

Research

# Appraising home bias exposure

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## Executive summary

This paper assesses both the extent and impact of home bias in the equity allocation of five large pension fund markets by examining the characteristics, performance and return/risk profiles of each market.

The findings reveal interesting variations in the impact of home bias exposure across the regions between 2008 and 2019. In most regions, except for the US, overseas equities outperformed domestic equities, with the movement in exchange rates having a large effect on risk-adjusted returns. Overall, home bias was highly positive in the US, but negative in the UK, Japan, Canada and Australia.

Studies have shown that pension funds have inherent home biases within their equity allocations. The OECD explains that pension providers have tended to invest less than they should in foreign securities compared to the proportion of foreign securities in global financial markets, contrary to Modern Portfolio Theory<sup>1</sup>, which encourages diversification of assets to lower investment risks. The OECD cites several explanations for this persistent investor preference, including the desire to avoid exposure to exchange rate or political risk, the extra costs to hedge against these risks, regulatory barriers<sup>2</sup> and asset-liability matching needs<sup>3</sup>. In another study, the Thinking Ahead Institute<sup>4</sup> research attempts to quantify the level of domestic biases in several markets and shows that they have been pervasive across regions.

In this paper, we seek to understand whether a home bias in the equity allocations of pension funds has benefited investors. We measure their extent and analyze their effects over a 12-year period. A summary of the findings is presented in the overview section and is followed by a detailed analysis of each region.

For the purpose of the analysis, we use the FTSE All-World Index – a sub-index of the FTSE Global Equity Index Series (FTSE GEIS) that includes large and mid-cap developed and emerging companies – for its representation of the global universe of listed companies. An overview of the index is in the Appendix.

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<sup>1</sup> Portfolio Selection, the Journal of Finance, Vol 7, No 1 (Mar. 1952) H. Markowitz

<sup>2</sup> Pension Markets in Focus 2017, OECD.

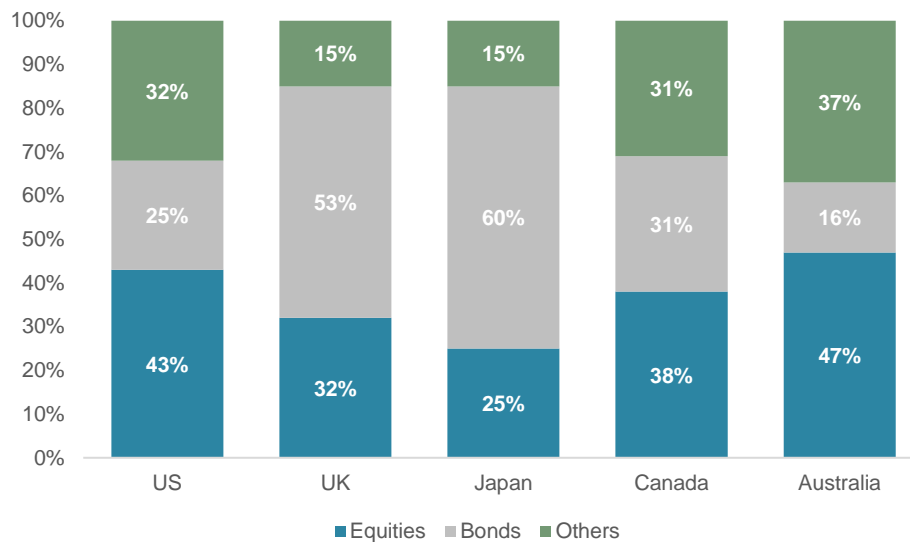
<sup>3</sup> Liberalising Foreign Investments by Pensions Funds: Positive and Normative Aspects, OECD Working Paper 5.3.

<sup>4</sup> Thinking Ahead Institute, Willis Towers Watson "Global Pension Assets Study 2019".

## Overview

A recent study<sup>4</sup> showed that pension fund providers in the US, UK, Japan, Canada and Australia allocated less than 50% of their overall assets to equities in 2018 (blue area in Chart 1). This represents a substantial downsizing of the equity allocation over the last 20 years. Note that in markets where equities used to be a dominant asset 10 years ago, some markets, like Japan, have allocated as little as 25% more recently.

**Chart 1: Pension funds estimated asset allocation in 2018**



We used the FTSE All-World Index to measure the degree of home biases within the equity allocation of pension funds.

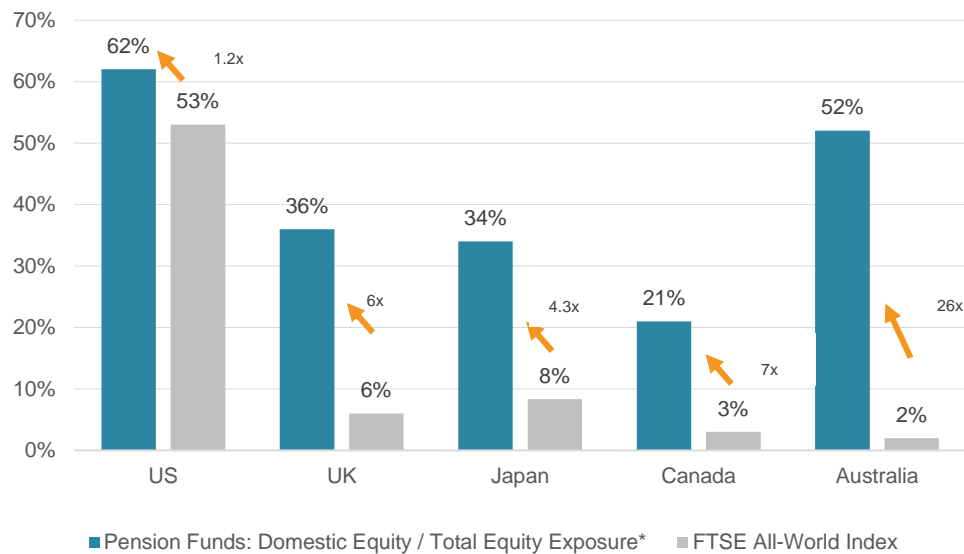
Source: Thinking Ahead Institute, Willis Towers Watson<sup>4</sup>.

The same study estimated the percentage of domestic allocation within each region's total equity allocation in 2018. Using this data and comparing it with the weight of the respective markets in the FTSE All-World Index, we can gauge the size of the home bias within an equity allocation. The results are shown in Chart 2. The blue bar represents the estimated percentage of total equities allocated to domestic equities in 2018 from the study, and the grey bar signifies the weight of the regional index in the FTSE All-World Index. The difference in weight is converted into a ratio.

Across the large pension fund markets, Australia stands out for having the largest disparity between its allocation to domestic equities (52%) and its weight in the FTSE All-World Index (2%), which translates into a ratio of 26 times. By contrast, the disparity is smallest for the US (although this largely reflects the US accounting for more than half the weight of the global index).

<sup>4</sup> Thinking Ahead Institute, Willis Towers Watson "Global Pension Assets Study 2019".

**Chart 2: Pension funds estimated allocation to domestic equities relative to total equity exposure<sup>4</sup> and country weight in the FTSE All-World Index**



Australia and the US stand out for having the largest and smallest disparities respectively, between their allocations to domestic equities and their weights in the global index.

Source: FTSE Russell as of December 31, 2018 and \*Thinking Ahead Institute, Willis Towers Watson.<sup>4</sup>

As this analysis reveals, home bias is pervasive across major markets. But, in considering the overall opportunity set, has it been good for investors?

- Our analysis finds that between 2008-2019, there have been pros and cons to holding domestic-equity biases in pension funds. However, most of the pension fund markets studied revealed that overseas equities have generally outperformed domestic equities over the period.
- Of the five markets examined, the US was the only region, in which a home bias would have strongly benefited investors. In fact, not having a US bias in portfolios would have been a significant opportunity cost for investors. US equities produced better risk-adjusted returns versus overseas equities for over 80% of the period examined.
- However, these results need to be assessed within the context of the recessionary environment and the extraordinary monetary measures undertaken in the aftermath of the global financial crisis. This unusual set of conditions underpinned the surge in US equities at the expense of overseas equity markets and resulted in the appreciation of the US dollar.
- In the UK, Japan, Canada and Australia, home bias was negative for investors, with domestic equities generating higher risk-adjusted returns than overseas equities for only 25% (and lower) of the period reviewed.

Table 1 summarizes the main findings for each region and evaluates the overall impact of a home bias from an investor's perspective.

**Table 1: Summary of home-bias impact on investor outcomes**

	US (USD)	UK (GBP)	Japan (JPY)	Canada (CAD)	Australia (AUD)
<b>Home-bias ratio</b> (based on Chart 4)	1.2x	6x	4.3x	7x	26x
<b>Domestic vs overseas revenue source</b>					
% of revenue generated by market constituents domestically*.	64%	23%	40%	51%	61%
<b>Relative outperformance in calendar years</b>					
Number of years domestic equities outperformed overseas equities, in base currency.	9 / 12yrs	3 / 12yrs	3 / 12yrs	3 / 12yrs	5 / 12yrs
<b>Currency impact in calendar years</b>					
Number of years base currency appreciation improved returns.	9 / 12yrs	3 / 12yrs	7 / 12yrs	5 / 12yrs	5 / 12yrs
<b>Return/risk ratio in calendar years</b>					
Number of years domestic equities delivered better risk-adjusted returns.	10 / 12yrs	2 / 12yrs	2 / 12yrs	3 / 12yrs	3 / 12yrs
<b>Conclusion</b>					
Was home bias positive or negative?	Positive	Negative	Negative	Negative	Negative

Source: FTSE Russell to June 28, 2019 (Q2 2019). Past performance is no guarantee of future results. Please see the end for important legal disclosures. \*On December 31, 2017.

The next section provides a detailed analysis of the impact of home bias for each region.

## Regional analysis

### Australia

In Chart 1, we saw that pension funds in Australia had allocated 47% of their total asset allocation to equities in 2018, of which an estimated 52% was invested in the domestic market. Dividing the latter number by the weight of Australia in the FTSE All-World Index (2%) produces a ratio of 26 times, by far the largest of the five markets we studied.

**Chart 3: Home-bias ratio for Australia**



The 26 times home-basis ratio for Australia is by far the largest of the five markets we studied.

Source: \*Thinking Ahead Institute, Willis Towers Watson "Global Pension Assets Study 2019,"<sup>4</sup> and FTSE All-World as of December 31, 2018.

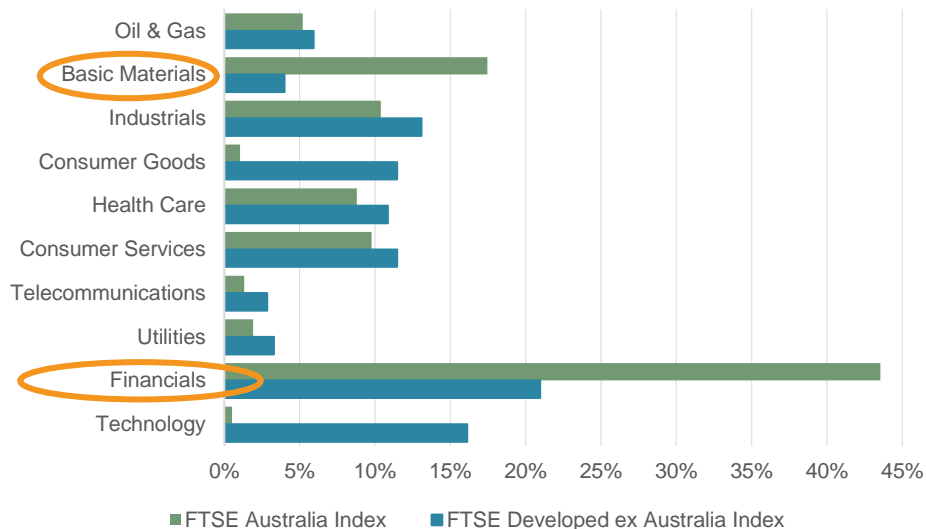
### Understanding the Australian equity market

To better understand how home bias affects performance, it is important to examine both the Industry Group (ICB) exposures and the composition of corporate revenue sources.

As seen in Chart 4, the Australian equity market (represented by the FTSE Australia Index) is heavily concentrated in two prominent industries – basic materials and financials (including real estate, which account for about 7% of financials). The two industries account for more than 60% of the total market cap. The FTSE Australia Index is also significantly underweighted in technology and consumer goods.

**Chart 4: Australia and overseas industry weights (%)**

The Australian equity market is concentrated in basic materials and financials relative to the global index.

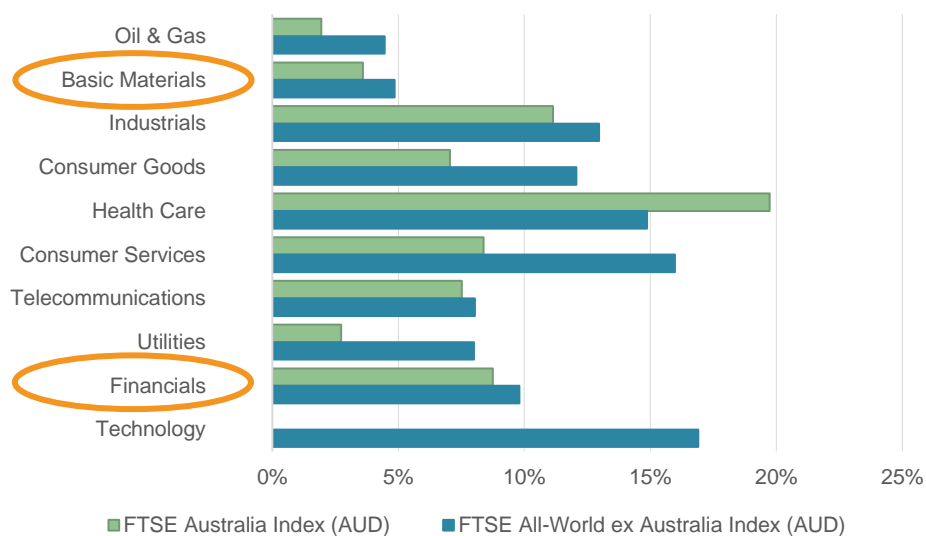


Source: FTSE Russell; data using FTSE Australia Index and FTSE All-World ex Australia Index as June 28, 2019.

As Chart 5 shows, Australian basic materials and financials have both underperformed their overseas counterparts over the period examined. Australian health care was the only outperforming industry.

**Chart 5: Australia and overseas average annualized industry returns % (2008-2019)**

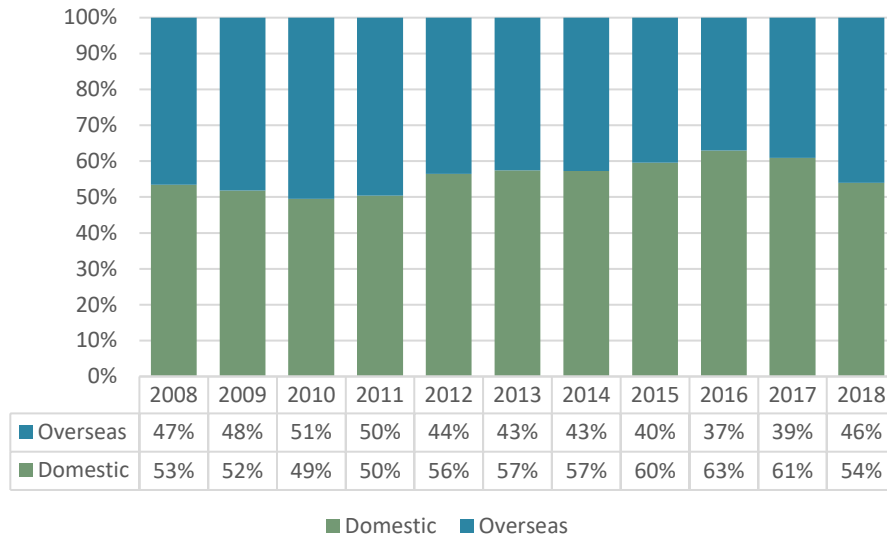
Australian basic materials and financials have underperformed their overseas counterparts.



Source: FTSE Russell; data using FTSE Australia and FTSE Developed ex Australia total returns in AUD from Industry Classification Benchmark between December 31, 2007 and June 28, 2019 (Q2). Past performance is no guarantee of future results. Please see the end for important legal disclosures.

By comparing revenue sources, we see that Australian equities have derived their revenues evenly between domestic and overseas over the last 10 years (Chart 6).

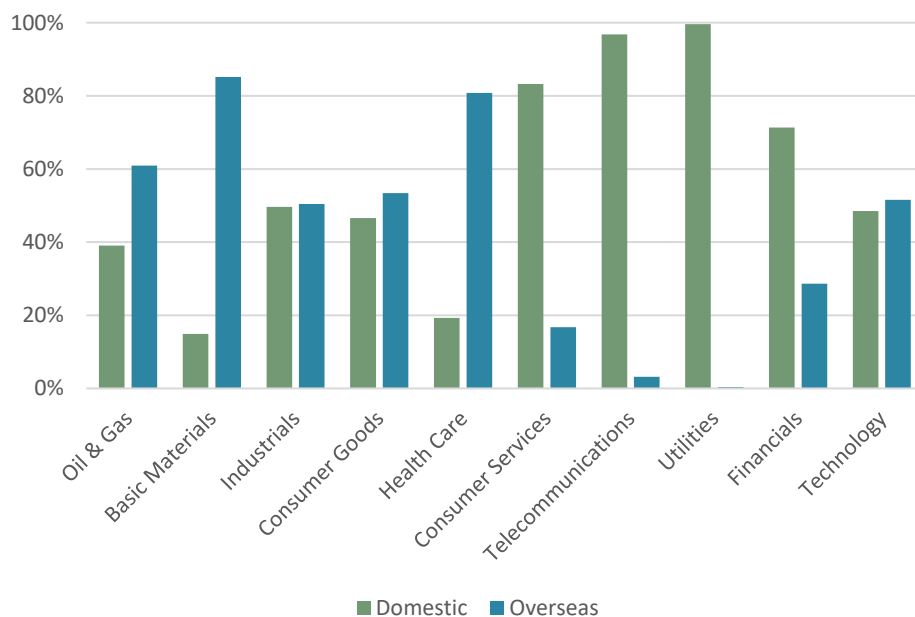
**Chart 6: Breakdown of the FTSE Australia Index by domestic and overseas revenues (%)**



Source: FTSE Russell as of December 31, 2018.

Examining the revenue breakdowns by industry, we find that Australian basic materials, oil and gas and health care companies are heavily dependent on overseas revenues (Chart 7).

**Chart 7: FTSE Australia Index domestic and overseas revenues breakdown by industry (%)**



Source: FTSE Russell as of December 31, 2018 using Industry Classification Benchmark.

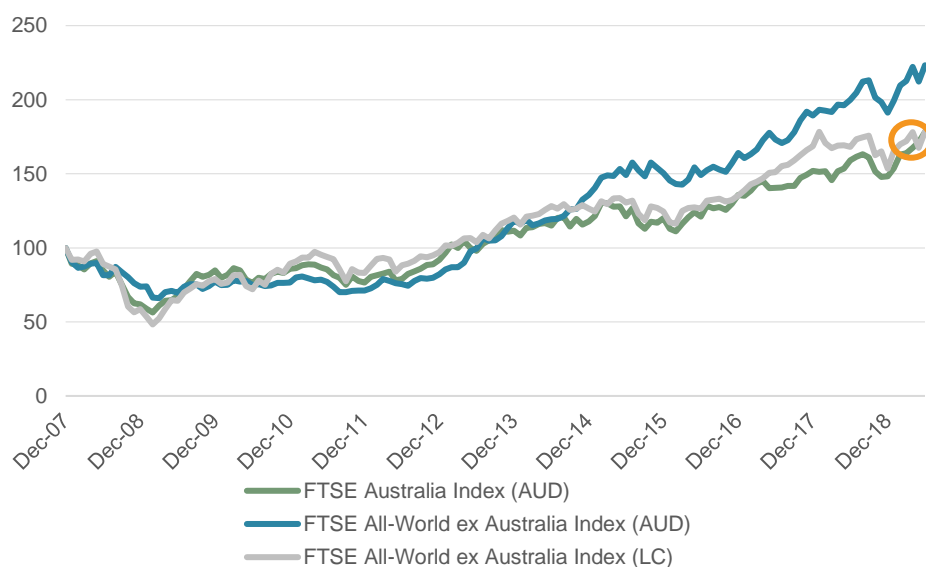


## Assessing the effect of Australian home bias: performance

In Chart 8, we compare the performance of Australian equities (FTSE Australia) against the global index (FTSE All-World ex Australia), in Australian dollar and local currency terms, to strip out the currency effect. A depreciating currency improves the overseas equities returns (in AUD) of an Australian-based investor (and vice versa).

On a cumulative basis, overseas equities have outperformed Australian equities over the last decade or so. In Australian dollar terms, overseas equity returns began diverging from those of Australian equities in 2014. However, the cumulative performance of both Australian and overseas equity markets has been similar, in local currency terms, during the period.

**Chart 8: Cumulative total returns of the FTSE Australia Index (AUD) and the FTSE All-World ex Australia Index (AUD & local currency), rebased**



The performance of Australian equities has been similar to overseas equities during the last 12 years but was significantly lower than that of overseas equities (in AUD), due to the weak Australian dollar.

Source: FTSE Russell from December 31, 2007 to June 28, 2019 (Q2 2019). Past performance is no guarantee of future results. Please see the end for important legal disclosures.

Looking at the trade-weighted movements of the Australian dollar against a basket of foreign currencies, Chart 9 shows that the Australian dollar appreciated up until 2012-2013 and has weakened since then.

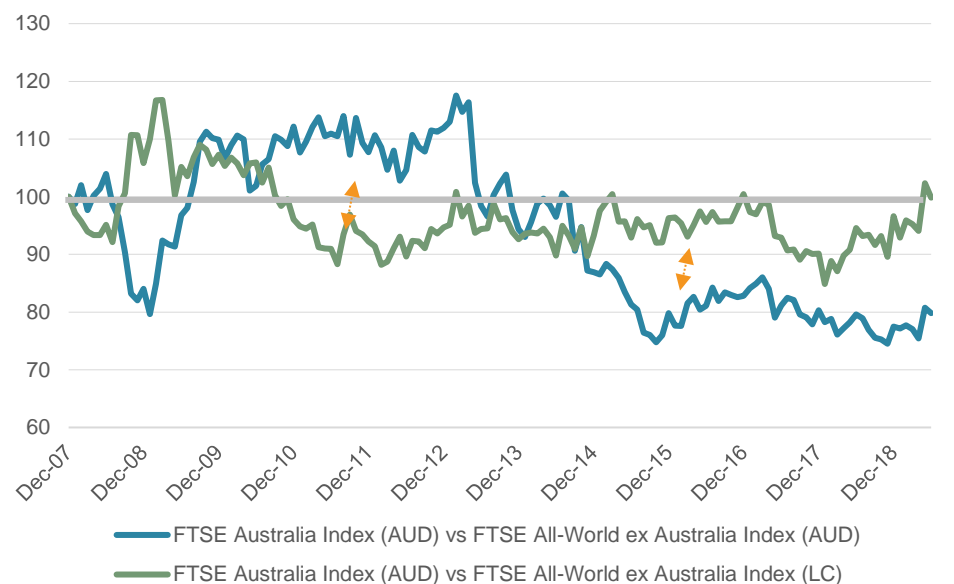
**Chart 9: Trade-Weighted AUD Index, rebased**



Source: FTSE Russell from December 31, 2007 to June 28, 2019 (Q2 2019).

A closer inspection, however, reveals variations in performance during the period. In Australian dollar terms, Australian equities outperformed overseas equities until 2013 and underperformed thereafter. In local currency terms, except for the period immediately after the global financial crisis, returns for both overseas and Australian equities have been similar. The underperformance of Australian equities since 2013 has been more pronounced in Australian dollars (blue line) than in local currency terms (green line), reflecting the negative effects from the weak Australian dollar.

**Chart 10: Relative total returns of the FTSE Australia Index (AUD) versus the FTSE All-World ex Australia Index (AUD & local currency), rebased**



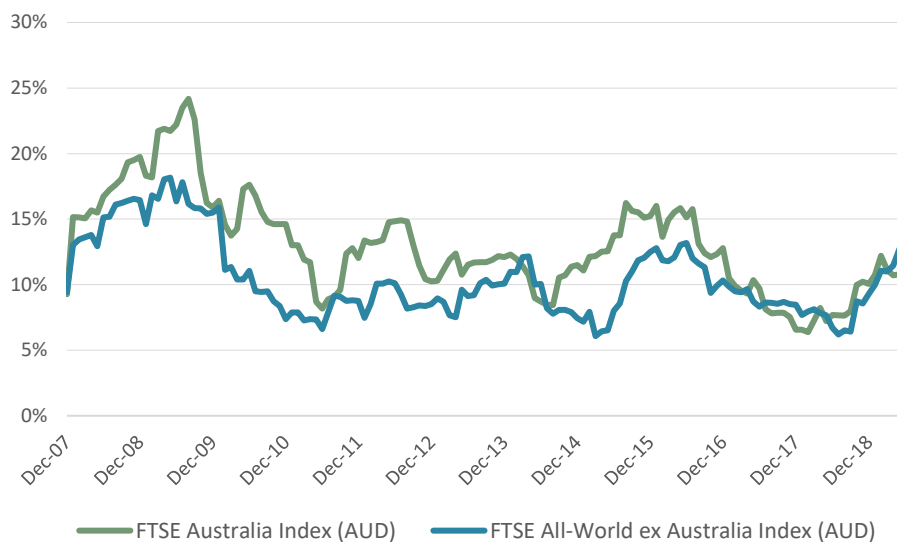
Source: FTSE Russell from December 31, 2007 to June 28, 2019 (Q2 2019). Past performance is no guarantee of future results. Please see the end for important legal disclosures.

The trade-weighted performance shows the Australian dollar appreciating up to 2012, then depreciating thereafter.

## Assessing the effect of Australian home bias: risk and return

Moreover, Australian equities have also been more volatile than their overseas peers during the period examined (Chart 11).

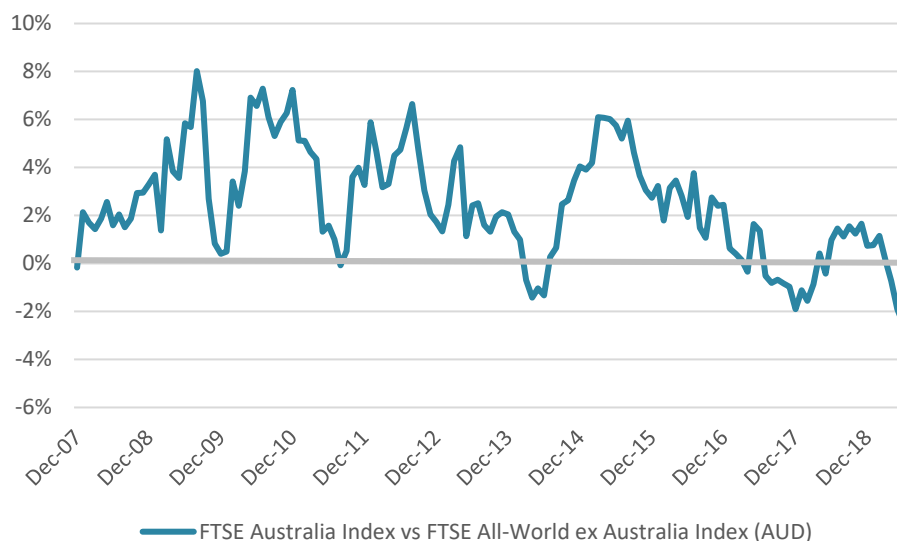
**Chart 11: 1Y rolling annualized volatility of the FTSE Australia Index (AUD) and the FTSE All-World ex Australia Index (AUD) – Absolute**



Source: FTSE Russell from December 31, 2007 to June 28, 2019 (Q2 2019).

Chart 12 compares the relative volatility between overseas and Australian equities. Australian equities have generally been more volatile than overseas equities during the period, except in 2014, 2017 and 2019.

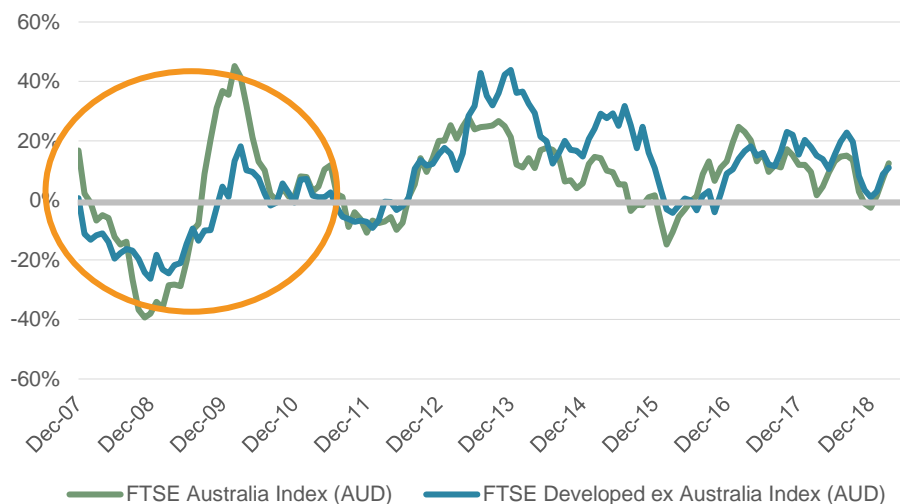
**Chart 12: 1Y rolling annualized volatility difference of the FTSE Australia Index (AUD) and the FTSE All-World ex Australia Index (AUD) – Relative**



Source: FTSE Russell from December 31, 2007 June 28, 2019 (Q2 2019).

On a rolling-returns basis, Australian equities mostly outperformed overseas equities until 2011, and generally underperformed thereafter (Chart 13).

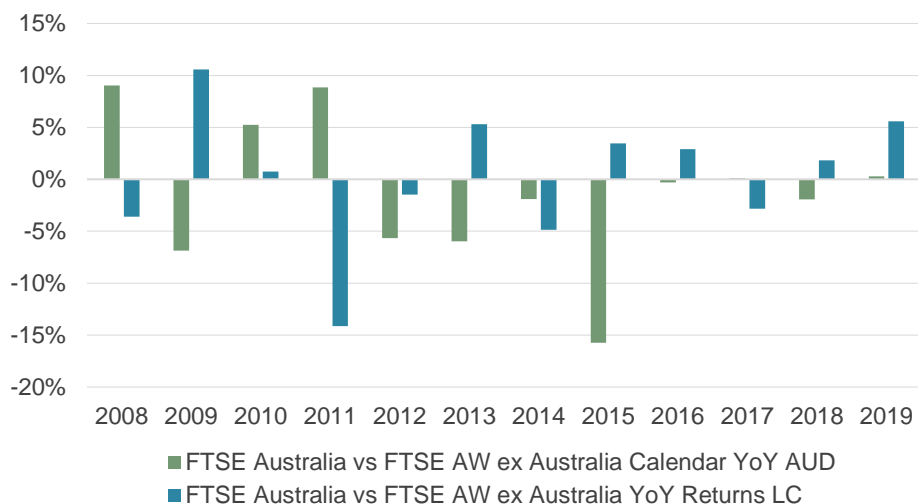
**Chart 13: 1Y rolling returns of the FTSE Australia Index vs the FTSE All-World ex Australia Index, AUD – Absolute**



Source: FTSE Russell December 31, 2007 to June 28, 2019 (Q2 2019). Past performance is no guarantee of future results. Please see the end for important legal disclosures.

The histogram in Chart 14 illustrates the profound impact of fluctuations in the Australian dollar on relative Australian equity performance, as evidenced by the wide disparity in returns in Australian dollars (green bars) and local currency (blue bars). Australian equities outperformed their overseas peers in Australian dollars in 2008, 2010 and 2011, coinciding with periods of Australian dollar appreciation. The strong Australian dollar also helped limit the underperformance of Australian equities for domestic investors in 2014 and 2017. Nonetheless, the weaker currency reduced relative returns in half of the years from 2012 onwards (especially in 2015).

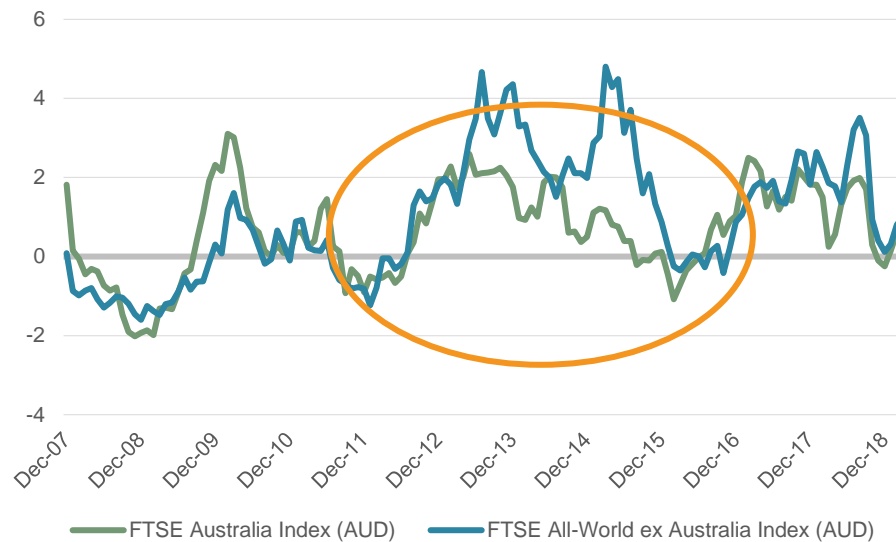
**Chart 14: Year-on-year returns of the FTSE Australia Index (AUD) vs the FTSE All-World ex Australia Index (AUD & local currency) – Relative**



Source: FTSE Russell to June 28, 2019 (Q2 2019). Past performance is no guarantee of future results. Please see the end for important legal disclosures.

Chart 15 reaffirms that the period between 2012 and 2016 was the most painful for Australian investors, when the risk-adjusted returns of Australian equities were lower than those of overseas equities, in Australian dollar. Both markets registered similar risk-adjusted returns in the interval periods.

**Chart 15: 1Y rolling return/risk ratios of the FTSE Australia Index and the FTSE All-World ex Australia Index (AUD)**

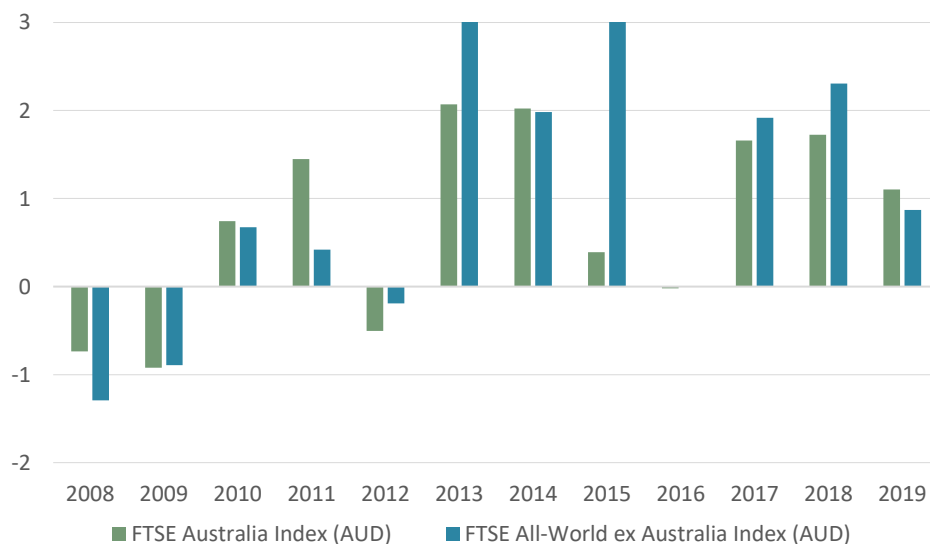


Australian equities significantly underperformed and were more volatile than overseas equities for most of the period examined.

Source: FTSE Russell from December 31, 2007 to June 28, 2019 (Q2 2019). Past performance is no guarantee of future results. Please see the end for important legal disclosures.

The histogram in Chart 16 clearly shows that overseas equities had better risk-adjusted returns than Australian equities from 2012 onwards, with 2013 and 2015 being the standout years. This means for nearly half of the period examined, overseas equities had better risk-adjusted returns than Australian equities.

**Chart 16: Year-on-year return/risk ratios of the FTSE Australia Index and the FTSE All-World ex Australia Index (AUD) – Absolute**



Source: FTSE Russell to June 28, 2019 (Q2 2019). Past performance is no guarantee of future results. Please see the end for important legal disclosures.

## Conclusion

By this analysis, we can conclude that a home bias to Australian equities would have been costly for Australian investors, mostly in the last eight years of the period reviewed. We also note that currency movements have had a material impact on relative performance, with about half of the period seeing returns suffer as a result of Australian dollar weakness, which improved overseas returns for Australian investors.

## Appendix

The FTSE Global Equity Index Series (GEIS) covers about 99% of the global equity market. The Series provides a flexible building-block approach to meet the needs of market participants.

### FTSE GEIS

Data-driven classification at a granular level.  
The confluence of top-down and bottom-up analysis

MARKET STATUS		SIZE		STYLE		SECTOR (ICB®)	
Developed	Advanced Emerging	Large	Mid	Growth	Value	Industries	Sectors
Secondary Emerging	Frontier	Small	Micro	Defensive	Dynamic	Supersectors	Subsectors

FTSE GEIS is divisible into modular subcomponents, such as the large and mid-cap FTSE All-World Index and the FTSE Global Small Cap Index, which combine into a large, mid and small-capitalization index, the FTSE Global All Cap Index.

A wide range of other sub-indexes that further segments the market by size (including micro-cap), sectors, regions, and individual countries are also available, a sample of which is listed below:

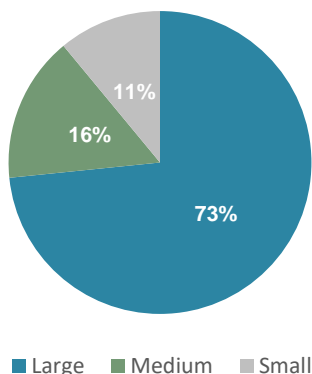
Index	FTSE Global Total Cap	FTSE Global All Cap	FTSE All-World	FTSE Global Small Cap	FTSE Global Micro Cap
<b>Include cap segments</b>	Large, Mid, Small, Micro	Large, Mid, Small	Large, Mid	Small	Micro
<b>%of FTSE Global Total Cap Index</b>	100%	98%	87%	11%	2%
<b>Net Mcap (USDt)</b>	54.0	52.8	47.0	5.8	1.1
<b>Number of constituents</b>	17,294	8,910	3,928	4,982	8,384

Source: FTSE Russell, data as of June 28, 2019.

### Summary of the FTSE Global All Cap Index features

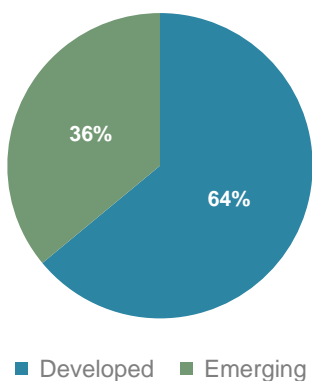
Charts 17 and 18 show the size and regional breakdown of the FTSE Global All Cap Index and Table 2 provides more granular segmentation, including the number of constituents. For the FTSE Global All Cap Index, 73% of the index is made up of large companies and 64% is classified as Developed.

Chart 17: FTSE Global All Cap Index – percentage of total market cap by size



Source: FTSE Russell as of June 28, 2019.

Chart 18: FTSE Global All Cap Index – percentage of total market cap segmented by Developed and Emerging companies



Source: FTSE Russell as of June 28, 2019.

Table 2: Further size and constituent numbers breakdown by Developed and Emerging

FTSE Global All Cap Index Composition Breakdown		
Index	%	Constituent numbers
<b>Developed (of which)</b>	<b>64%</b>	<b>5,711</b>
Large	73%	911
Medium	16%	1,266
Small	11%	3,534
<b>Emerging (of which)</b>	<b>36%</b>	<b>3,199</b>
Large	80%	865
Medium	11%	886
Small	9%	1,448
<b>Total</b>	<b>100%</b>	<b>8,910</b>

Source: FTSE Russell as of June 28, 2018.



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