Fair Home Bias Estimation

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October 6, 2025

Summary

Domestic Australian investors often hold equity portfolios that are significantly overweight Australian equities compared to the global market portfolio. with weights of approx. 40% compared to the market weight of 1.5%. This note examines how domestic return advantages and currency effects can help explain the home bias observed in Australian equity portfolios.

Using a reverse mean-variance optimization framework calibrated to the global equity risk premium, we show that a modest domestic return premium of 47bps can rationalize much of the observed overweight to Australian shares. In addition, when portfolio risk is measured in AUD rather than USD, the lower volatility and correlation of global equities in local currency terms can again justify a large domestic allocation, even without any assumed return premium. Together, these results suggest that both tax advantages and differences in base-currency may play an important role in shaping a rational home bias.

1 Introduction

"Home bias" is commonly observed, where domestic investors hold portfolios that overweight local assets relative to their share in the global market portfolio. This bias can be rationalized if domestic assets offer higher expected after-tax returns due to favourable tax treatment (e.g., franking credits) or other structural advantages.

This note outlines a method for quantifying the portion of home bias that can be justified purely by such return advantages.

2 Methodology

We assume, for simplicity, that the global market portfolio is mean-variance optimal[1]. Using reverse optimization, we infer implied excess returns consistent with observed global market weights, assumed ERP and the covariance matrix of returns. We then introduce an additive domestic return premium for local investors, and re-solve for optimal portfolio weights.

[1] This assumption follows CAPM logic, though it is known to be violated in practice, we adopt it here only as a simplifying device.

2.1 Setup

Divide the world into two regions: the domestic market of the investor (Country A) and the rest of the world.

- $w^m = [w_A, w_W]$: Market-cap weights for Country A and the rest of the world,
- Σ: Covariance matrix of returns, assumed to be available from capital market assumptions or historical estimation,
- δ: Additive domestic excess return premium due to tax treatment or other advantages.
- ERP: We avoid specifying risk aversion directly by calibrating implied returns to a target world equity risk premium (ERP), denoted $\mathrm{ERP}^\star$. We use the historical estimate from Dimson et al., 2008 of 3.5%.

2.2 Step 1: Implied Global Excess Returns (ERP-calibrated)

Assuming the global market portfolio is mean-variance optimal:

$$\mu^{\mathrm{impl}} = \gamma \Sigma w^m$$

where γ is the investor's (unknown) risk aversion coefficient. γ is usually calibrated to provide implied excess returns μ^{impl} that are equal to the estimated equity risk premium for the market as a whole.

To avoid this calibration step, we replace γ with a scale factor s, $\mu^{\mathrm{impl}} = s\,\Sigma w^m$, and choose the scale s so that the world portfolio's excess return equals $\mathrm{ERP}^\star$:

$$(w^m)^\top \mu^{\mathrm{impl}} = \mathrm{ERP}^\star.$$

This yields

$$s = \frac{\mathrm{ERP}^\star}{(w^m)^\top \Sigma w^m}, \qquad \Rightarrow \qquad \mu^{\mathrm{impl}} = \frac{\mathrm{ERP}^\star}{(w^m)^\top \Sigma w^m}\,\Sigma w^m.$$

2.3 Step 2: Apply Adjustment for Domestic Investor

For an investor in Country A, add the estimated domestic premium δ to the implied return on domestic assets:

$$\tilde{\mu} = [\mu_A^{\mathrm{impl}} + \delta,\ \mu_W^{\mathrm{impl}}]$$

2.4 Step 3: Solve for Optimal Weights

The adjusted optimal weights for the domestic investor are given by:

$$\tilde{w} = \frac{\Sigma^{-1}\tilde{\mu}}{\mathbf{1}^\top \Sigma^{-1}\tilde{\mu}}$$

3 Application - Australia

Australia has a weight of approximately 1.5% in the MSCI ACWI index, but diversified portfolios in Australia typically hold a much larger allocation to local equities. For example, the Vanguard All-Growth ETF (100% Equity) has an Australian equity allocation of 39%.

Measured in USD, historical volatility of Australian equities is 19.8%, compared to 15.5% for the rest of the world, with a correlation of 88%.

Using these inputs in the model, without any domestic premium ($\delta = 0$), the optimal weight matches the global market weight of 1.5%. **With a domestic return premium of $\delta = 0.47\%$, the optimal allocation aligns with actual observed home bias in the Vanguard fund**, with an optimal allocation of 39% to Australian equities. This implied premium can be compared against the franking credit yield historically available to domestic investors, which has historically ranged from 90–150bps at an index level.

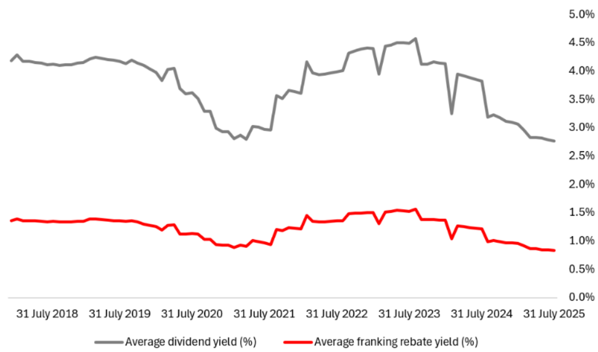

Figure 1: Australian dividend and franking credit yield, sourced from Australian Taxation Office, 2025

These results rely on risk assumptions (vol, correlation) that are usually estimated on historical data with wide confidence intervals, so it is worthwhile to understand how the results change if the inputs are changed.

The relationship between the advantage of the home investor, δ, and the weight of domestic equities is positive and linear.

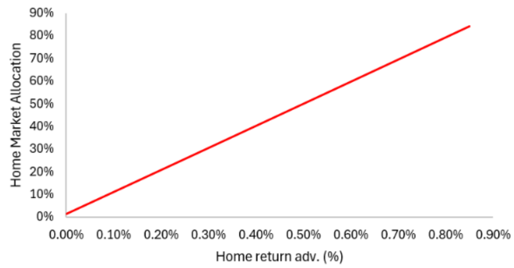

Figure 2: Variation in mean-variance optimal weight with different levels of domestic return premium δ

By contrast, the relationship between the correlation between home and offshore investments, and the weight of domestic equities is positive and exponential.

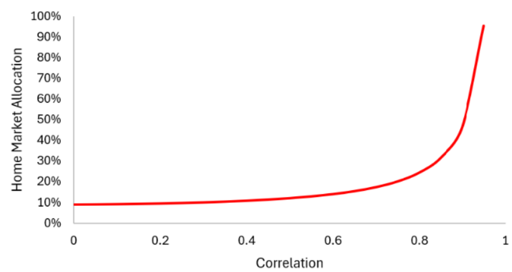

Figure 3: Variation in mean-variance optimal weight with different levels of asset class correlation

The relationship between weight of domestic equities and volatility are positive for global volatility, and negative for home volatility.

Another approach to explore the sensitivity of the solution to inputs is to use a monte-carlo simulation, drawing the input from a normal distribution for each input with a mean at the sample estimate[2]. Sampling over 4000 iterations gives a wide distribution of optimal weights, with an interquartile range (IQR) from 31% to 47.9%.

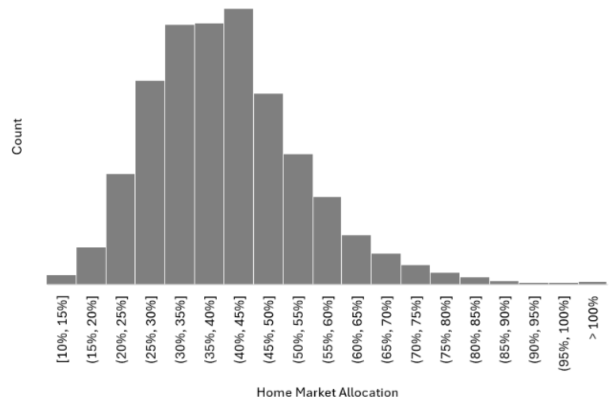

Figure 4: Variation in mean-variance optimal domestic weight over a monte-carlo simulation of the inputs, 4000 iterations.

We can also reverse the test, holding the domestic allocation constant at 39% while we samples over volatility and correlation assumptions, solving for the required domestic investor advantage. This gives an IQR from 0.40% to 0.53%.

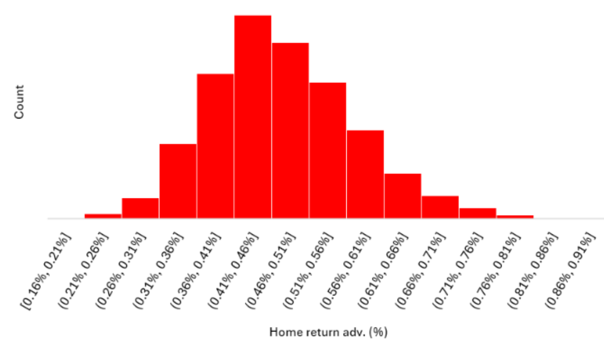

Figure 5: Variation in the home investor advantage, δ, required to meet a 39% domestic allocation, over a monte-carlo simulation of the inputs, 4000 iterations.

[2] See appendix for stdev assumptions

4 But what about currency?

An implicit assumption in the previous analysis is that either currency is not a factor or the domestic and foreign investor both care about their outcomes in the same base currency. For Australia, currency is of particular importance, as the AUD has historically been positively correlated with global equity returns. If the Australian investor cares about their outcomes in AUD, and the offshore investor bases their decisions on USD returns, their risk view of the investment set differs materially.

Investor currency	Global Equity Vol	Aus Equity Vol	Correlation
USD	15.5	19.8	88
AUD	11.8	14.1	74

Table 1: Risk metrics in USD & AUD. All values are percentages. Data sourced from Google finance, using iShares ETFs as market proxies (EWA, URTH), with data from 2025-2025. Risk metrics calculated with a 1M rolling window, annualised by multiplying by $\sqrt{12}$

We can apply this difference by substituting the AUD investors covariance matrix in for step 3 of the method, to evaluate the decision from an AUD perspective. This assumes no view on currency return, only the contribution of currency to risk. **Assuming zero home investor advantage ($\delta = 0$), this results in an allocation to Australian equities of 36%.** This suggests that the domestic overweight could be explained partially or fully by base currency differences.

References

Australian Taxation Office. (2025). Company tax and imputation: Average franking credit and rebate yields [Accessed: 30 September 2025].

Dimson, E., Marsh, P., & Staunton, M. (2008). The worldwide equity premium: A smaller puzzle. In R. Mehra (Ed.), *Handbook of the equity risk premium* (pp. 467–514). Elsevier. https://doi.org/10.1016/B978-044450862-2.50020-0

5 Appendix

Derivation of Reverse Optimization

Consider the mean-variance utility maximization problem:

$$\max_{w} \quad w^\top \mu - \frac{\gamma}{2} w^\top \Sigma w$$

subject to:

$$\mathbf{1}^\top w = 1$$

The unconstrained solution is:

$$w^* = \frac{1}{\gamma} \Sigma^{-1} \mu$$

Solving for μ gives the reverse optimization expression:

$$\mu = \gamma \Sigma w^*$$

This expression yields the implied expected excess returns consistent with observed portfolio weights and risk estimates.

5.1 Monte-Carlo distributional properties

The inputs are sampled from a normal distribution. The mean of the distribution is set to the estimated value. This is the sample mean for volatility and correlation, and an example home advantage of $\delta = 0.47\%$.
The standard deviation is the standard errors of the estimated value:

- Home advantage: Sample standard deviation for franking credit yield is used.
- Correlation: The Fisher approximation of SE for correlation is used: $\frac{1-\rho^2}{\sqrt{n-3}}$
- Volatility: A Taylor series approximation for SE of volatility is used: $\frac{s}{\sqrt{2(n-1)}}$

This gives a SE of 0.9% for global volatility, 1.2% for Australian volatility, 2% for correlation, 0.1% for home advantage.