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BEHAVIOURAL FACTORS IN SMSF ASSET ALLOCATION

A report prepared by the SMSF Centre of Excellence, in collaboration with SuperConcepts and the International Centre for Financial Services, University of Adelaide.

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INTRODUCTION

SMSFs (self-managed superannuation funds) primarily invest in three asset classes – cash, domestic shares and direct property. Commentators often suggest that home bias – a behavioural trait of investors who disproportionately prefer more familiar domestic assets – is responsible for the lack of international asset holdings in SMSFs. Bias may also be responsible for the larger cash holdings in SMSFs, as these funds prefer to re-invest their investment income into cash, forgoing potentially greater growth if the income were to be invested in other asset classes. Our report aims to investigate some behavioural factors that contribute to the asset allocation decisions of SMSFs. Regulators and advisors can benefit from the identification of these behavioural factors by providing education and/or training to trustees to overcome these biases.

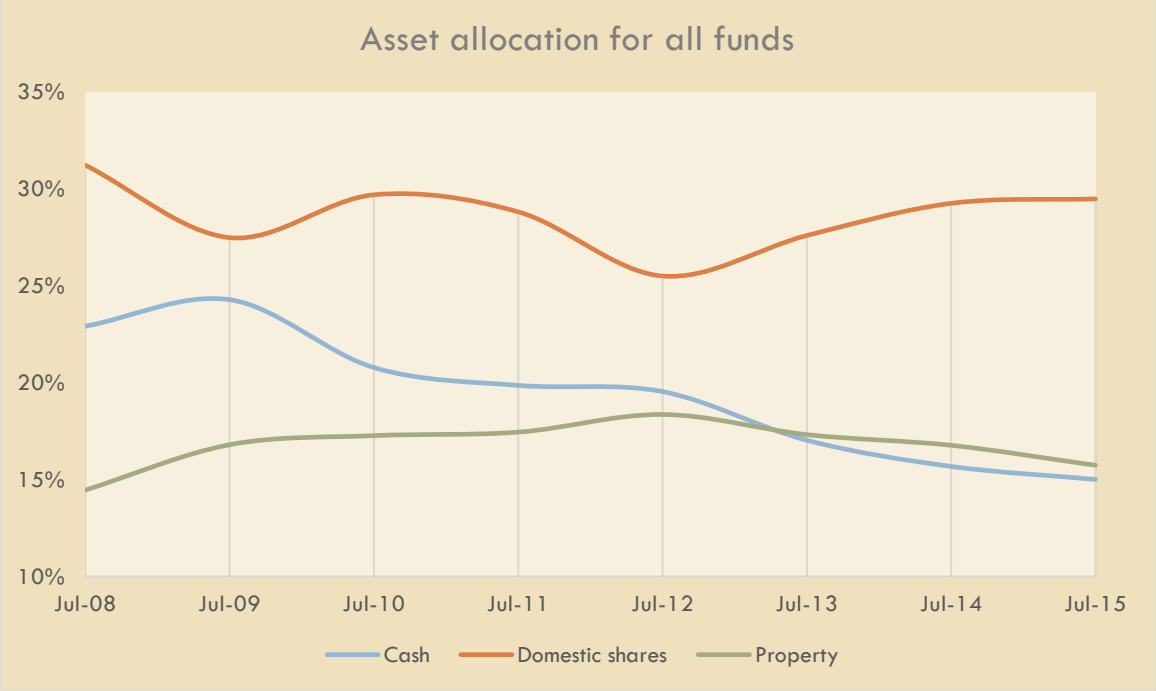
We use a comprehensive dataset to investigate the behavioural factors that influence SMSF asset allocation decisions. Using longitudinal data on 20,121 unique SMSFs between the 2008 and 2015 fiscal years, we examine the impact of gender and number of trustees on asset allocation preferences for cash, domestic shares and property. We find that gender has a significant impact on asset allocation decisions. Funds with greater numbers of male trustees tend to invest more in risky assets (i.e. domestic shares and property) and less in riskless assets (i.e. cash). We also find that funds tend toward safe investment when the number of trustees increases. The net effect of these behavioural factors seems to align with changes in the asset allocation decisions of SMSFs

across our sample. Overall our findings indicate a significant influence of behavioural traits on the way SMSFs allocate their assets.

SUMMARY STATISTICS

	No. of unique funds	No. of fund-years	Average no. of trustees per fund
Sample	**20,121**	**88,255**	**2**

SMSFs	Average age of trustees (as of 7/2015)	Proportion of male trustees (%)	Average fund age (years)
	61	**55**	**10**



Asset class	Jul-08	Jul-09	Jul-10	Jul-11	Jul-12	Jul-13	Jul-14	Jul-15
Cash	22.91%	24.28%	20.78%	19.86%	19.54%	17.03%	15.68%	15.01%
Australian shares	31.22%	27.48%	29.69%	28.81%	25.50%	27.59%	29.25%	29.48%
Property	14.46%	16.80%	17.27%	17.45%	18.36%	17.32%	16.77%	15.74%
Unit trusts	17.83%	15.43%	15.50%	14.84%	14.75%	15.78%	16.75%	19.19%
Fixed interest	7.24%	8.77%	9.51%	11.36%	14.83%	14.53%	12.65%	11.12%
Overseas investment	0.69%	0.67%	0.85%	0.97%	0.87%	1.21%	1.59%	1.88%
Other	5.66%	6.56%	6.41%	6.71%	6.16%	6.56%	7.31%	7.57%
Total	100%	100%	100%	100%	100%	100%	100%	100%

The average asset value for all SMSFs included in our data is $845,000. Over the observation period, the lowest average asset value ($722,214) occurs in the 2009-10 fiscal year, and the highest average asset value ($1,045,938) occurs in the 2014-15 fiscal year. Combinations of the 20,121 unique funds over the observation period of 8 (eight) years provide us with a data set of 88,255 fund-year observations. The dataset starts with around 9,600 SMSFs at the beginning of our observation period and increases to a maximum of 15,430 SMSFs in the 2013-14 fiscal year. The number of funds thereafter drops to around 11,000 funds for the 2014-15 fiscal year. On average, the SMSFs in our dataset have two trustees. It is noteworthy that a majority of funds in our data either have 1 (one) or 2 (two) trustees with a small proportion of funds having more than 2 (two) trustees. The average age of trustees is 61 years old (as of July 2015) and there seems to be a relatively even gender split within the sample with 55 per cent of trustees being male.

Throughout our sample period, the investment weight for domestic shares consistently dominates the weighting of investments in all other asset classes. At the end of the 2008 fiscal year, funds in our sample had invested around 30 per cent of their net worth in domestic shares, with this figure being slightly lower by July 2015. Cash holdings have experienced a decline in weight since 2008. Investment in cash has declined from 23 per cent in July 2008 to 15 per cent in July 2015. Allocation to property has been relatively stable in the band between 15 to 18 per cent throughout the 8 (eight) years. While the weightings of investments in unit trusts and fixed interest instruments are not small, we do not include these two asset classes in our analysis because we want to perform a direct comparison between the effect of behavioural factors on investment allocations to cash (relatively riskless), and domestic shares and property (relatively risky). We exclude overseas and other investments because the weights of these asset classes are quite small.

To gauge our data with the population of SMSFs, we refer to the most recent asset allocation report by the Australian Tax Office (ATO). In its 2014-2015 statistical overview, the ATO reports that asset allocations for cash, domestic shares and property across the whole SMSF sector are 25.60 per cent, 31 per cent and 14.40 per cent, respectively. The allocations to domestic shares and property in our data are relatively similar to the figures from the ATO. However, it is important to highlight that there are some differences in how the ATO and how we classify instruments into

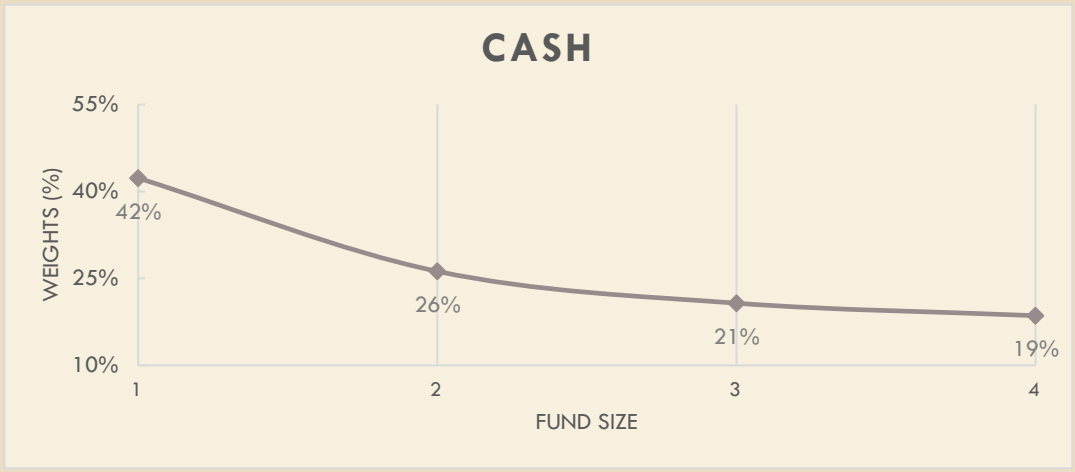
different asset classes. For example, we classify ETFs as domestic shares. This may explain any remaining differences.

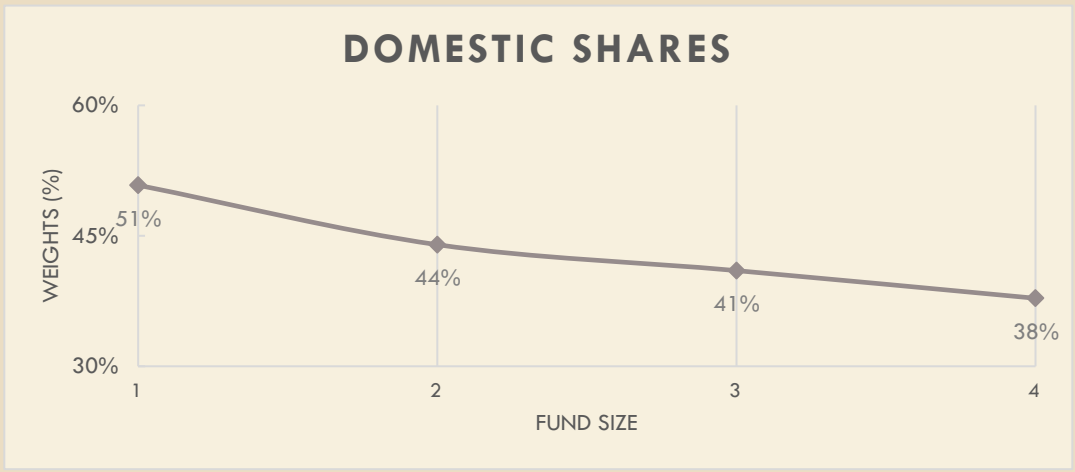
The behavioural factors that we consider in this report consist of gender and the number of trustees. Academic studies have documented that males tend to be more susceptible to overconfident behaviour. Males tend to have unsupported confidence in their intuitive reasoning, judgments, and cognitive abilities. The degree of overconfidence is more pronounced when it comes to investment related tasks. This leads us to expect that funds with more male trustees will exhibit a greater tendency to invest in risky assets, and consequently less in the relatively riskless cash asset class.

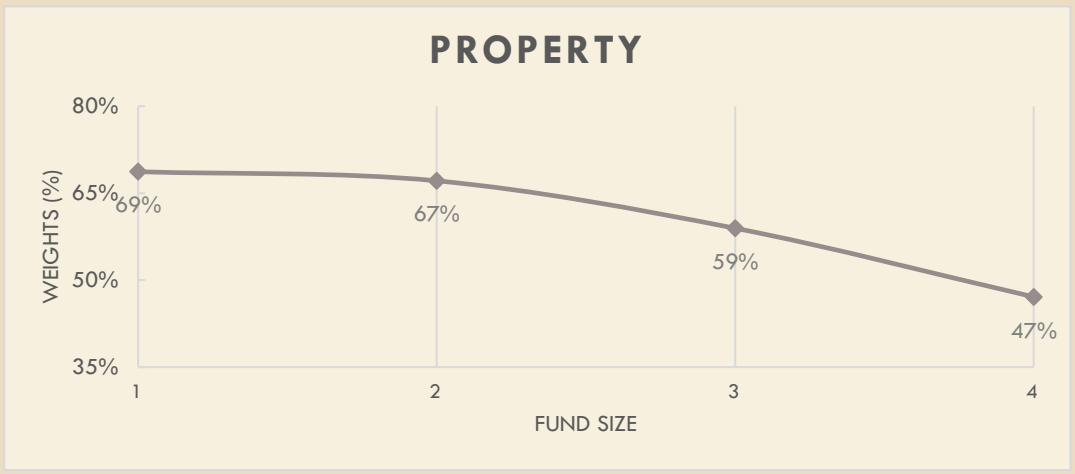
Our second behavioural factor is the number of trustees per SMSF. Studies have shown that individuals behave differently when they make decisions in a group because individuals desire social acceptance. In the context of investing, group behaviour can either exacerbate or counteract the effects of behavioural biases. Specifically, in the context of asset allocation decisions by SMSFs, we aim to examine whether funds with more trustees tend to invest more in safe asset classes and less in the risky asset classes.

Before examining the impact of the two behavioural factors on the asset allocation decisions of SMSFs, we conduct a univariate analysis of asset allocation decisions. This analysis aims to identify any confounding factors that can impact how the behavioural factors affect asset allocation decisions. Our univariate analysis includes fund size and the average age of trustees. Subsequently, we examine the impact of the two behavioural factors on asset allocation decisions for cash, domestic shares and property through panel regressions.

ASSET ALLOCATION ACROSS FUND SIZE







Fund size (1=smallest, 4=largest)

In our previous report we find that large funds allocate their investments across a greater number of asset classes relative to small funds. Given this finding we expect that, without any impact from the two behavioural factors, large funds would on average have lower weights for individual asset classes in their overall allocation. If this is the case then we should include fund size as a control variable.

To examine the impact of fund size on asset allocation, we split our sample funds into four groups based on the value of their assets:

1. Size 1 contains the smallest funds with asset values less than $200,000.
2. Size 2 contains medium low funds with asset values between $200,001 and $500,000.
3. Size 3 contains medium high funds with asset values between $500,001 and $1,000,000.
4. Size 4 contains the largest funds with asset values greater than $1,000,000.

The above categories are based on initially using categories that the ATO applies to split SMSFs (they use seven size-based groups). We then combine several size groups into the final four we use to ensure each size group has a relatively similar number of funds.

The three graphs plot average investment weights in the three asset classes across the different fund sizes. It is clear from the graphs that asset allocation decisions vary greatly across different fund sizes. Smaller funds tend to have concentrated positions in each asset class signifying our initial prediction on the positive relationship between fund size and the degree of diversification. On the other hand, the largest funds display greater variations in their asset allocation as shown by the lower average weight for the three asset classes. Given these findings, we include fund size in our regression analysis to ensure that the impacts of behavioural factors on asset allocation decisions are not driven by fund size.

Age is an important determinant of investment behaviour. Studies have found that investors tend to be more risk averse later in life. However, in the case of multiple trustees we may not be able to capture a clean impact of changing risk aversion on asset allocation decisions. Based on this

reasoning, we include age as a control variable to account for changing investor risk preferences over time.

To examine the impact of age on asset allocation decisions, we calculate the average age of trustees for every fund and then split the sample into funds with average age of trustees below and above 50 (fifty) years old. We then calculate the average weight of investments in cash, domestic shares and property across funds with average trustee age above and below 50 (fifty) years old.

Average Age	Cash	Domestic shares	Property
Above 50 (A)	0.239	0.416	0.533
Below 50 (B)	0.314	0.438	0.647
Difference (A - B)	-0.075	-0.022	-0.114
t Value	-32.89	-7.82	-27.25

The table above shows that funds with average trustee age less than 50 (fifty) years old have a significantly greater proportion of assets allocated to domestic shares and property. This finding supports the view that funds with younger investors are less risk averse and engage in more risky investments. However, the funds with younger trustees also invest more in cash, which goes against our prediction. These findings indicate that trustee age can explain some of the SMSF aversion toward risky asset classes, but does not necessarily also explain all investment attitudes. Given these findings, we include median trustee age in our analysis to ensure that the impacts of our behavioural factors on asset allocation decisions are not driven by trustees changing their risk aversion. Next, we examine the impacts of gender and the number of trustees per SMSF on asset allocation decisions through panel regressions.

BEHAVIOURAL FACTORS AND ASSET ALLOCATION

	(1) Weight in Cash	(2) Weight in Domestic shares	(3) Weight in Property
More male trustees	-0.0336[b] (-4.50)	0.0430[b] (5.33)	0.0325[a] (2.53)
Number of trustees	0.0216[a] (2.52)	-0.0682[b] (-7.48)	-0.0295[a] (-2.29)
Log of fund size	-0.4265[b] (-43.13)	-0.3835[b] (-41.87)	-0.3427[b] (-22.20)
Average age of trustees	-0.0697[b] (-8.58)	0.1380[b] (15.54)	-0.2930[b] (-19.79)
Fiscal year fixed effects	Yes	Yes	Yes
Adjusted R^2	0.0370	0.0330	0.0731

We employ a panel regression methodology in our analysis because it allows for combining the cross section of SMSFs over the observation period. This methodology allows us to take advantage of the longitudinal data set and to capture a more comprehensive picture of how the behavioural factors affect asset allocation decisions.

Our dependent variables in the regressions are the weights of SMSF holdings in cash, domestic shares and property. We transform the weight data into a continuous format[1] because the weight values are bounded between zero and unity and because the regression methodology requires dependent variables to be unbounded. We include fiscal year fixed effects to control for variations in the year-on-year economic conditions over our sample frame and we use robust standard errors to make sure that our inferences on the regression coefficients are valid. We standardize our variables to have zero mean and variance equal to one so that we can compare the relative significance of the estimated coefficients.

[1] We use the following formula to calculate the dependent variable weights for cash, domestic shares and property independently: $Weight = \log\left(\frac{Raw\_weight}{1-Raw\_weight}\right)$. Weight refers to the transformed variable that we use in the regression while raw weight refers to the investment weight we obtain from our data set.

Our independent variables of interest are *More male trustees* and *Number of trustees*. The former is a dummy variable that is equal to unity if a SMSF has more male than female trustees and zero otherwise. The latter is a count variable on the number of trustees a SMSF has. We include *Log of fund size* and *Average age of trustees* as control variables.

Looking at *More male trustees*, we find that SMSFs with more male trustees have smaller holdings of cash (a relatively riskless asset) but greater holdings in risky assets (domestic shares and property investment). These results indicate that funds with more male than female trustees may display greater confidence in their asset allocations by reducing their holdings of riskless assets in favour of more risky assets.

As for the *Number of trustees*, we find that funds with greater numbers of trustees tend to invest more in the riskless asset and less in the risky assets. Funds with more trustees tend to invest more heavily in cash, an asset class which most investors are more familiar with.

Taken together, these results suggest that gender and group behaviour bias work in opposite directions. Lower investments in cash attributed to gender bias get cancelled by group behaviour bias, with the net effect resulting in a reduction in cash holdings over time. These findings match our observation of decreasing cash holdings across SMSFs in our sample. Furthermore, given that the decreasing trend started right after the global financial crisis, the lower cash holdings could be indicative of having greater confidence in their investment abilities. The outstanding performance of the SMSF sector during the global financial crisis may also serve to embolden trustees to invest more in risky asset classes locally. However, SMSF investments in the risky asset classes do not increase by much over the period, likely in part because of the group behaviour bias we document.

CONCLUSION

Using comprehensive SMSF asset data, we identify two complementary behavioural factors which influence how SMSFs allocate their assets. Given the concentration in domestic assets we observe, SMSFs may be prone to home bias. We identify two behavioural factors, namely gender bias and group behaviour, which have significant impact on the way SMSFs allocate their assets. Gender bias leads funds to invest in risky assets when they are comprised of more male trustees. On the other hand, our findings indicate that group behaviour bias may exacerbate home bias. Funds with more trustees appear to prefer safer allocations by investing more in cash and less in risky assets. Taking these behavioural factors together, we can partially explain the decreasing trend in SMSF cash holdings observed, as well as the small changes in funds allocated to domestic shares and property over the previous eight years. Our results are robust to fund size differences as well as the influence of age on the risk aversion level of investors.

Finally, although we do not tabulate it in this report results on an asset-by-asset basis do not reveal any differences in performance across the different behavioural factors that we examine. However, this is not the same as examining the risk-adjusted performance of a fund in its entirety. In a future report we will examine this in more depth.