Determinants of Member Choice in the Australian Superannuation Industry

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Abstract

This study examines the determinants of superannuation members' investment choices across fund families, with a focus on the effect of fund families' performance and marketing effort. Existing literature on managed funds may not be easily generalised to the superannuation fund setting given the distinct attributes and behaviour of superannuation investors. We use an actual decision making measure, member-nominated transfers, to examine those investors who have 'made a choice' at the fund family level. Additional choice measures including member personal contributions, percentage of default assets and number of new members are also used to complement the main measure. Using a unique data set of Australia Prudential Regulation Authority (APRA)-regulated superannuation funds from 2005 to 2014,[1] our results indicate that the asymmetric return-chasing behaviour commonly found in managed funds research does not exist in the superannuation context. Investors do punish bad performers by withdrawing investments. We find a consistent positive relation between marketing efforts and member choice. Further analysis shows this result is mainly driven by retail funds, and is confined to fund families that conduct more extensive marketing.

[1] We thank the Australia Prudential Regulation Authority (APRA) for providing the public and proprietary superannuation data. Peng acknowledges financial support of APRA, the Reserve Bank of Australia and the Brian Gray Scholarship .

1. Introduction

Superannuation is the term used in Australia to describe the setting aside of income for retirement, generally known internationally as pension or retirement products.[2] As defined contribution funds have started to dominate the superannuation landscape, the responsibility for making investment choices has been passed from employers and fund trustees to individual members.[3] Given the economic and social significance of superannuation to individual Australians and the society, it has become ever more important to gain a better understanding of whether and how these mostly novice, small, retail superannuation members manage their retirement investments. This study examines the determinants of member-nominated transfers across superannuation fund families to shed light on the role of fund families' performance and marketing efforts in members' decisions to switch fund families.

We first examine the effect of performance because it is one of the most salient fund features the investor can observe. An extensive line of managed funds literature has primarily focused on performance and found asymmetric return-chasing behaviour among investors. However, findings from managed funds research may not directly map onto superannuation funds in light of the different investor attributes and behaviour.

Mechanisms or conditions that reduce investors' search and information costs facilitate fund flows, because investors tend to purchase those funds that are easier or less costly for them to identify (Sirri and Tufano, 1998, Jain and Wu, 2000, Huang et al., 2007, James and Karceski, 2006). One mechanism to reduce information costs for investors is

[2] Superannuation in Australia is comparable to US401(k)/403(b) plans. The primary difference is that superannuation is compulsory in Australia with a minimum level of contribution set by the government.

[3] There is a widespread trend for employers to replace defined benefit plans (where the fund trustee is responsible for investment risk) with defined contribution plans (where the individual member is responsible for investment risk). In 2014, Australia has 85.4% of assets in defined contribution plans, whereas the US, Japan, Canada have only 58.2%, 2.8% and 4.3% respectively. Sources: Towers Watson, 2015 Global Pension Asset Study, February 2015. https://www.towerswatson.com/en/Insights/IC-Types/Survey-Research-Results/2015/02/Global-Pensions-Asset-Study-2015.

through enhanced fund visibility through marketing, as marketing provides the investor with information about the fund's existence and characteristics. Similarly, the attention (or familiarity) hypothesis implies that marketing has the ability to increase investors' awareness of a fund. With almost full coverage of the workforce, the cohort of superannuation members is much broader and is likely to have a lower level of financial sophistication on average, relative to managed fund investors. These unsophisticated superannuation members on average incur higher information costs when making investment decisions, compared to their managed fund counterparts. The study thus examines whether and how marketing affects superannuation member choices.

To see how investors respond to the strategies pursued by funds, fund flow is widely used in the fund literature. This is because fund flow reflects the choices made by investors, that is, the revealed preferences of investors. Previous studies approximate fund flows using the fractional net flow specification. Yet net flow is less informative in the superannuation setting because a large portion of the new inflows is mandated by the Superannuation Guarantee (SG), and outflows from a superannuation fund consist largely of benefit payments to members in retirement. This means net flow in superannuation is not a precise proxy for member choice. That is, every flow in managed funds represents a decision made by investors, but due to the superannuation contribution and withdrawal rules, only member-initiated fund transfers capture superannuation members' active investment decisions. Therefore, we use the Australia Prudential Regulation Authority (APRA)-reported rollover from one superannuation entity to another superannuation entity after adjusting for flows from winding up funds. The derived member-initiated transfers provide a more precise reflection of superannuation members' active investment choice.

A potential complication facing any fund analysis is the fact that virtually all funds are affiliated with fund families. Superannuation members have two levels of choices

possible. The first is the choice of fund family (or plan) to receive contributions. The second level of choice is the individual fund (investment strategy or option) within a particular fund family. While the effect of family characteristics on individual fund flow has been recognized by prior research, few studies focus on family flow. Although superannuation entities are certainly interested in the level of fund flow to each of their individual funds, they view those funds as a series of products, with the central interest being the aggregate flow to the entire family of funds (Chevalier and Ellison, 1997, Bhattacharya et al., 2013). From investors' perspective, the investment choice usually starts with fund family brand recognition, which precedes fund product selection. Moreover, the relative ease of switching funds within a family (in terms of fees and search costs) suggests choosing a fund family is an important decision before a specific fund is selected (Massa, 2003). In addition, it is the active choices at family level, rather than at individual fund level, that drive the competition and improve overall efficiency of the superannuation system (Australia, 2010). Given the reasons above, this study takes a broader perspective and uses the superannuation fund family as the unit of analysis.

Our results show that performance is not a key determinant of superannuation family inward flows, but bad performance is significantly associated with outflows, suggesting that poor performers need to improve return to avoid outward flows. Marketing attracts superannuation investors into superannuation families, but this effect is limited to fund families with high marketing expense ratios. In addition, this result is driven by retail funds. In other words, extensive marketing does not appear to be a useful strategy for industry funds to attract investors. The results are robust to the use of fixed effects and the adoption of a dynamic-panel Generalized Method of Moments (GMM) estimator (Arellano and Bond, 1991).

This study contributes to existing literature in a number of ways. First, it provides insight into the superannuation investment decisions of average retail investors. A large and growing segment of the superannuation fund market is targeted towards retail clients. Winning new business means capturing members (and their assets) from another superannuation fund family. Hence, evidence on how individual investors hold and switch between superannuation fund families is important for fund managers and regulators. This study also uses a more precise measure of investor choice, the member-initiated transfers at family level, compared to the net flow fractional approximation used in prior literature. In addition, this study is consistent with the spirit of the government's 'Choice' policy, which encourages superannuation fund members to exercise choice among fund families. Understanding the determinants of fund family flow precedes that of fund flow. Findings on the determinants of flows at the family level can help superannuation fund families to better understand the members they serve and form family strategic decisions accordingly. Finally, our empirical analysis using the universe of Australian regulated-superannuation funds improves upon typical retirement saving studies, which rely on small and specialized datasets using surveys or experimental research design.

The remainder of this study proceeds as follows. Part 2 introduces the institutional background of the superannuation industry. Part 3 reviews the relevant literature and proposes hypotheses. Data and empirical methodologies are described in Part 4. Results and robustness tests are discussed in Part 5. Section 6 concludes the paper.

2. Institutional Background

2.1 Australian Superannuation

Australia's three-pillar retirement funding system consists of mandatory superannuation contributions by employers under the government's Superannuation Guarantee (hereafter

SG), supplementary voluntary contributions by employees to superannuation accounts, and the government-funded age pension.[4] Due to incremental privatization of the system, superannuation has turned into Australians' principal retirement savings vehicle. Those who have insufficient superannuation balances will be covered by the means- and income-tested age pension. Yet the public age pension (with the maximum level set at 25% of average weekly earnings) is meant to be a bare minimum, or a 'safety net' to supplement superannuation, not to be an alternative.

The cornerstone of the Australian superannuation system is the compulsory superannuation contribution system, known as the 'Superannuation Guarantee' (SG), where employers are mandated to make superannuation contributions on behalf of their employees at a proportion of their salaries and wages. This money is withheld from employees' compensation and directed to the employees' nominated superannuation funds. To ensure adequate retirement savings for the ageing population, the SG levy was gradually increased to 9.5% of an employee's compensation in 2009 from 3% at its inception in 1992. Beginning in July 2013, a gradual increase to 12% is proposed by 2025.[5,6] In addition, tax incentives and government co-contributions are also in place to encourage voluntary superannuation contributions.[7] When the SG was introduced in 1992, the superannuation system held just under $150 billion in assets. Superannuation assets then increased rapidly over the past few decades, reaching $2.05 trillion as of June 2015, which approximate the size of Australia's GDP (APRA, 2015). By 2032, on current projections, superannuation assets are expected to

[4] Individuals can make extra voluntary salary sacrifice and member top-up contributions to their superannuation accounts. Low income earners are encouraged to contribute through the government's co-contribution scheme.
[5] The compulsory Superannuation Guarantee is comparable to an auto-enrolment 401(K) plan in the US.
[6] Source: http://www.ato.gov.au/rates/key-superannuation-rates-and -thresholds/?page=23#Super_guarantee_percentage.
[7] Superannuation is the most tax-effective vehicle for retirement saving. Contributions, earnings and capital gains are concessionally taxed at 15% (10% capital gains tax applies to assets held for more than 12 months), instead of the investor's marginal tax rate. More importantly, under reforms introduced in July 2007, superannuation benefits withdrawn after age 60 are tax free.

reach $7.7 trillion.[8] This superannuation system has turned Australia into a 'shareholder society', where Australians have more money invested in managed funds per capita than any other economy.[9]

Australian superannuation funds are grouped into four categories. Fund features differ in each category. Retail funds are open to the public to join and are operated commercially by financial institutions and fund managers. Profits are transferred to and retained by the funds and so these funds are operated on a "for-profit" basis. Industry funds are operated by employer associations or unions, and are often nominated as default funds for employers who do not operate their own fund. These funds were originally set up for employees working in a particular industry. Many industry funds are now public-offer funds and can offer membership to the general public. Corporate funds are sponsored by a single private sector employer or a group of similar employers for their employees. Public sector funds were created for employees of governments or statutory authorities. These latter three fund types are operated on a "not-for-profit" or "profit for member" basis.[10]

2.2 "Choice of Fund" Policy

Along with the tremendous growth in the superannuation industry, the government's policy framework has also undergone structural transformations. When the SG was first enacted there were few opportunities for members of employer-based superannuation schemes to choose which fund family would receive their workplace contributions. Most employees

[8] Estimate by research firm Rainmaker assuming growth rate of 9% per year.

[9] Australia's superannuation funds have enjoyed explosive growth at 11.7% per annum over the 10 years to 31 December 2014. This growth rate is among the fastest of 16 major pension fund industries studied by Towers Watson. Sources: Towers Watson, 2015 Global Pension Asset Study, February 2015. https://www.towerswatson.com/en/Insights/IC-Types/Survey-Research-Results/2015/02/Global-Pensions-Asset-Study-2015.

[10] A fifth category of funds, self-managed superannuation funds are generally established by a small number of individuals (up to 4 members) with larger amounts of superannuation assets or by family groups. These funds are subject to different regulations and their data is not publicly available. As such, they are beyond the scope of this study.

were compelled to join the fund chosen by their employer or set out in the relevant industrial agreement.[11] Moreover, most funds did not offer members a menu of investment strategies.

From 1 July 2005, the implementation of the Superannuation Legislation Amendment (Choice of Superannuation Fund) Act 2004 (Commonwealth) means that many Australian employees are able to nominate a fund family for SG contribution.[12,13] Investors can exercise their right to choose from over hundreds of fund families. At the same time, regulatory change improved portability, allowing balances to be rolled over between fund families more easily. Over time, product diversity within fund families was also changed to promote greater choice and flexibility for members.

Funds strive to maximise assets and increase market share because fund sponsors are usually compensated at a percentage of assets under management (Khorana and Servaes, 1999, Gaspar et al., 2006, Gordon et al., 2013). As the asset base grows, funds also enjoy the benefits of economies of scale. In the superannuation context, this incentive is further amplified by the persistence in superannuation fund flows, as investors regularly contribute to the fund and cannot withdraw their investments until the preservation age, early death or disability. Even at a time when capital was scarce worldwide (the 2008-2009 financial year), the superannuation industry continued to thrive.[14]

Despite the proliferation of fund families and products, there appears to be strong investor inertia. That is, superannuation members have a strong propensity to stay with the

[11] Before the 'Choice of fund' legislation, a degree of fund choice did exist with some employers. For example, in Western Australia choice of fund was legislated for employees under state based awards through the Industrial Relations (Superannuation) Regulations 1997 Act.

[12] For example, investors can change fund family if their current fund family is not available with a new employer, consolidate superannuation accounts to cut costs and paperwork or change to a lower-fee, better performing, better service superannuation fund family.

[13] Choice of Fund Policy applies to all employees who are eligible for SG contributions, with the exception of those whose superannuation is paid under state awards, or state industrial agreements, and members of certain public sector funds and defined benefit plans.

[14] There was still approximately $2.2 billion flowing into superannuation funds weekly during the GFC. Source: DUNN, J. 2012. Footy, meat pies and super... *Wealth.*

default fund family and fund. The proportion of superannuation account balances transferred before and after the 2005 Choice legislation was relatively unchanged at approximately 5-7% of total superannuation assets per annum (Fry et al., 2007, Gerrans, 2012). Nevertheless, the switch rate mentioned above still involves huge sums of money and constitutes a multi-billion dollar business. Furthermore, the examination of member choice is motivated by recent survey evidence, which suggests that there is less default behaviour than expected. Gordon et al. (2013) survey 1031 members on their default behaviour. More members described themselves as active choosers than the authors expected. Only 36% of their sample stayed in the default at both fund family and fund levels, meaning that 64% made at least one active choice. Also, around one-quarter of members in the default family and 9% of fund defaulters deliberately choose the default option. So the proportion of completely passive defaulters in their sample is probably below one-third. In a similar vein, survey results from Butt et al. (2015) also suggest that although defaults are influential, they are not overriding.

The Australian government initiated a low-cost and simple superannuation fund product called MySuper in 2011 for employers to choose as their default fund. However, even a well-chosen default may be undesirable if members have heterogeneous needs (Carroll et al., 2005). For example, a young and cash-strapped member and an older member who needs to quickly build a retirement nest egg will differ in their interests in superannuation arrangements and risk preferences. The purpose of libertarian paternalistic retirement saving policies such as MySuper should be to mitigate costs for passive investors without encroaching free-choice in the market (Benartzi and Thaler, 2001, Choi et al., 2002). Carlin et al. (2013) argue that the loss of social learning due to people relying on defaults and not acquiring and sharing useful information can be damaging to society as a whole. Active choices are socially optimal when consumers have highly heterogeneous savings preferences and a strong propensity to procrastinate (Carroll et al., 2005). These reasons further motivate

this study's investigation of the determinants of active choices made by superannuation members.

2.3 Differences between Managed Funds and Superannuation Funds

Although there is an extensive literature on managed funds, its results is unlikely to be generalizable to the superannuation funds because superannuation funds differ from managed funds in various ways in terms of investor attributes and their decision-making process. First, contribution to superannuation is compulsory under the Superannuation Guarantee (SG) for almost all working Australians, whereas investment in managed funds is at the investors' discretion. This means that managed fund investors voluntarily make a decision to invest in managed funds, so their investment decisions are more likely to be informed decisions after studying information about the funds. These investors are also expected to be more actively engaged in monitoring and managing their investments compared to superannuation investors for whom the investment process is largely passive. As such, managed funds investors may not be representative of the retail investor population at large. Australian employees are mandated by law to have a certain percentage of their compensation deducted by employers and invested in a superannuation fund, often in a default option of a default fund family chosen by their employer with a prescribed investment horizon. As members cannot access benefits until retirement, they tend to be less attentive to these locked-in savings or discount them excessively. Employees generally can have contributions directed to only one family, while managed fund investors can easily invest in multiple families at the same time. Thus superannuation investors tend to 'set and forget', which results in less active engagement in their superannuation investments.

2.4 Fund Families

Managed funds are not stand-alone entities. Most of them are members of fund families. A fund family is the collection of all funds managed by the same sponsoring management

company. The family structure brings economies of scale and makes decisions in allocating resources.

Although fund families offer a large range of products that can differ significantly in returns, fund returns are more closely correlated within, rather than between fund families (Elton et al., 2007). The increased correlation is attributed to overlapping stock holdings and similar exposure to economic sectors or industries. Hortacsu and Syverson (2004) find a significant positive correlation between flows into the S&P 500 fund and the performance of the non- S&P 500 funds in the family, which is consistent with their pre-assumption that performance spillover exists in the family setting. It is also widely documented that the superior performance for individual funds has star spillover effects (Nanda et al., 2004, Warner and Wu, 2011), whereby other funds in the same family also enjoy increased fund flows. Hence, the family structure under which constituent funds share the same research analysis and prescribed investment style justifies this study's focus on family performance.

Previous research suggests mutual fund families use family-level strategies to maximize overall family benefits. Gaspar et al. (2006) find fund management companies actively pursue a direct family strategy of cross-subsidizing the performance of high value funds (i.e. those more likely to generate fee income or extra investment inflows) at the expense of low value funds. Assets exhibit stickiness within the fund family, i.e., investors are reluctant to withdraw funds from the fund family. Accordingly, fund families expand fund offerings as a way to retain assets. Massa (2003) and Khorana and Servaes (2004) argue that fund families can employ category proliferation as a way to countercompetition and increase market coverage. Product differentiation is also a tool for exploiting star spillover effects, since fund families are well rewarded in terms of new cash inflows for producing stellar funds. Khorana and Servaes (1999) find families with star funds tend to expand product lines. Mamaysky and Spiegel (2002) develop a model of mutual funds in which fund

families do not specialize, rather the optimal strategy is for the families to offer their products in more diversified fund categories. As a matter of random luck, having more funds in a fund family will increase the likelihood of having at least some stellar funds in the family (Nanda et al., 2004). Previous studies also look at fund family product policies (Mamaysky and Spiegel, 2002, Siggelkow, 2003, Khorana and Servaes, 2004) and advertising decisions (Gallaher et al., 2006). Since marketing decisions are coordinated at the family level, this study also uses superannuation fund family as the unit of analysis.

3. Literature Review and Hypotheses Development

3.1 Behaviour of Defined Contribution Plan Members

Theoretical models in prior research such as the mutual fund literature typically assume a significant degree of investor sophistication and learning ability (Berk and Green, 2002, Lynch and Musto, 2003, Huang et al., 2007, Dangl et al., 2008). However, in realistic environments, an overwhelming weight of empirical evidence suggests that the average pension participants display low levels of financial literacy and investment savvy in their financial matters. Several studies have highlighted the behavioural biases and financial literacy constraints that hinder decision making, showing for example that pension participants use naive asset allocation strategies and exhibit inertia in rebalancing (Benartzi and Thaler, 2001, Agnew et al., 2003, Huberman and Jiang, 2006); and are subject to framing and default effects in investment options (Benartzi and Thaler, 2001, Karlsson and Nordén, 2007). The observed investor apathy toward superannuation investments is likely partially due to the nature of the clientele of superannuation funds: largely retail investors with limited financial sophistication and cognitive biases in decision-making.

On the other hand, two streams of studies support the notion that large changes in retirement savings behaviour can be motivated simply by the power of suggestion. Madrian

and Shea (2000), Choi et al. (2002) and Choi et al. (2005) show that automatic enrolment in a 401(k) plan dramatically increases participation and contribution rates. These studies imply that that many employees interpret the default option as investment advice on the part of the company. Duflo and Saez (2002) highlight the role of social interactions on retirement savings decisions, their evidence suggests that peer effects have a strong influence on the decision to participate in retirement plans.

3.2 Flow-performance Relation

A convex flow-performance relation at individual fund level is a well-documented phenomenon in mutual funds literature where investors flock disproportionately to recent winners, but do not punish poorly performing funds proportionately by withdrawing their investments (Gruber, 1996, Chevalier and Ellison, 1997, Goetzmann and Peles, 1997, Sirri and Tufano, 1998, Lynch and Musto, 2003, Huang et al., 2007). Such asymmetric flow-performance relation is commonly found among retail investors as they infer managers' skill or future performance from past performance, and chase after superior performance in a simplistic way Bailey et al. (2011) and Navone (2012) demonstrates that inexperienced retail investors rely heavily for their allocation decisions on a fund's past performance when other information (such as expense) is harder to come by. Huang et al. (2012) use the dampening effects of performance volatility and fund age on the flow-performance sensitivity to infer the relative level of sophistication among mutual fund investors. Volatility of performance introduces noise to investors' learning process whereas longer track records enhance informativeness. Consistent with the idea of Bailey et al. (2011), Huang et al. (2012) hypothesize that the dampening effects on the flow-performance sensitivity is stronger for funds with more sophisticated investors. They compare load versus no-load funds, institutional versus retail funds, and star versus non-star funds, and find evidence supporting this investor learning hypothesis. However, in the context of superannuation funds, the

average member tends to be naïve investors without superior investment knowledge, so that heightened sensitivity is expected under superior performance.

In contrast, some recent studies show the fund flow-performance relation for pension funds tends to be flat due to clientele differences. Sialm et al. (2012) find that defined contribution plan participants neither invest more in high performance funds nor significantly pull out of low performance funds. They show that the flow-performance sensitivity documented in the past is driven primarily by the plan sponsors' actions in adding and deleting funds on the plan menu. Using a dataset covering savings in Sweden's Premium Pension System, Dahlquist and Martinez (2015) find pension investors do not seem to react to past fund performance due to inattention and inertia.

Whether family flows are associated with past family performance in the superannuation context remains unexplored. To address this question, this study examines the nature of the performance-flow relation for superannuation fund families, stated in the the null form.

Hypothesis 1: *There is no flow-performance relation in superannuation fund families.*

3.3 Information Cost, Marketing and Fund Flows

The second research question examines marketing effort as a method superannuation fund families can use to reduce superannuation members' information search and processing costs in order to attract fund flows. Studies of mutual funds often recognize the information barrier investors encounter in allocating their investment among mutual funds. Sirri and Tufano (1998) and Huang et al. (2007) argue that fund flow should be related to the mutual fund investors' search costs. Information search and processing costs affect investors' ability to acquire information and partially determine the extent to which investors are informed. Hortacsu and Syverson (2004) examine the retail S&P 500 index funds segment, where all

funds are characterized by nearly homogeneous return patterns, and find that this sector exhibits large share price dispersion (i.e., these companies are priced very differently despite their homogeneous return patterns). To address this puzzle, they highlight possible roles of informational (or search) frictions that deter investors from finding the fund offering the highest utility, and suggest the influx of novice mutual fund investors during their sample period underlies the observed shift in sector assets to more expensive funds. It is worth noting that they assume these novice investors are typically those with high information costs, which links back to the discussion in the previous section on unsophisticated investors.

In the presence of demand for information and substantial information costs, mechanisms or conditions that reduce information search and processing costs have a material impact on consumer fund choices. Several papers infer that advertising efforts reduce consumer search costs and facilitate fund flows (Jain and Wu, 2000, Gallaher et al., 2006, Korkeamaki et al., 2007). Some previous mutual fund studies have examined the relation between individual fund flows and proxies for advertising of those funds. For example, Sirri and Tufano (1998) use total fees charged as a proxy for marketing and distribution expenditures. They find no relation between the flow-performance relation and this proxy, except in the case where they separate the mutual funds into those with high fees and those with low fees. In that case they find that funds with higher fees, which the authors assume are funds with greater marketing efforts, have greater flow-performance sensitivity. However, because they are forced to employ a coarse proxy for marketing efforts, they cannot ensure that their results are not caused by confounding factors, such as funds with higher service levels (associated with the higher fees) attracting greater flows. Jain and Wu (2000) use a dummy variable approach to compare fund flows of individual mutual funds that have advertisements in one of two magazines in a month to flows of funds without advertisements in these magazines. Over their July 1994 through June 1996 sample period,

they find that the advertised funds have higher net inflows, after controlling for prior performance, lag flows, and size. Cronqvist (2005) examines a number of issues with the advertising of the Swedish 401(k) type funds, including what funds advertise and which types of advertising, affect the investors' allocation choices, and whether fund advertising is a signal of future performance. These studies have focused on the role of advertising in individual funds, but it is important to keep in mind that the advertising expenditure decision is a fund family decision, not an individual fund decision. Thus, we test the hypothesis of whether advertising affects flows at the fund family level using more precise measures of marketing expense and fund flows.

Marketing is potentially an important mechanism for superannuation funds/members due to the members' passivity/inertia so that a way to force brand recognition and provide information is via marketing. The role of marketing is likely an important one given that superannuation members are unsophisticated and passive (i.e. they are less likely to actively do extensive research of superannuation funds to make switching decisions, relative to mutual fund investors). Repeated messages provided by advertisements are likely to attract their attention and make their information search/processing decisions easier. Thus this study examines whether there is a positive relation between marketing and superannuation fund flows. To the extent that a mandatory superannuation system will increase coverage of those with lower financial literacy, we may expect to a stronger relation between marketing and fund flows for superannuation funds.

Hypothesis 2: *Marketing is positively associated with fund family flows*.

4. Data and Methodology

4.1 Data Source

The Australian Prudential Regulation Authority (APRA) supervises regulated superannuation funds in Australia, Approved Deposit Funds and Pooled Superannuation Trusts, all of which are regulated under the *Superannuation Industry (Supervision) Act 1993*.[15] The first data source is the APRA Superannuation Fund Level Profiles and Financial Performance statistical publications, from which we obtain the investment rollovers, and other superannuation fund family characteristics including marketing expense, rate of return, number of investment options, member age segmentation, personal/employer contributions and proportion of default asset.[16] APRA collects these data from mandatory periodic Superannuation Reporting Forms (SRFs) submitted by APRA-regulated superannuation fund families. The sample period spans from 2005 to 2014 when the 'Choice' policy is in place. The terms 'fund' and 'product' used in APRA's publications correspond to 'fund family' and 'fund' in common usage. To be consistent with the mutual fund literature, we use the latter terms throughout this study.

Considering the significant consolidation in the superannuation industry over the past decade, we need to adjust for successor transfers, based on the information reported in the proprietary SRF 250.0 Superannuation Entity Profile. We identify the winding up entity's name, date of wind up, and the successor entity from section 4 of this form. Other proprietary data provided by APRA includes number of new members and break-down of expense items from a series of reporting forms.

[15] Self-Managed Superannuation funds are supervised by the Australian Taxation Office.

[16] Some items in the public publications are masked for privacy reasons. The full dataset is offered by the APRA to perform the analysis in this study.

4.2 Sample Selection Process

The sample selection process is reported in Table 1. The initial sample consists of 4166 superannuation fund family years from 2005 to 2014. Corporate, industry and retail families together account for almost 95% of total observations. We begin our sample selection by eliminating non-public offer families. Public offer superannuation fund families are open to the public to join, and they promote competition in the industry by providing alternatives for members choosing superannuation fund families. This step results in the exclusion of 94% of corporate families, 40% of industry families, and 80% of public sector families from the sample. The majority of retail families are public offer families, as only 335 out of 1963 retail families are non-public offer ones. We delete exclusively Defined Benefit (DB) families, because DB members are not responsible for managing their own investments and DB plans are not as portable as Defined Contribution (DC) plans. Most superannuation fund families have a year-end of 30 June. We remove a number of superannuation families with year-ends other than 30 June to provide a consistent basis for comparison. Observations with missing or erroneous values (e.g. negative inward rollover) are deleted. The final sample consists of 1802 fund family years from 2005 to 2014. Over half (67.5%) of these families are retail superannuation families. The second largest type is the industry superannuation families, which accounts for 19.6% of the sample.

4.3 Regression Model Specification

Determinants of superannuation investment rollovers are examined using the following regression model. The regression variables are discussed in more detail in the next few sections and variable definitions are also provided in Table 4.

$$ChoiceMeasure_{i,t} = a + b_1 MktExp_{i,t} + b_2 Perf_{i,t-1} + b_3 LnTNA_{i,t-1} + b_4 InvOpt_{i,t} + b_4 Above50_{i,t} + \varepsilon_{i,t} \quad (1)$$

where the $ChoiceMeasure$ is one of three fund flow measures (Net Rollover, Inward Rollover and Outward Rollover) of APRA-reported transfers among superannuation entities. *MktExp* is the marketing expense ratio as proxied by other operating expenses. For performance ($Perf$), we use the APRA-reported family return. $LnTNA$ is the natural logarithm of total net asset under management. $InvOpt$ stands for the number of investment options/funds within the fund family, and $Above50$ is the proportion of members above the age of 50.

4.4 Dependent Variable: Member-initiated Family Rollover

Not having access to exact fund flows, previous managed fund studies approximate net flows using fund total net assets and fund returns as follows (Sirri and Tufano, 1998, Del Guercio and Tkac, 2002, Chevalier and Ellison, 1997):

$$NetFlow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1}(1 + R_{i,t})}{TNA_{i,t-1}} \qquad (2)$$

where $NetFlow_{i,t}$ is the net flow growth for fund *i* during year *t*; $TNA_{i,t}$ is the total net asset of fund *i* in year *t*; $R_{i,t}$ is the return of fund *i* at time *t*.

The application of this measure to the superannuation setting is problematic due to its failure to isolate Superannuation Guarantee (SG) mandated contributions (which leads to a high autocorrelation in the flows) and payments of member benefits, both of which are not member-initiated investment decisions.

This study therefore uses APRA-reported investment rollovers, which are transfers between APRA-regulated superannuation entities. This means the inward rollover does not include amounts that are new to the superannuation system, e.g., the mandatory contributions under SG. Similarly, the outward rollover excludes benefit payments. We then remove inward rollover from winding up families, using the outflow of those leaving the industry in the year they wound up. If that data is not available, we use assets of those superannuation fund families in the year prior to wind up. This allows us to separate flows nominated by employers or trustees.

Admittedly, investors who switch fund families may do so because of changing jobs (Fear and Pace, 2008). While the change of employer cannot be controlled for due to lack of data, job change actually provides a chance for investors to make an active choice whether to switch their fund family. In addition, the APRA-reported rollovers include transfers due to job change only when the member decides to consolidate existing superannuation balance into the new employer's default superannuation fund family. In this case, the investor has made an active investment choice.

4.5 Alternative Member Choice Measures

To complement the main member's choice measure, we also use alternative measures including employee's personal contribution, proportion of assets in the default investment option and the number of new members. Member personal contribution is voluntary after-tax superannuation contribution, which includes contributions from both new and existing members. The proportion of default asset can be used to examine the level of active choice made within the fund family to see the proportion of members who opt for a passive (i.e., just using the default option) or active investment style. The number of new members represents the number of personal and employer-sponsored members who joined the superannuation fund family during the financial year.

4.6 Fund Family Performance

The fund family performance measure used in this study is the APRA-reported rate of return, which is calculated as a fund family's net earnings after tax divided by cash flow adjusted net total assets under management. As opposed to individual fund return, this family return measures the combined earnings of superannuation assets towards fund members' retirement benefits in a superannuation fund family. *The Superannuation Industry (Supervision) Act 1993* requires that superannuation trustees must "formulate, and give effort to, an investment strategy that has regard to the whole of the circumstances of the entity and in the best interest

of its members". APRA claims its rate of return is a useful measure to assess a superannuation trustee's ability to deliver on the fund's investment strategy for the benefit of all members over time (APRA, 2013). In addition, the APRA-reported return is widely used by superannuation disclosure documents (such as product disclosure statement and member statement) and superannuation comparison websites such as SuperGuide [17] and SuperRatings[18]. It is therefore expected to be observed and used by investors when they select superannuation fund families. To avoid concerns relating to reverse causality, we follow Sirri and Tufano (1998)'s approach of using the family returns over the preceding year for regression analysis.

4.7 Marketing Expense

Various measures have been utilised to capture a managed fund's marketing effort and its impact on fund flows. Khorana and Servaes (2004) and Barber et al. (2006) measure marketing expenses at the individual fund level through 12b-1 fees. Sirri and Tufano (1998) and Huang et al. (2007) use a fund's total fee ratio, defined as the annual expense ratio plus one-seventh of the up-front load fees. Jain and Wu (2000) find that an advertisement in one of two business periodicals is associated with larger flows to the advertised managed fund than to a matched fund in a control group. Gallaher et al. (2006) examine the effect of monthly print advertising expenditures of mutual fund families over the 1992-2001 period on investment flows.

Marketing decisions originate on the fund family level, so we use superannuation fund family as the unit of observation for marketing activities. A closer examination of the expense items in SRF200 reveals that marketing expense is reported under "operating

[17] See http://www.superguide.com.au/.
[18] See http://www.superratings.com.au/.

expenses".[19] As fund advertising has no persistent effect (Gallaher et al., 2006), we use current operating expense as a proxy for marketing expense in this study.

4.8 Control variables

We also include several control variables that are likely to affect investor choice in the regression. Fund family size reflects economies of scale and scope. We take the natural logarithm of *TNA* (total net asset) to represent brand recognition and resources controlled by the family. Again, to account for endogeneity concerns, the previous year's value of *TNA* is used. The natural logarithm of the number of investment categories available to members is used because a greater variety of investment options is expected to attract a broader set of members who have different performance targets and risk appetites. The proportion of members above the age of 50 is included given anecdotal evidence that investors approaching retirement age are more aware of and more engaged in their superannuation arrangements. They are more likely to make active switching choices, and thus affect fund flows. Family type and year fixed effects are also controlled for.

5. Results

5.1 Summary Statistics

Given this study is the first empirical investigation of this kind, we first present some descriptive statistics to provide a better understanding of Australian superannuation fund families. Table 2 provides a breakdown of the sample for each year. Over time, the number of superannuation fund families has decreased, which reflects the trend of consolidation in the superannuation industry. The consolidation together with new contributions results in the growing family size (measured by TNA). Marketing expense is a proxy for superannuation fund family's visibility to the public. This amount increased from the adoption of 'Choice' policy in 2005 until 2008, and fell in 2009 and 2010 before it picked up again in 2011. The

[19] This is checked and confirmed with the APRA statistics team.

number of investment options has increased dramatically since 2005 and has stayed over 100 since 2009. Net rollover is not 0 due to restrictions applied in the sample selection process. Generally speaking, the inward rollover is around 7-8% of asset under management. Fund family returns coincide with economic cycles (with negative returns in 2008, 2009 and 2012).

Panel A and B in Table 3 provide summary statistics for retail and industry superannuation fund families respectively. The consolidation of fund families in the full sample seems to be driven by retail superannuation fund families, whereas the number of industry fund families increases in the same period as more of them are becoming public-offer families. [20] The average size of industry families is larger than their retail counterparts. The performance of industry families is better, except for year 2008 and 2009, which suggests higher volatility. Industry families spent more money on marketing than retail families in terms of both the absolute dollar amount and the expense ratio (divided by total net assets). Many more investment options are offered in retail families. Retail families provide around 300 options on average while industry families provide approximately 13 options. The amount of both inward and outward rollovers is greater for retail families, which suggests more active choices are executed.

5.2 Effect of Performance

While the term 'chasing performance' has no standard definition, it is loosely used to mean that investors gravitate to high-return investment strategies. Gruber (1996) and Sirri and Tufano (1998) propose that investors infer managerial skill from past returns and, therefore, chase returns. While such performance chasing behaviour generally holds at the individual

[20] A quick analysis from the supply side reveals that, despite the significant consolidation in the industry (the number of superannuation funds decreased by 91% from 3,720 in June 2001 to 336 funds in June 2012), the level of industry concentration measured by Herfindahl-Hirschman Index (HHI) is as low as 2.7 %. No single superannuation fund has a dominant market share of more than 4%. The largest five funds by assets in 2012 comprised 16% of the market share of the superannuation industry. By comparison, the four major banks comprised around 79% of banking industry assets in June 2012. This suggests that there are still a large number of funds competing for members' business.

fund level for mutual funds, much less is known about family performance in the superannuation context.

The first column from Table 4 shows a statistically significant and positive relationship between fund family performance and net rollovers, providing evidence of a positive flow-performance relation at family level in the superannuation industry. Similar results are found for the sub-samples of both retail families and Industry families. However, after partitioning the rollover into inward and outward rollovers, we find no statistical significant relation between performance and inward rollover but a negative association with outward rollovers. This can be explained by the passive investment style of superannuation investors and the long-term nature of their investment. Dahlquist and Martinez (2015) infer that pension investors face a greater risk of being caught in poorly performing funds due to their inattention to past performance. However, in our analysis superannuation members do punish families with bad performance by directing investments to other families. Members can be inattentive to their superannuation investments until bad performance cues that a change is needed. This is consistent with the change theory that investors will only alter their choice when experiencing conflict with their current situation.

5.3 Effect of Marketing

Table 4 shows a strong positive relation between marketing expense and net rollover, which suggests that investors pay attention to marketing when selecting a family in which to invest funds. Most superannuation investors have no formal financial training. There are thousands of funds for investors to choose from, far more than any investor can carefully consider. The significant positive relation between marketing and net rollover supports the premise of this study that marketing helps attract investors' attention as these fund families are easier or less costly for investors to identify.

Next, when net rollovers are divided into inward rollovers and outward rollovers, we find that marketing expense increases inward rollovers but does not have a significant impact on outward rollovers. As the information costs of new investors are higher than that of existing members, enhanced visibility produced by marketing efforts attracts more inward rollovers, but does not affect the existing members to the same extent.

The above analysis shows that fund families with high marketing expenses attract more investment rollovers. We then explore whether this relation applies to different types of fund families. We re-run the tests for retail and industry fund families respectively, as these two types of funds account for the majority of our sample families. Similar results are found for the retail superannuation fund family sub-sample. As for industry families, despite the fact that they spend more on marketing compared to retail families (Table 3), the relationship between marketing and fund flow is not significant. In summary, retail or for-profit funds are responsible for driving the significant positive relation between marketing and inward rollover for the overall sample. No significant effects are found for industry funds. One possible explanation is that although these industry families are public-offer ones, investors may not to be able to join unless they belong to certain industries. The results suggest the higher amount of marketing expenditure incurred by industry families does not appear to attract eligible members to switch fund families.

5.4 Control Variables

Turning to other control variables, size is often used to proxy for economies of scale in raising fund visibility. We find no statistically significant relation between family size and rollovers. Industry fund investors are less likely to leave the family if the family is larger in size. Superannuation families can employ category proliferation to limit competition and increase market coverage. Yet the number of products offered only has a weak impact on the net rollover for all families (column 1 of table 4). The results also show that members above

the age of 50 are generally more active in terms of both inward and outward rollovers (for all families and retail sub-sample). This is in line with the survey evidence of Gordon et al. (2013) and Butt et al. (2015) that members are more likely to make choices as account balances increase and retirement approaches. In contrast to retail families, a significant negative coefficient is shown for industry families in the outward rollovers column. A possible explanation for this is that members above 50 are less likely to move industry.

5.5 Alternative Choice Measures

In this part of the analysis, we revisit the determinants of investor choice using alternative dependent variables including personal contribution, proportion of default asset and number of new members. This analysis is used to complement the main analysis as these measures are not pure choice measures that capture active switching decisions. For example, both the personal contribution and the percentage of default asset fail to disentangle the effect caused by existing and new members. The percentage of default option reflects choice at individual fund level. The number of new members includes those automatically enrolled by their employers. However, these alternative measures may still provide interesting supplementary evidence for the level of investor engagement.

The results from Table 5 indicate little relation between performance and all choice measures. Marketing leads to more personal contributions. In addition, we also test employer contribution. Results from column 2 in Table 5 show no significant coefficients. This is because employer contribution is determined by wages and salaries, and does not represent the choices made by investors. This also supports our argument that the traditional net flow approximation is not an appropriate choice measure. The proportion of default asset decreases as marketing expense increases. This result carries two potential implications: those more active investors are less likely to choose the default option, or marketing can also encourage existing members to make active switching choices within the fund family. The

effect of marketing is further supported by its positive and significant relation with the number of total new members. When we split the sample into retail and industry fund samples, results from Table 6 are similar to the main results discussed earlier.

5.6 Further Analysis on the Effect of Marketing

Gallaher et al. (2006) find that advertising affects fund flows in a non-linear fashion with convexity at the upper end. Sirri and Tufano (1998) find that if funds spend higher fees, which they assume are funds with greater marketing efforts, then investors are more sensitive to the fund's salient features. Thus we employ a specification that allows for this non-linear relation. We normalize marketing expense on a [0,1] interval analogous to the Sirri and Tufano (1998) normalization procedure. The fractional rank for superannuation fund families in the bottom marketing expense quintile (*LowMkt*) is defined as min(*MktExp*, 0.2). Families in the three medium marketing expense quintiles (*MidMkt*) is defined as min(*MktExp – Low*, 0.6). The rank for the top quintile (*High*) is defined as *MktExp – MidMkt – LowMkt*. For example, a fund family in the 10th percentile would experience flows of $0.1 \times b_1$ if all the other covariates were equal to zero. On the other hand, a fund family in the 90th percentile would experience flows of $0.2 \times b_1 + 0.6 \times b_2 + 0.1 \times b_3$ if all the other covariates were zero. A two-kink continuous piecewise-linear specification is then used in the manner of Sirri and Tufano (1998) and others, which allows for different flow-marketing sensitivities at different marketing expense ranges. Earlier results from Table 4 show that marketing expense is associated with inward rollovers for retail families. The results from Table 7 highlight a non-linear relationship where families with high marketing efforts enjoy disproportionately large money inflows. That is, the magnitude of the flow coefficient on the top advertiser's marketing expense is substantially larger. For example, a 10 percentile increase in the marketing expense rank increases the net flow by 8.62% for the top quintile. On the other hand, those families in the middle range of marketing expense ratio show smaller outflows.

The fund families who spend the least have no significant relation between their marketing expense and fund flows. High relative levels of advertising are significantly related to high flows for retail families. Therefore, it appears that for marketing to matter, the fund family must ensure that it is one of the top advertisers on a relative basis.

A threshold of marketing expenditures relative to competitors' marketing expenditures exists before the marketing has significant effects on flows into the family. Given that the results indicate marketing has a significantly positive impact only at the top end, the marketing decision can be a costly strategy for the fund families.

5.7 Robustness Tests

To supplement the main fixed effect tests, we modify the unexpected flow measure using the methodology in Warther (1995) to provide Generalized Method of Moments (GMM) analysis. Fund flow is known to be highly autocorrelated, meaning a portion of the fund flow is predictable. Warther (1995) uses Box-Jenkins diagnostics to identify the time-series properties of fund flows and uses time-series models to estimate the unexpected component of the flows. Warther (1995) uses time-series analysis at aggregate fund flow level, whereas our data are panel data with a relative short time period. To derive the unexpected flow, lagged dependent variables need to be included in the model. This leads us to apply the system Generalized Method of Moments (GMM) procedure of Arellano and Bond (1991) in the dynamic panel data. We regress the standard fractional flow measure and add lagged dependent variables (lagged flows) as long as the lagged values are significant. We use further lagged flows as level and difference instruments.[21] It turns out that the level instrument is lagged by 2 years and the difference instrument is lagged by 3 years. The resulting equation is assessed by Sargan test, and the Sargan P value suggests the over

[21] The Xtdpd command in Stata is used to estimate the system GMM. Xtdpd enables separate specifications for each instrument.

identifying moment conditions are valid. In addition, Arellano-Bond test is run to ensure residuals are not autocorrelated. Both order 1 and order 2 tests statistics indicate there is no serial correlation in the idiosyncratic errors. We then use the residual value in the model as the unexpected flow for the current period. The results reported in Table 8 are at no variation with earlier analysis.

We also performance robustness checks by including the non-public offer families, as they account for more than half of the initial sample. And we create dummy variables for banks and insurers who offer financial products other than superannuation, because they tend to have higher levels of visibility compared to other entities that offer superannuation products only. The results for these tests are similar to the main results.

6. Conclusion

Superannuation is important to Australians in terms of both its economic and social implications. Australians are offered various levels of choice in their superannuation arrangements. While much of the literature focuses on the investment strategy (individual fund) choice, very little analysis is available on investors' choices at fund family level. This study examines the choice of superannuation fund families, or the choice to rollover accumulated savings to another superannuation family. In contrast to the managed funds setting, results show a lack of convexity in the flow-performance relation, and superannuation fund members appear to withdraw assets from fund families with poor performance. Performance-maximization is not the optimal strategy. However, poor performers still need to spend effort in improving return to avoid outward rollovers and to retain members. There is a strong positive association between a family's rollovers and its relative levels of advertising expenditures with a significant effect for high relative advertisers only. The results suggest that marketing attracts unsophisticated superannuation investors into retail

superannuation families. In contrast, marketing is not useful strategy for industry superannuation families to attract investments.

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Table 1

This table reports the sample selection process. TNA represent total net asset under management. MktExp is marketing expense. The number of investment options is denoted as InvOpt. Return is APRA-reported family return. The flow measures (Net Rollover, Inward Rollover and Outward Rollover) are APRA-reported transfers among superannuation entities.

Sample Selection Criteria/Superannuation Fund Family Type	Corporate	Industry	Public Sector	Retail	Retail-ERF	Total
Initial Sample	1386	597	220	1815	148	4166
Delete non-public offer families	1301	239	176	325	10	2051
Delete Defined Benefit families	6	0	0	49	0	55
Delete families with year-end other than 30 June	10	0	0	107	0	117
Delete families with missing Net Rollover	0	0	0	0	0	0
Delete families with negative or missing Inward Rollover	0	0	0	11	0	11
Delete families with negative or missing Outward Rollover	0	0	0	0	0	0
Delete families with missing Return	3	0	0	19	0	22
Delete families with 0 or missing TNA	2	1	0	41	3	47
Delete families with negative or missing MktExp	0	2	0	5	0	7
Delete families with non-positive or missing InvOpt	0	0	0	0	0	0
Delete families with non-positive or missing Above50	9	1	0	41	3	54
Final Sample	55	354	44	1217	132	1802

Table 2

This table reports means of the full sample from 2005 to 2014. At the end of each year, I calculate the cross-sectional mean value of the following superannuation fund family characteristics: total net asset under management (TNA), marketing expense (MktExp), investment options (InvOpt), APRA-reported family return (Return) and the proportion of members above the age of 50 (Above50). The flow measures (Net Rollover, Inward Rollover and Outward Rollover) are APRA-reported transfers among superannuation entities.

Year	N	TNA (in millions)	MktExp (in millions)	InvOpt	Return (%)	Above50 (%)	Net Rollover (in millions)	Inward Rollover (in millions)	Outward Rollover (in millions)
2005	223	883.77	1.12	51.74	9.88	37.23	50.01	133.75	82.94
2006	203	1394.64	1.77	61.66	11.95	36.78	78.68	223.62	141.37
2007	201	1883.08	2.46	67.12	13.03	37.18	47.77	218.82	183.21
2008	190	2601.77	2.55	99.19	−7.97	36.05	27.79	246.07	204.43
2009	191	2668.43	2.27	104.46	-10.21	38.90	23.55	189.60	165.84
2010	177	2502.60	1.80	115.37	7.44	39.00	45.39	230.53	168.15
2011	165	3172.61	1.96	147.82	6.64	39.79	36.43	229.33	194.48
2012	158	3770.27	1.92	150.31	−0.39	41.05	6.25	223.41	232.96
2013	150	3957.86	2.52	161.87	11.58	43.23	10.93	271.09	250.89

2014	144	5210.54		271.97	9.44		23.12	314.27	307.18

Table 3

This table reports means of the **retail/industry** superannuation fund families in the sample from 2005 to 2014. At the end of each year, I calculate the cross-sectional mean value of the following superannuation fund family characteristics: total net asset under management (TNA), marketing expense (MktExp), investment options (InvOpt), APRA-reported family return (Return) and the proportion of members above the age of 50 (Above50). The flow measures (Net Rollover, Inward Rollover and Outward Rollover) are APRA-reported transfers among superannuation entities.

Panel A: Retail Families

Year	N	TNA (in millions)	MktExp (in millions)	InvOpt	Return (%)	Above50 (%)	Net Rollover (in millions)	Inward Rollover (in millions)	Outward Rollover (in millions)
2005	161	892.38	0.93	68.93	10.01	42.68	57.42	158.03	99.50
2006	138	1406.54	1.59	86.59	12.05	43.77	80.30	252.15	179.10
2007	142	1686.67	2.05	91.95	12.94	44.06	50.28	249.52	216.46
2008	129	2526.93	2.23	142.38	-8.68	42.67	31.32	298.77	247.05
2009	131	2439.80	1.77	148.69	-9.84	46.31	16.52	216.62	199.79
2010	117	2265.16	1.12	170.50	7.60	46.60	64.92	290.51	205.95
2011	106	2944.85	1.55	225.73	6.42	47.93	27.53	262.05	236.99
2012	100	3299.44	1.33	232.61	-0.85	49.76	9.43	263.77	279.31
2013	98	3255.88	1.53	242.85	11.50	52.36	22.30	305.18	268.70
2014	95	4305.58		405.58	8.81		57.99	343.14	316.33

Panel B: Industry Families

Year	N	TNA (in millions)	MktExp (in millions)	InvOpt	Return (%)	Above50 (%)	Net Rollover (in millions)	Inward Rollover (in millions)	Outward Rollover (in millions)
2005	29	1625.14	2.93	12.69	11.76	23.81	53.13	122.97	69.84
2006	38	1855.14	3.26	13.21	13.67	23.08	121.98	246.39	79.07
2007	36	2971.31	5.08	10.33	15.16	22.01	61.04	190.86	129.82
2008	37	3474.97	4.99	11.24	-6.81	23.72	29.53	175.64	146.12
2009	38	3899.94	4.46	10.82	-12.02	23.75	51.30	167.84	116.54
2010	36	3815.54	4.76	11.08	7.80	23.66	0.60	144.53	124.21
2011	36	4536.78	3.85	10.61	8.03	25.24	51.41	199.47	148.06
2012	37	5448.09	3.58	10.78	0.41	27.04	7.09	192.46	185.37
2013	34	6149.54	5.29	11.65	13.46	26.05	2.06	259.40	257.34
2014	33	7959.79		16.24	11.71		-57.12	310.07	347.33

Table 4

This table examines the determinants of superannuation fund family investment flows. The flow measures (Net Rollover, Inward Rollover and Outward Rollover) are APRA-reported transfers among superannuation entities. All the flow measures are scaled by superannuation fund family size. Each year, fractional performance ranks ($Perf_{t-1}$) ranging from zero to one are assigned to superannuation fund families according to their return in last year. Marketing Expense (MktExp) is scaled by TNA. $LnTNA_{t-1}$ is the lagged natural logarithm of net asset under management. LnInvOpt is the natural logarithm of the number of investment options offered by a superannuation fund family. The proportion of members above the age of 50 is denoted as Above50. Robust p-values are reported in parentheses. ***, ** , and * denote dignificance at the 1%, 5% and 10% level, respectively.

Sample	All Families	All Families	All Families	Retail Families	Retail Families	Retail Families	Industry Families	Industry Families	Industry Families
Choice Measure	Net Rollover	Inward Rollover	Outward Rollover	Net Rollover	Inward Rollover	Outward Rollover	Net Rollover	Inward Rollover	Outward Rollover
Perf t-1	0.057***	0.024	-0.032***	0.062**	0.029	-0.030*	0.032	0.024	-0.010*
	(0.009)	(0.262)	(0.006)	(0.034)	(0.327)	(0.056)	(0.164)	(0.360)	(0.061)
MktExp	16.876***	18.912***	1.358	21.930***	23.984***	1.226	-1.977	-2.587	-1.513
	(0.002)	(0.000)	(0.150)	(0.001)	(0.000)	(0.283)	(0.672)	(0.616)	(0.333)
LnTNA t-1	-0.002	0.002	0.004	-0.003	0.003	0.006	0.002	-0.004	-0.006***
	(0.763)	(0.694)	(0.206)	(0.693)	(0.667)	(0.100)	(0.877)	(0.709)	(0.000)
LnInvOpt	0.010*	0.004	-0.006	0.009	0.002	-0.007	0.032	0.034	0.002
	(0.054)	(0.407)	(0.129)	(0.134)	(0.715)	(0.115)	(0.131)	(0.130)	(0.508)
Above50	0.062	0.097**	0.044*	0.049	0.089**	0.050*	0.205*	0.150	-0.064***
	(0.146)	(0.020)	(0.088)	(0.286)	(0.044)	(0.082)	(0.093)	(0.243)	(0.000)
Constant	-0.204***	-0.110***	0.094***	-0.114***	-0.031	0.081***	-0.043	0.061	0.112***
	(0.000)	(0.001)	(0.005)	(0.004)	(0.439)	(0.000)	(0.439)	(0.310)	(0.000)
Observations	1,332	1,332	1,332	897	897	897	267	267	267
Adjusted R-squared	0.094	0.123	0.141	0.126	0.148	0.055	0.081	0.058	0.416
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Family Type Controlled	Yes	Yes	Yes	No	No	No	No	No	No

Table 5

This table examines the determinants of superannuation fund family choices, using the alternative choice measures. PerCon is the scaled personal member contributions. EmplCon represents the employer contributions, which is also scalded by TNA. DefAsset is the proportion of fund asset in the default option. TotNew is the number of new members each year. Each year, fractional performance ranks ($Perf_{t-1}$) ranging from zero to one are assigned to superannuation fund families according to their return in last year. Marketing Expense (MktExp) is scaled by TNA. $LnTNA_{t-1}$ is the lagged natural logarithm of net asset under management. LnInvOpt is the natural logarithm of the number of investment options offered by a superannuation fund family. The proportion of members above the age of 50 is denoted as Above50. Robust p-values are reported in parentheses. ***, ** , and * denote significance at the 1%, 5% and 10% level, respectively.

Sample	All Families	All Families	All Families	All Families
Choice Measure	PerCon	EmplCon	DefAsset	TotNew
Perf t-1	-0.000	6.609	0.009	0.021*
	(0.975)	(0.291)	(0.789)	(0.091)
MktExp	2.304***	714.754	-11.868***	8.437***
	(0.003)	(0.299)	(0.003)	(0.002)
LnTNA t-1	0.003**	-1.626	-0.012	0.000
	(0.032)	(0.288)	(0.146)	(0.929)
LnInvOpt	0.000	0.327	-0.091***	0.011***
	(0.981)	(0.345)	(0.000)	(0.003)
Above50	0.042***	-5.888	-0.027	-0.107***
	(0.001)	(0.287)	(0.733)	(0.000)
Constant	-0.041***	8.155	0.795***	0.182***
	(0.000)	(0.295)	(0.000)	(0.003)
Observations	1,332	1,332	1,331	1,320
Adjusted R-squared	0.236	0.059	0.450	0.136
Year Fixed Effect	Yes	Yes	Yes	Yes
Family Type Controlled	Yes	Yes	Yes	Yes

Table 6

This table examines the determinants of superannuation fund family choices, using the alternative choice measures. PerCon is the scaled personal member contributions. EmplCon represents the employer contributions, which is also scalded by TNA. DefAsset is the proportion of fund asset in the default option. TotNew is the number of new members that join the family each year. Each year, fractional performance ranks ($Perf_{t-1}$) ranging from zero to one are assigned to superannuation fund families according to their return in last year. Marketing Expense (MktExp) is scaled by TNA. $LnTNA_{t-1}$ is the lagged natural logarithm of net asset under management. LnInvOpt is the natural logarithm of the number of investment options offered by a superannuation fund family. The proportion of members above the age of 50 is denoted as Above50. Robust p-values are reported in parentheses. ***, ** , and * denote significance at the 1%, 5% and 10% level, respectively.

Sample	Retail Families	Retail Families	Retail Families	Retail Families	Industry Families	Industry Families	Industry Families	Industry Families
Choice Measure	PerCon	EmplCon	DefAsset	TotNew	PerCon	EmplCon	DefAsset	TotNew
Perf t-1	-0.003	8.132	-0.006	0.025	-0.005	-0.010	0.044	0.005
	(0.782)	(0.283)	(0.896)	(0.124)	(0.449)	(0.190)	(0.269)	(0.704)
MktExp	3.139***	915.095	-15.692***	12.495***	-1.031	-2.539	-24.665	-1.674
	(0.000)	(0.293)	(0.001)	(0.000)	(0.403)	(0.245)	(0.208)	(0.716)
LnTNA t-1	0.004**	-2.155	-0.021**	0.002	0.001	-0.000	0.036	-0.002
	(0.036)	(0.281)	(0.035)	(0.517)	(0.396)	(0.833)	(0.102)	(0.710)
LnInvOpt	-0.000	0.501	-0.088***	0.010**	-0.003	0.001	-0.128***	0.021**
	(0.961)	(0.327)	(0.000)	(0.014)	(0.436)	(0.730)	(0.009)	(0.038)
Above50	0.036***	-6.509	0.027	-0.109***	0.085***	-0.188***	-0.393***	-0.110**
	(0.008)	(0.287)	(0.749)	(0.000)	(0.001)	(0.000)	(0.010)	(0.026)
Constant	-0.020**	12.111	0.825***	0.078***	0.013	0.186***	0.999***	0.108***
	(0.023)	(0.279)	(0.000)	(0.004)	(0.178)	(0.000)	(0.000)	(0.004)
Observations	897	897	896	894	267	267	267	259
Adjusted R-squared	0.216	0.078	0.323	0.166	0.467	0.593	0.198	0.136
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 7

This table presents the results of piecewise regressions of investment flows on different marketing expense ranges. The flow measures (Net Rollover, Inward Rollover and Outward Rollover) are APRA-reported transfers among superannuation entities. All the flow measures are scaled by superannuation fund family size. Each year, fractional performance ranks ($Perf_{t-1}$) ranging from zero to one are assigned to superannuation fund families according to their return in last year. The fractional rank for superannuation fund families in the bottom marketing expense quintile (LowMkt) is defined as min(MktExp, 0.2). Families in the three medium marketing expense quintiles (MidMkt) is defined as min(MktExp– Low, 0.6). The rank for the top quintile (High) is defined as MktExp – MidMkt – LowMkt. For example, a fund family in the 10th percentile would experience flows of $0.1 \times b_1$ if all the other covariates were equal to zero. On the other hand, a fund family in the 90th percentile would experience flows of $0.2 \times b_1 + 0.6 \times b_2 + 0.1 \times b_3$ if all the other covariates were zero. $LnTNA_{t-1}$ is the lagged natural logarithm of net asset under management. LnInvOpt is the natural logarithm of the number of investment options offered by a superannuation fund family. The proportion of members above the age of 50 is denoted as Above50. Robust p-values are reported in parentheses. ***, ** , and * denote dignificance at the 1%, 5% and 10% level, respectively.

Sample	All Families	All Families	All Families	Retail Families	Retail Families	Retail Families	Industry Families	Industry Families	Industry Families
Choice Measure	Net Rollover	Inward Rollover	Outward Rollover	Net Rollover	Inward Rollover	Outward Rollover	Net Rollover	Inward Rollover	Outward Rollover
Perf t-1	0.054**	0.023	-0.030***	0.058**	0.027	-0.028*	0.029	0.022	-0.009*
	(0.015)	(0.304)	(0.008)	(0.046)	(0.364)	(0.069)	(0.164)	(0.360)	(0.082)
LowMkt	0.184	0.131	-0.074	0.160	0.016	-0.149	-0.233	-0.163	0.079*
	(0.131)	(0.283)	(0.245)	(0.337)	(0.928)	(0.102)	(0.338)	(0.535)	(0.078)
MidMkt	-0.085**	-0.045	0.050**	-0.102*	-0.045	0.066**	0.020	0.009	-0.021*
	(0.041)	(0.264)	(0.024)	(0.084)	(0.428)	(0.039)	(0.633)	(0.849)	(0.089)
HighMkt	0.862***	0.889***	-0.042	1.274***	1.297***	-0.063	-0.056	-0.064	0.003
	(0.004)	(0.002)	(0.631)	(0.003)	(0.002)	(0.609)	(0.590)	(0.554)	(0.904)
LnTNA t-1	-0.005	-0.001	0.004	-0.007	-0.000	0.006*	0.002	-0.004	-0.006***
	(0.381)	(0.877)	(0.175)	(0.367)	(0.961)	(0.082)	(0.874)	(0.693)	(0.000)
LnInvOpt	0.010*	0.004	-0.006	0.008	0.002	-0.006	0.032	0.035	0.002
	(0.058)	(0.395)	(0.145)	(0.167)	(0.727)	(0.141)	(0.122)	(0.129)	(0.648)
Above50	0.054	0.093**	0.049*	0.037	0.082*	0.056*	0.203*	0.147	-0.065***
	(0.177)	(0.020)	(0.070)	(0.403)	(0.057)	(0.063)	-0.233	(0.238)	(0.000)
Constant	-0.171***	-0.081*	0.088**	-0.063	0.026	0.082***	-0.009	0.085	0.100***
	(0.004)	(0.075)	(0.019)	(0.221)	(0.623)	(0.001)	(0.865)	(0.122)	(0.000)
Observations	1,332	1,332	1,332	897	897	897	267	267	267
Adjusted R-squared	0.059	0.077	0.146	0.077	0.090	0.064	0.077	0.053	0.438
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Family Type Controlled	Yes	Yes	Yes	No	No	No	No	No	No

Table 8

This table examines the determinants of superannuation fund family choices, using the alternative choice measures. Unexpected Flow is the derived residual of a dynamic panel data regression for fractional net flows. Each year, fractional performance ranks ($Perf_{t-1}$) ranging from zero to one are assigned to superannuation fund families according to their return in last year. Marketing Expense (MktExp) is scaled by TNA. $LnTNA_{t-1}$ is the lagged natural logarithm of net asset under management. LnInvOpt is the natural logarithm of the number of investment options offered by a superannuation fund family. The proportion of members above the age of 50 is denoted as Above50. Robust p-values are reported in parentheses. ***, ** , and * denote significance at the 1%, 5% and 10% level, respectively.

Sample	All Families	Retail Families	Industry Families
Choice Measure	Unexpected Flow	Unexpected Flow	Unexpected Flow
Perf t-1	0.005	0.001	0.016
	(0.504)	(0.901)	(0.253)
MktExp	4.544***	5.899***	-0.894
	(0.004)	(0.002)	(0.522)
LnTNA t-1	-0.004*	-0.005*	-0.006
	(0.051)	(0.073)	(0.286)
LnInvOpt	0.004**	0.004*	0.017
	(0.032)	(0.065)	(0.110)
Above50	-0.005	-0.010	0.050
	(0.743)	(0.498)	(0.251)
Constant	-0.038***	-0.001	-0.065***
	(0.005)	(0.927)	(0.001)
Observations	1,332	897	267
Adjusted R-squared	0.693	0.641	0.833
Year Fixed Effect	Yes	Yes	Yes
Family Type Controlled	Yes	No	No