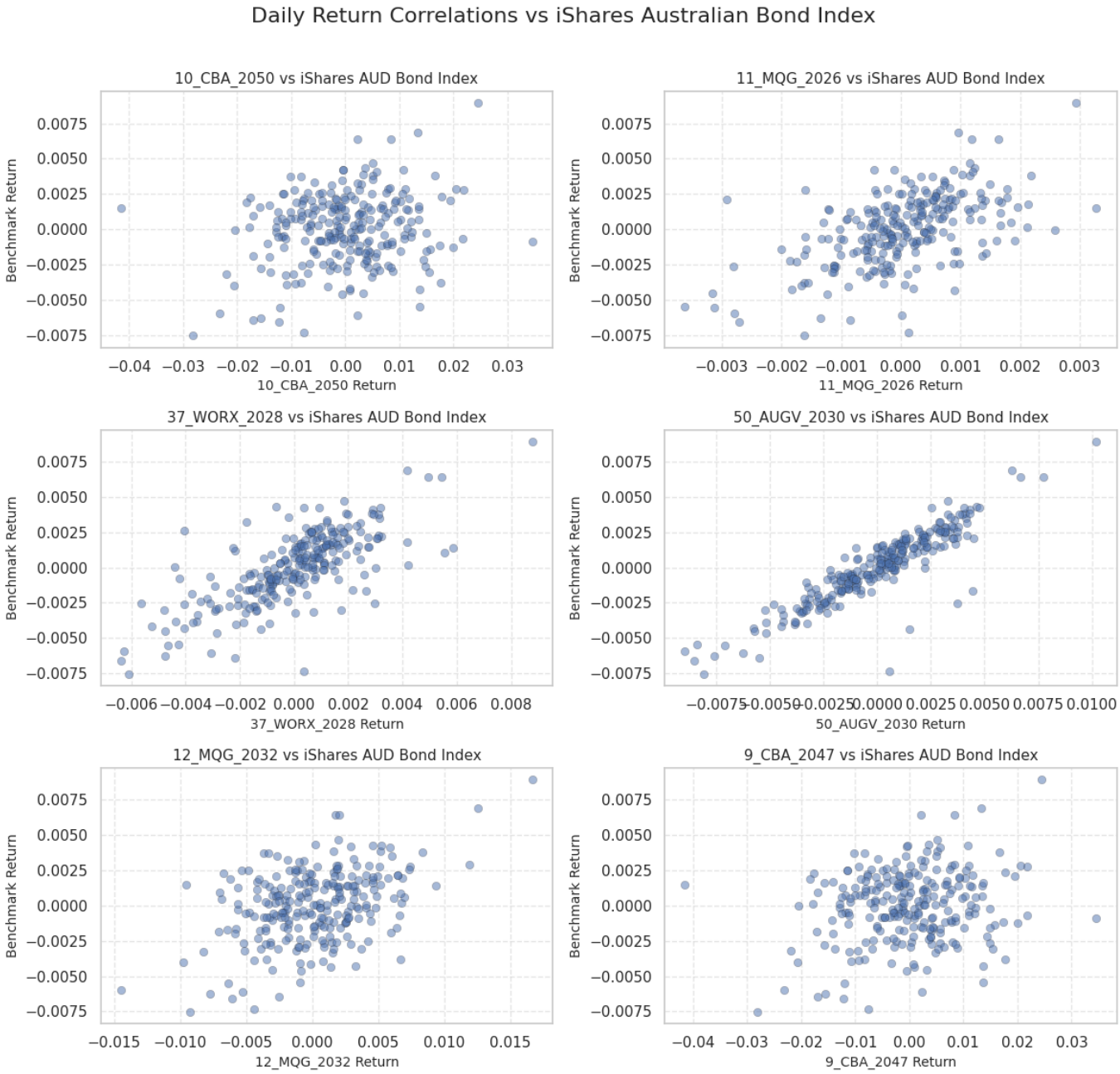
Figure_B3 – Scatter Plots of Daily Returns: Individual Bonds vs Benchmark
A 3x2 grid of scatter plots visually representing the correlation and return relationship of each portfolio component against the benchmark index.



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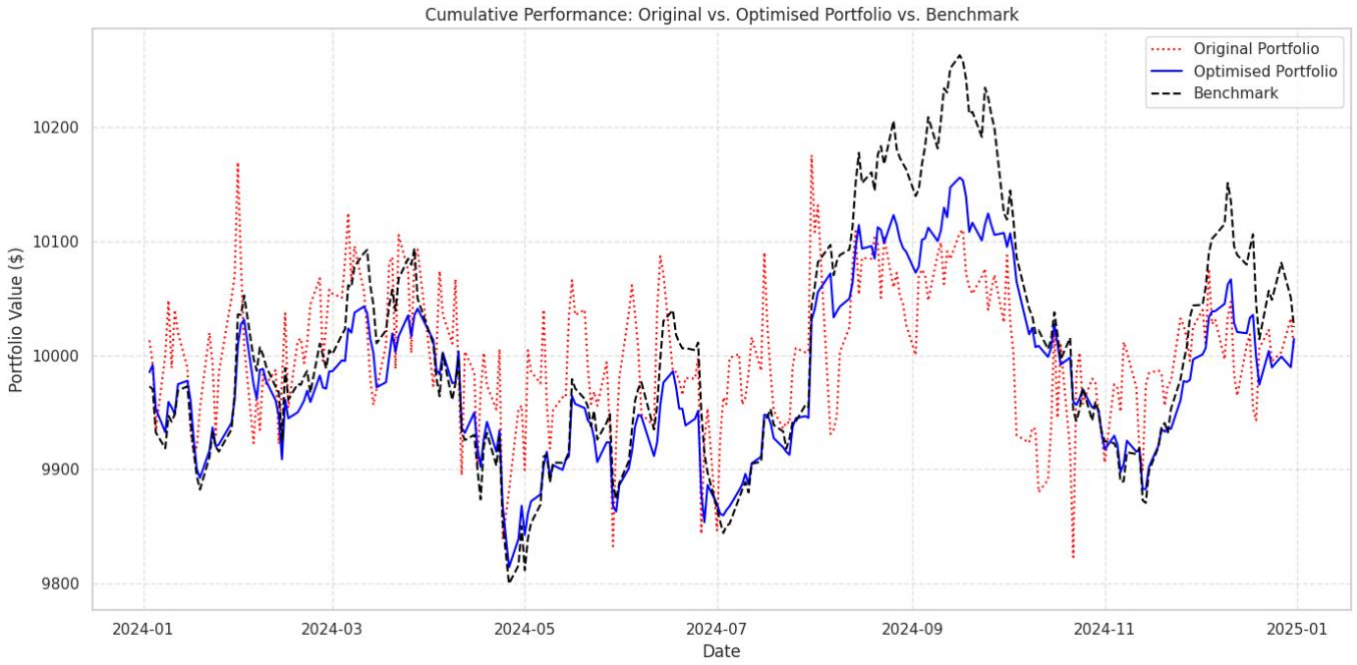
Figure_B4 – Cumulative Performance: Original vs. Optimised Portfolio vs. Benchmark
Line chart comparing the cumulative value growth from a $10,000 base for the three series. It visually demonstrates that the optimised portfolio's performance tracks the benchmark much more closely than the original portfolio, confirming the effectiveness of the re-weighting strategy.



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Table_D1 – Initial Portfolio Duration Calculation

A detailed breakdown of the Macaulay Duration calculation for each of the six bonds in the original portfolio as of 31-Dec-2024, showing each bond's individual duration and its contribution to the total portfolio duration.

Bond Name	Weight	Duration	Weighted Duration
MQG 4.250 28-JUL-2026 MTN	0.09	1.5143	0.1363
WORX 5.950 13-OCT-2028 '28 MTN	0.16	3.4039	0.5446
AUGV 2.500 21-MAY-2030	0.12	5.0465	0.6056
MQG 3.100 27-JAN-2032 MTN	0.16	6.2588	1.0014
CBA 4.485 11-OCT-2047	0.25	13.5603	3.3901
CBA 3.300 26-AUG-2050	0.22	13.7890	3.0336

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Table_D2 – Initial Duration Mismatch Summary

A summary table quantifying the initial portfolio's Macaulay Duration (8.7115 years) against the liability horizon (6.0 years), highlighting the significant duration mismatch of +2.7115 years.

Metric	Value (years)
Portfolio Macaulay Duration	8.7115
Liability Horizon	6.0000
Duration Mismatch (Gap)	2.7115

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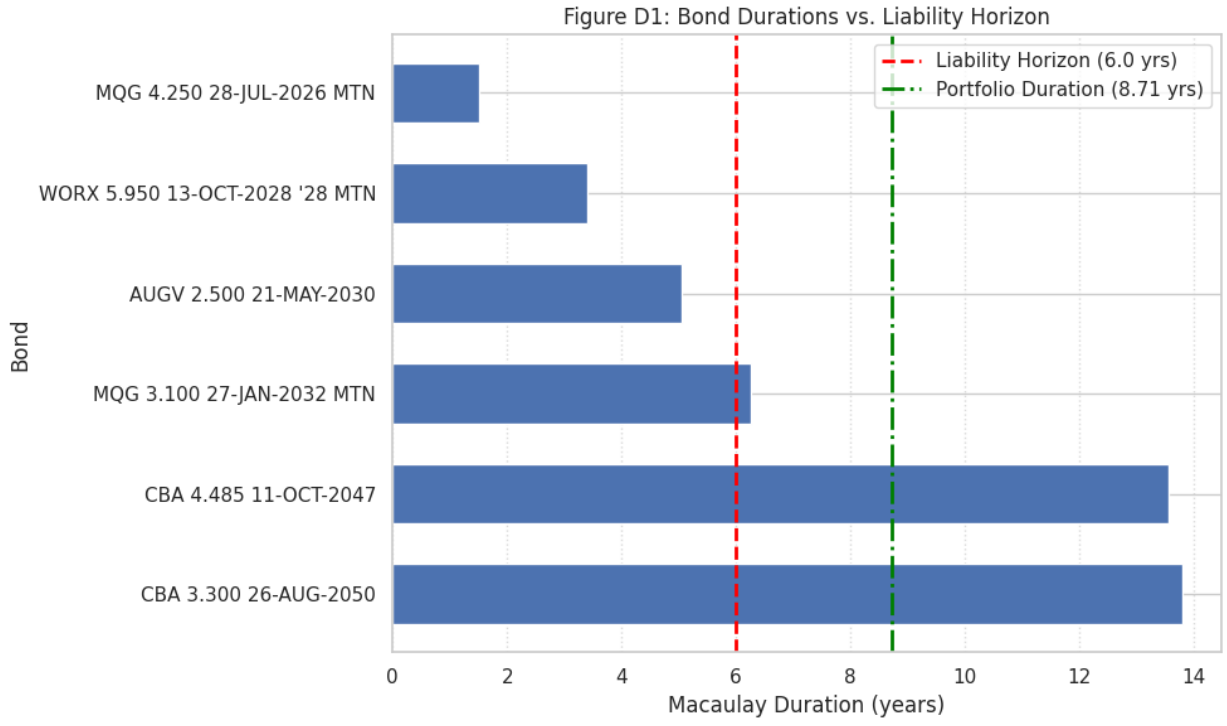
Figure_D1 – Initial Bond Durations vs. Liability Horizon

A horizontal bar chart visually comparing the Macaulay Duration of each of the six original bonds and the total portfolio against the 6-year liability horizon, illustrating the initial mismatch.



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Table_D3 – Adjusted Weights for Constrained Immunisation
Shows the optimised weights for the original six bonds required to achieve a 6-year portfolio duration. This demonstrates a re-allocation away from long-duration assets.

	Bond Name	Original Weight	Adjusted Weight
0	CBA 3.300 26-AUG-2050	0.22	0.0900
1	MQG 4.250 28-JUL-2026 MTN	0.09	0.2045
2	WORX 5.950 13-OCT-2028 '28 MTN	0.16	0.2369
3	AUGV 2.500 21-MAY-2030	0.12	0.1641
4	MQG 3.100 27-JAN-2032 MTN	0.16	0.1800
5	CBA 4.485 11-OCT-2047	0.25	0.1245

```
Verification: New Portfolio Duration = 6.0000 years
```

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Table_D4 – Top 15 Candidate Bonds by Benchmark Correlation
A shortlist of 15 bonds selected from the full universe based on having the highest historical correlation with the benchmark index. This pool serves as the input for the TE-minimisation optimisation.

Bond Name	Duration	Correlation
AUGV 1.500 21-JUN-2031	6.1598	0.9092
AUGV 1.250 21-MAY-2032	7.0265	0.9084
AUGV 1.000 21-DEC-2030	5.7919	0.9067
AUGV 1.000 21-NOV-2031	6.6355	0.9059
AUGV 2.500 21-MAY-2030	5.0465	0.9055
AUGV 3.750 21-APR-2037	9.7910	0.9028
AUGV 2.750 21-NOV-2029	4.5849	0.9028
AUGV 2.750 21-JUN-2035	9.0369	0.9019
AUGV 4.500 21-APR-2033	6.9737	0.9008
AUGV 3.250 21-APR-2029	4.0231	0.8976
AUGV 3.250 21-JUN-2039	11.3844	0.8965
AUGV 2.750 21-MAY-2041	12.7535	0.8929
AUGV 2.750 21-NOV-2028	3.6999	0.8923
AUGV 3.000 21-MAR-2047	15.1281	0.8911
AUGV 2.250 21-MAY-2028	3.2711	0.8893

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Table_D5 – Portfolio from TE-Minimisation on a Candidate Pool
The composition of the portfolio optimised to minimise tracking error when selecting from the pre-selected pool of 15 candidates.

	Bond Name	Optimal Weight	Duration
14	AUGV 2.250 21-MAY-2028	0.3500	3.2711
12	AUGV 2.750 21-NOV-2028	0.3016	3.6999
13	AUGV 3.000 21-MAR-2047	0.2105	15.1281
9	AUGV 3.250 21-APR-2029	0.1379	4.0231

```
Verification of Final Portfolio:
Number of bonds in portfolio: 4
Portfolio Duration: 6.0000 years
Annualised Tracking Error: 216.28 bps
```

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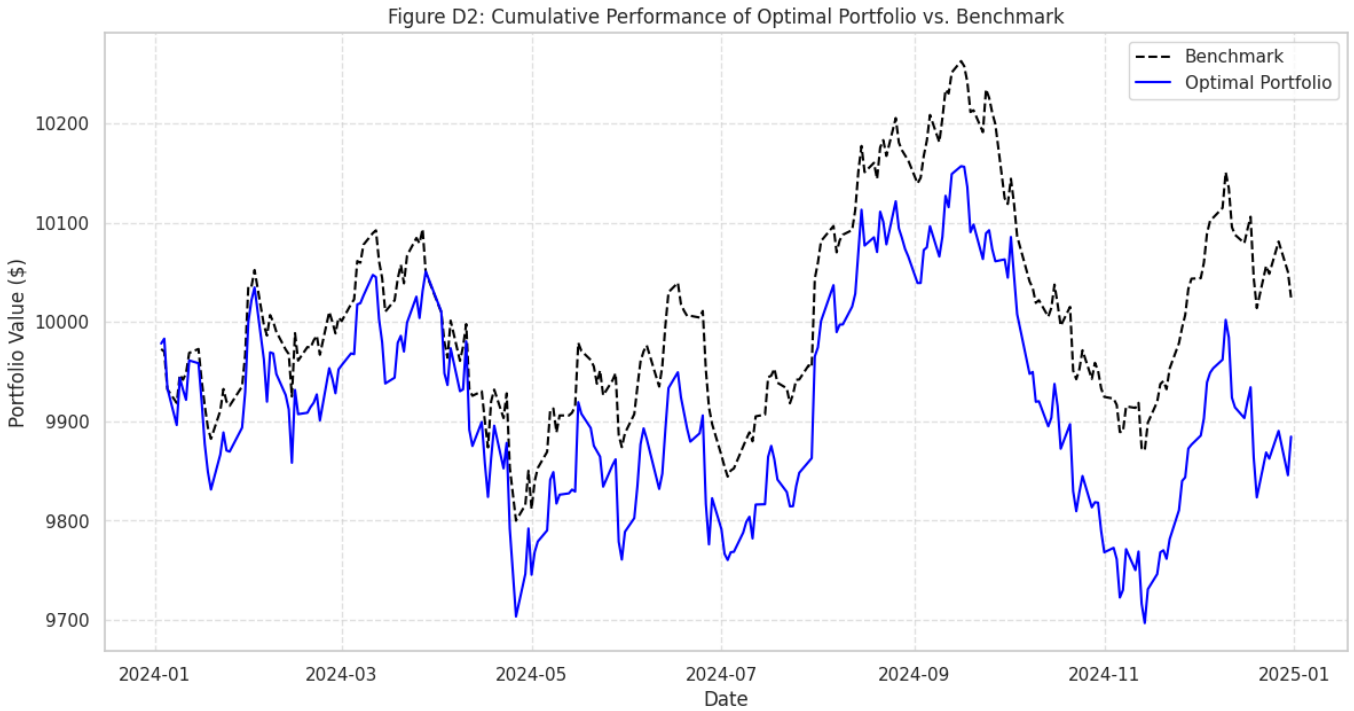
Figure_D2 – Cumulative Performance of TE-Optimised Portfolio (Candidate Pool)
A line chart comparing the performance of the portfolio constructed from the candidate pool against the benchmark.



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Table_D6 – Portfolio from TE-Minimisation on the Full Universe
The composition of the portfolio optimised to minimise tracking error when selecting from all available bonds.

	Bond Name	Optimal Weight	Duration
12	NAB 5.230 20-DEC-2031 FRN MTN	0.1951	5.9173
33	AUGV 0.250 21-NOV-2025	0.1267	0.8889
44	AUGV 1.250 21-MAY-2032	0.1239	7.0265
42	AUGV 1.500 21-JUN-2031	0.1186	6.1598
50	AUGV 3.000 21-MAR-2047	0.1153	15.1281
2	ANZ 5.070 31-JAN-2028 MTN	0.0636	2.8361

```
Verification:
  Portfolio Duration           = 6.0000 years
  Annualized Tracking Error    = 157.27 bps
```

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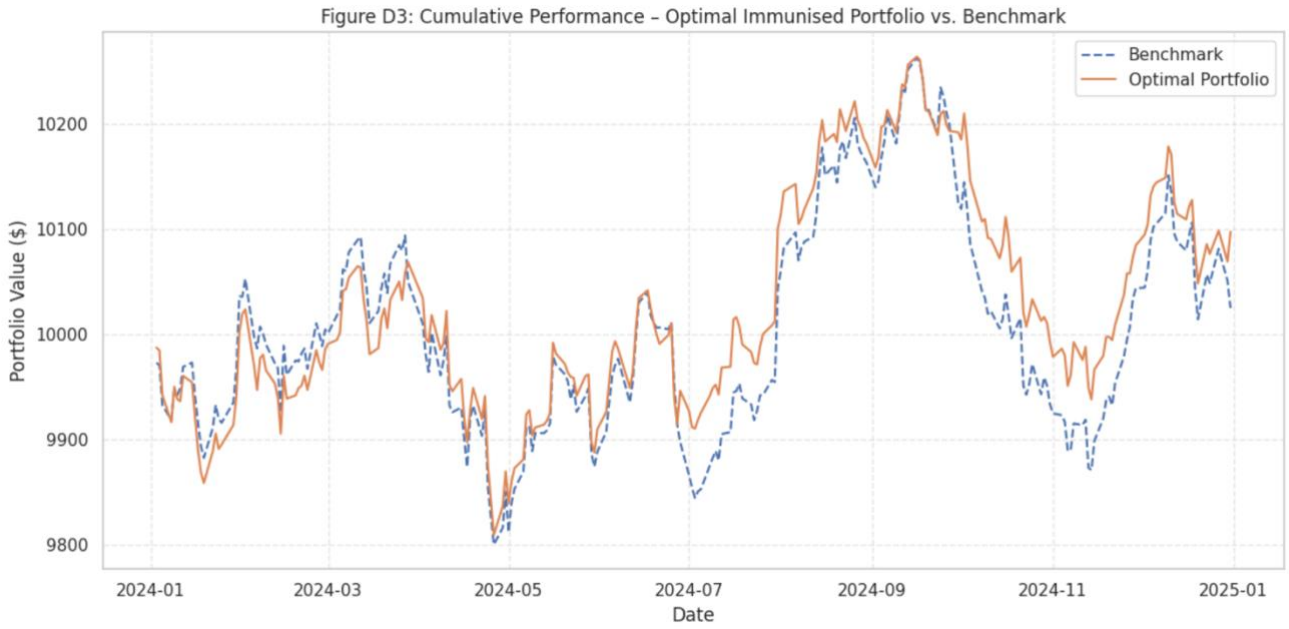
Figure_D2 – Cumulative Performance of TE-Optimised Portfolio (Full universe)
A line chart comparing the performance of the portfolio constructed from the candidate pool against the benchmark.



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Table_D7 – Portfolio from Sortino-Ratio Maximisation
The composition of the portfolio optimised to maximise the Sortino ratio, subject to a 6-year duration constraint.

	Bond Name	Optimal Weight	Duration
12	NAB 5.230 20-DEC-2031 FRN MTN	0.3500	5.9173
30	BOQ 1.400 06-MAY-2026 MTN	0.2779	1.3374
15	WBC 2.350 27-FEB-2040 MTN	0.1782	12.0566
27	GPTX 2.849 20-FEB-2032 '31 MTN	0.1500	6.3569
13	NAB 4.100 09-MAR-2038 MTN	0.0221	9.7682
4	ANZ 3.400 20-DEC-2039	0.0219	10.9612

```
Verification:
  Portfolio Duration = 6.0000 years
  Sortino Ratio      = 0.1296
```

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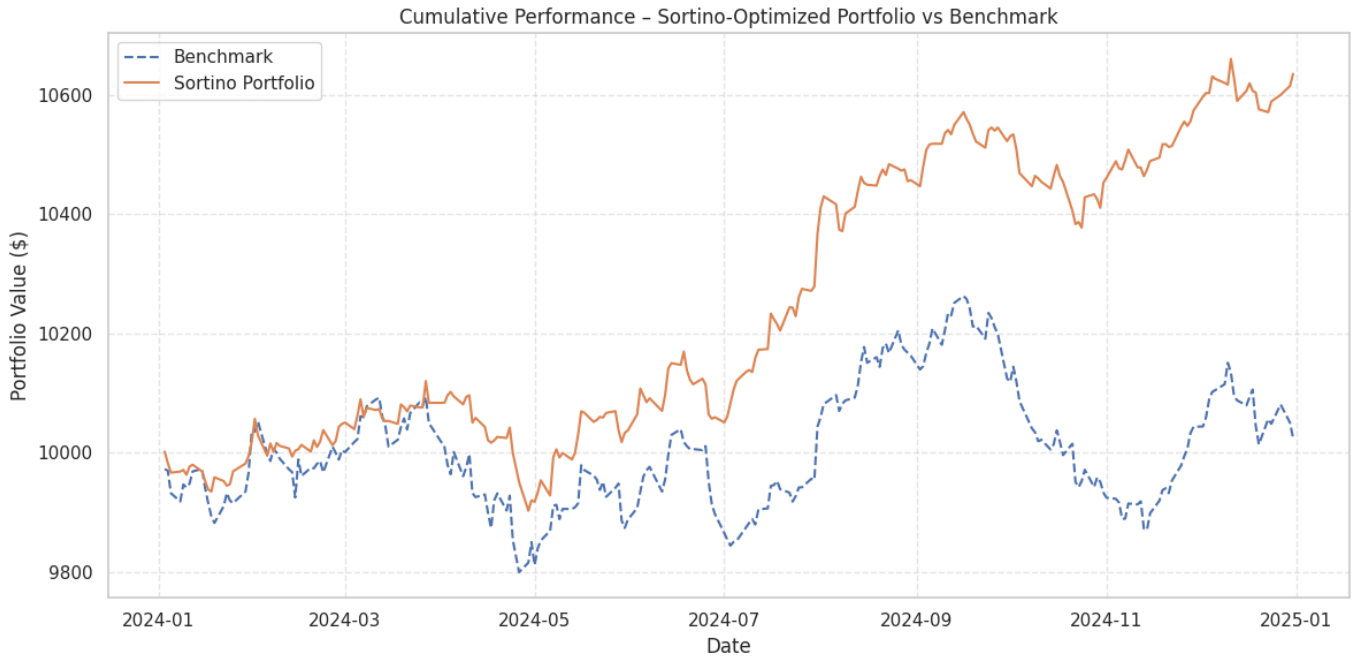
Figure_D4 – Cumulative Performance of Sortino-Optimised Portfolio
A line chart comparing the performance of the Sortino-optimised portfolio against the benchmark, illustrating its greater upside deviation.



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Table_D_Data1:

```
Total valid bonds for analysis: 61
```

	Bond Code	RIC/ISIN	Issuer	Bond Name	Coupon (%)	Maturity Date
0	1	AU3CB0235158	ANZ	ANZ 4.000 22-JUL-2026 MTN	4.000	2026-07-22
1	2	AU3CB0243525	ANZ	ANZ 4.100 28-SEP-2027 MTN	4.100	2027-09-28
2	3	XS0880275317	ANZ	ANZ 5.070 31-JAN-2028 MTN	5.070	2028-01-31
3	4	XS1785312395	ANZ	ANZ 4.045 28-FEB-2033 MTN	4.045	2033-02-28
4	5	XS2095795881	ANZ	ANZ 3.400 20-DEC-2039	3.400	2039-12-20
...	...	...	...	...	...	...
56	57	AUG03750437=	AUSTRALIAN GOVERNMENT BOND	AUGV 3.750 21-APR-2037	3.750	2037-04-21
57	58	AUG03250639=	AUSTRALIAN GOVERNMENT BOND	AUGV 3.250 21-JUN-2039	3.250	2039-06-21
58	59	AUG02750541=	AUSTRALIAN GOVERNMENT BOND	AUGV 2.750 21-MAY-2041	2.750	2041-05-21
59	60	AUG03000347=	AUSTRALIAN GOVERNMENT BOND	AUGV 3.000 21-MAR-2047	3.000	2047-03-21
60	61	AUG01750651=	AUSTRALIAN GOVERNMENT BOND	AUGV 1.750 21-JUN-2051	1.750	2051-06-21

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Table_D_Data2:

```
Merged master dataset created. Removed 6 bonds with missing/invalid YTM.
Final bond universe size: 57
```

	Bond Code	RIC/ISIN	Issuer	Bond Name	Coupon (%)	Maturity Date	YTM_2024
0	1	AU3CB0235158	ANZ	ANZ 4.000 22-JUL-2026 MTN	4.000	2026-07-22	4.45
1	2	AU3CB0243525	ANZ	ANZ 4.100 28-SEP-2027 MTN	4.100	2027-09-28	4.53
2	3	XS0880275317	ANZ	ANZ 5.070 31-JAN-2028 MTN	5.070	2028-01-31	4.85
3	4	XS1785312395	ANZ	ANZ 4.045 28-FEB-2033 MTN	4.045	2033-02-28	5.26
4	5	XS2095795881	ANZ	ANZ 3.400 20-DEC-2039	3.400	2039-12-20	7.11

	Bond Code	RIC/ISIN	Issuer	Bond Name	Coupon (%)	Maturity Date	YTM_2024
58	57	AUG03750437=	AUSTRALIAN GOVERNMENT BOND	AUGV 3.750 21-APR-2037	3.75	2037-04-21	4.48
59	58	AUG03250639=	AUSTRALIAN GOVERNMENT BOND	AUGV 3.250 21-JUN-2039	3.25	2039-06-21	4.56
60	59	AUG02750541=	AUSTRALIAN GOVERNMENT BOND	AUGV 2.750 21-MAY-2041	2.75	2041-05-21	4.68
61	60	AUG03000347=	AUSTRALIAN GOVERNMENT BOND	AUGV 3.000 21-MAR-2047	3.00	2047-03-21	4.87
62	61	AUG01750651=	AUSTRALIAN GOVERNMENT BOND	AUGV 1.750 21-JUN-2051	1.75	2051-06-21	4.88

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Table_E1 – Portfolio Composition and Ratings

A summary of the six bonds in the portfolio, detailing their issuer, weight, Z-Spread, and credit ratings from S&P and Moody's.

				Rating			
Instrument	**Company Common Name**	**Weight**	**Z Spread**	**Rating**	**Issuer Rating**	**ESG Bond Flag**	**Maturity Date**
XS2223749958	Commonwealth Bank of Australia	22%	291.97	A2	a1	N	26/08/2050
AU3CB0235281	Macquarie Bank Ltd	9%	70.11	Aa2	A+	N	28/07/2026
AUG02500530=	Australia, Commonwealth of (Government)	16%	-7.61	AAA	AAA	N	21/05/2030
XS2436881671	Macquarie Bank Ltd	12%	95.49	Aa2	A+	N	27/01/2032
XS1694223386	Commonwealth Bank of Australia	16%	116.23	Aa2	a1	N	11/10/2047
AU3CB0298487	Worley Financial Services Pty Ltd	25%	167.66	A1	A1	Y	13/10/2028

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Table_E2 – Key Financial Ratios for Macquarie Group Ltd (MQG.AX)

A summary of key financial ratios for Macquarie Group Ltd across Capital Adequacy, Asset Quality, Profitability, and Liquidity & Funding categories for FY2024 and FY2023.

Macquarie Group Ltd (MQG.AX)					
Category	**Key Ratio**	**Purpose of the Indicator**	**Value (2024)**	**Value (2023)**	**Trend**
Capital Adequacy	Capital Adequacy - Core Tier 1 (%)	*Measures the highest quality capital against risk-weighted assets. It is the primary indicator of the ability to absorb losses.*	12.8%	13.6%	To be monitored
	Leverage Ratio - Basel 3 - %	*Provides a non-risk-weighted measure of leverage, acting as a backstop to prevent excessive balance sheet growth.*	5.1%	5.2%	Safety margin decreasing
Asset Quality	Loans - Non-Performing & Impaired Percentage of Loans - Gross - Total	*Percentage of 'problematic' loans (past due or impaired) out of the total. A low and stable value is a positive sign.*	1.0%	1.4%	Credit quality improving
	Provision & Impairment for Loan Losses	*Amount set aside to cover expected loan losses. A sudden increase is a red flag.*	AUD 258.00	AUD (134.00)	Higher expected losses
Profitability	Return on Average Common Equity - % (Income available to Common excluding Extraordinary Items)	*Measures the ability to generate profits for shareholders, which is fundamental for accumulating new capital.*	10.4%	10.2%	Profitability growing
	Operating Profit before Non-Recurring Income/Expense	*Profit generated from core business operations, an indicator of true earnings power.*	AUD 3,995.00	AUD 4,053.00	Lower operating profit
Liquidity & Funding	Loans to Deposits (End of Period)	*The ratio of loans granted to deposits collected. A value above 1.0 indicates a reliance on more volatile funding sources.*	1.31	1.35	Lower liquidity risk
	Net Cash Flow from Operating Activities	*Cash flow generated from the main business. Stability and positivity are signs of health.*	AUD 6,334.00	AUD (7,825.00)	Cash generation improving

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Table_E3 – Key Financial Ratios for Commonwealth Bank of Australia (CBA.AX)
A summary of key financial ratios for Commonwealth Bank of Australia across Capital Adequacy, Asset Quality, Profitability, and Liquidity & Funding categories for FY2024 and FY2023.

Commonwealth Bank of Australia (CBA.AX)					
Category	**Key Ratio**	**Purpose of the Indicator**	**Value (2024)**	**Value (2023)**	**Trend**
Capital Adequacy	Capital Adequacy - Core Tier 1 (%)	*Measures the highest quality capital against risk-weighted assets. It is the primary indicator of the ability to absorb losses.*	12.2%	11.5%	Strength improving
	Leverage Ratio - Basel 3 - %	*Provides a non-risk-weighted measure of leverage, acting as a backstop. A higher value is better.*	5.1%	5.2%	Safety margin decreasing
Asset Quality	Loans - Non-Performing & Impaired Percentage of Loans - Gross - Total	*The percentage of 'problematic' loans on the books. A low and stable value is a very positive sign for bondholders.*	0.8%	0.6%	Risk increasing
	Provision & Impairment for Loan Losses	*The amount expensed to cover expected future loan losses. A sudden increase is a red flag about the portfolio's health.*	AUD 1,108.00	AUD (357.00)	Higher expected losses
Profitability	Return on Average Common Equity - % (Income available to Common excluding Extraordinary Items)	*Measures the ability to generate profits, which is fundamental for accumulating new capital internally.*	14.0%	12.7%	Profitability growing
	Operating Profit before Non-Recurring Income/Expense	*Profit generated from core business operations. This shows the underlying earnings power of the institution.*	AUD 14,485.00	AUD 12,869.00	Higher operating profit
Liquidity & Funding	Loans to Deposits (End of Period)	*Shows the ratio of loans to stable customer deposits. A value above 1.0 indicates reliance on more volatile funding sources.*	1.04	1.03	Higher market reliance
	Net Cash Flow from Operating Activities	*The cash generated from the main business. Stability and positivity are crucial signs of operational health.*	(8,295.00)	23,270.00	Cash generation worsening

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Table_E4 – Key Financial Ratios for Worley Ltd (WOR.AX)

A summary of key industrial credit ratios for Worley Ltd across Leverage, Profitability, and Cash Flow categories for FY2024 and FY2023.

Worley Ltd (WOR.AX)					
Category	**Key Ratio**	**Purpose of the Indicator**	**Value (2024)**	**Value (2023)**	**Trend**
Leverage & Capital Structure	Total Debt Percentage of Total Capital	*Measures the portion of the company's capital structure that is financed by debt. A lower percentage is generally safer.*	27.4%	28.6%	Leverage improving
	Total Debt Percentage of Total Equity	*Shows the level of debt relative to the shareholders' equity base. It indicates how much creditors are funding the company versus its owners.*	37.7%	40.1%	Leverage improving
Profitability & Coverage	Interest Coverage Ratio	*Crucial for bondholders. It measures how many times the company's operating profit can cover its interest payments. A higher ratio is better.*	4.75x	4.45x	Coverage weaker
	EBITDA Margin - %	*Indicates the company's operational profitability as a percentage of its revenue. It shows the efficiency of core business operations.*	7.0%	6.8%	Margin expanding
Cash Flow & Liquidity	Net Cash Flow from Operating Activities	*Shows the actual cash generated from the primary business. Strong and positive operating cash flow is essential for servicing debt.*	AUD 682.00	AUD 260.00	Cash flow stronger
	Free Cash Flow	*This is the cash left over after capital expenditures. It represents the cash available to pay down debt or return to shareholders.*	AUD 587.00	AUD 178.00	Free cash flow declining
	Current Ratio	*Measures the company's ability to meet its short-term obligations (due within one year) with its short-term assets.*	1.2%	1.3%	Liquidity declining

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