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This article was originally published as: Gerrans, P. A., Clark-Murphy, M. C., & Speelman, C. P. (2006). Asset allocation and age effects in superannuation investment choice. Proceedings of 35th Australian Conference of Economists. (pp. 1-33). Perth. Curtin Business School. Original article available here
This Conference Proceeding is posted at Research Online.
http://ro.ecu.edu.au/ecuworks/1763

Asset Allocation and Age Effects in Superannuation Investment Choice

by
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Abstract
This paper examines the asset allocation decisions of the members of three Australian superannuation funds which have combined assets of $23.7 billion and 1.3 million members. The Superannuation Guarantee has made Australian employees compulsory investors. Conventional wisdom seems to suggest that individuals allocate less to risky assets as they age whereas investments theory has provided conflicting advice. This paper provides a preliminary examination of how the investment strategy and asset allocation choices of members make may change with age.

Keywords: Retirement savings, Superannuation, Asset allocation
JEL Codes: D91, G11, D14

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The authors gratefully acknowledge the support of the GESB, UniSuper, STA and HESTA in the conduct of this research. We would also like to thank the great efforts of Jacqui Whale in making sense of four databases so quickly and extracting the data for the analysis.

1.0 Introduction

The Superannuation Guarantee has made Australian employees compulsory investors. Nine percent of earnings must be paid at least every quarter by employers on behalf of employees to a complying superannuation fund.[1] A majority of Australian workers face two choices about what happens with this superannuation guarantee contribution. These choices can be distinguished by who offers the choice. The first is offered by the employer and is the choice of which superannuation fund the employee wishes her superannuation contributions be directed to. With the passage of the Superannuation Legislation Amendment (Choice of Superannuation Funds) Act 2004, this choice became mandatory for 5.2 million of a potential 9.5 million employees who previously did not have this choice (Clare, 2005).[2] The second is offered by the superannuation fund and is the choice of investment strategy for contributions.[3] This offer of choice is not mandatory but superannuation funds offer these choices as integral selling features of their products. This paper focuses on the second choice, and specifically how the investment strategy and asset allocation may change with member age. The common advice from funds and advisers is to reduce exposure to growth assets towards retirement. The following is typical:

> If you are approaching retirement, and you are accessing your super over time, you should consider investing in asset classes such as shares and property securities, to increase your potential for growth. If you are close to retirement and need to withdraw all your super, then a low risk, low return might be appropriate (Vanguard Investments, 2005, 12-13).

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[1] The guarantee is payable to employees less than 70 years of age earning greater than $450 per calendar month. Those under 18 must be working greater than 30 hours per week to receive the contribution.

[2] Clare (2005) notes that including the employees covered by state legislation, this number increases to 5.7 employees that have a statutory right to choice of superannuation fund. Choice of fund is somewhat of a misnomer as individuals always have the choice of where to direct their own extra contributions.

[3] SISA 52(4) and SISR 4.02 allow for direction to the extent of choosing from a range of asset classes or readymade options. This covers the investment choice that funds offer members. This direction does not extend to specific assets as this would be taken as breaching the requirement of a trustee not be directed on an investment.

Investments theory has suggested both that allocations to asset classes should be independent of age (Samuelson, 1969) and should respond to ageing by decreasing exposure to risky assets (Bodie, 2003; Samuelson, 1989).

Examination of individuals or households actual asset allocation is rarely afforded access to complete datasets of all aspects of wealth. In reference to the literature which has examined asset allocation it has been noted:

> A striking feature of much of this literature is that it pays scant attention to the most important non-human assets available to individuals or households approaching retirement – housing and social security. We believe that little of relevance can be said about asset allocation unless these are included in the analysis (Iwaisako, Mitchell and Piggott, 2004, p.4).

While we agree with the general message of the authors, given the limited Australian evidence on asset allocation within superannuation by age we believe we can make a modest contribution to the literature with access to a very large database of member investment choices within supernnuation.[4]

Three superannuation funds have allowed access to their membership data to enable examination of investment strategy. The Health Employees Superannuation Trust Australia (HESTA), the Superannuation Trust of Australia (STA), and the Government Employees Superannuation Board (GESB) have combined assets of $23.7 billion and 1.3 million members. HESTA and STA are industry funds whereas GESB is a public-sector fund. HESTA's 508665 members[5] are predominantly from the health and community services, it was one of the first industry funds to offer choice to its members in 1995. STA started as the fund for the manufacturing sector though now it has members in a variety of industries including automotive,

[4] It is also noted that the implication of the statement is that individuals consider each of these forms of savings as part of total portfolio which is not necessarily supported.
[5] HESTA 2005 Annual Report

entertainment and transport and total members of 515000[6]. Choice was introduced to STA members in July 1997. The majority of GESB members receive automatic membership into the West State Super Scheme when they join the Western Australia public sector. West State Super has 232677 members and first offered choice in April 2001.

The next section of this paper reviews the literature related to the influence of age on the formulation of an investment strategy and asset allocation. The third section examines the current level of investment choice offerings in Australian superannuation funds. Section four reviews the data for the three funds used in the analysis. Section five provides a preliminary analysis of investment choice and equity asset allocation by age and the final section concludes with future analysis suggestions for the data.

2.0 Literature Review

2.1 Investment Asset Allocation and Age: Theory

Superannuation fund trustees are obligated to formulate an investment strategy for their members' assets. Section 52 of the Superannuation Industry (Supervision) Act 1993, codifies the requirement of funds with regard to the investment strategy. The Australian Prudential Regulation Authority (APRA) (2006) issues more detailed guidelines for trustees in formulating such a strategy. The guidelines have only recently been updated from a 1999 version.

[6] STA 2005 Annual Report

There are two interesting aspects of the update. The first is that it is arguably stronger in the expectations it identifies for trustees with regard to members exercising investment strategy choice. For example it provides a warning that it would be difficult for a trustee to argue that allowing members “narrow or risky” choices without regard to what proportion of their contributions or balance the member allocates to them was acting in the best interests of members. The guidelines suggest that allocation limits could be one way trustees act to reduce this risk for members. The guidelines go further to suggest that if members are or could be identified as making prima-facie narrow allocation decisions, the fund should consider providing warnings to these members though it is not clear whether this is intended to be individual member or fund-wide warnings (APRA, 2006, para.45).

The second interesting aspect of the update is the removal of a reference to “contemporary risk and portfolio management theories” (APRA, 1999, para.18). This may reflect that contemporary theories do not suggest a singular view of what is considered optimal asset allocation, with a notable point of difference in contemporary theories being investment strategy considering the age of members.

Davis (2001) outlines the steps in institutional pension investment with the starting point being the efficient frontier of Markowitz’s modern portfolio theory. Having identified the frontier the choice for fund management is which level of risk to accept in attempting to achieve the desired rate of return. The next step is to consider the constraints on investment which include liquidity, liability investment horizon, regulation and tax. Each fund will have a particular profile of members which determines a timeline of expected liability and investment liquidation. Davis (2001)

notes that it is the nature of the liabilities that distinguishes the investment decision of institutional investors such as superannuation trustees. These liabilities have dimensions of size and timing. In the case of a defined benefit fund the size may be unknown with unknown timing. The trustee needs to build sufficient assets by accepting an adequate level of risk that does not threaten the funds liquidity or solvency.

Samuelson (1989) summarises the development of views regarding portfolio asset allocation with age. He notes that conventional or folk wisdom suggests that investors should be more risk tolerant when young and decrease exposure to relatively risky equities in favour of lower risk cash and fixed interest securities. Samuelson's (1969) early work demonstrated that a rational wealth maximiser with constant relative risk aversion will keep a constant proportion in equities over time. Samuelson (1991) subsequently demonstrated that the conventional wisdom could be supported if the assumption of a random walk for securities is replaced with mean reversion and negative serial correlation and this held even when the assumption was retained.

Samuelson (1994) argues that given a desired for a minimum level of retirement wealth will imply an optimal investment strategy of declining equity allocation with age. McNaughton, Piggott, and Purcal (1999) argue that this view is mistaken, based on the exclusion of the differential return to risky and safe assets by Samuelson (1994), and in fact suggest that an increasing equity allocation with age is more likely.

Bodie, Merton and Samuelson (1992) and Bodie (2003) suggests two reasons why the proportion of risky assets should decline with age. The first flows from the fact that

when we are young, typically a large proportion of our total wealth is in human capital. Further this human capital is usually less risky than equity. With a large proportion in lower risk human capital, to get more risk into the individual's total wealth portfolio the proportion invested in equity is increased. With age the proportion that human capital comprises of total wealth (human capital plus financial capital) declines. Therefore the individual decreases their proportion of equity held. The second reason relates to the flexibility of their labour supply. That is, the ability to work longer hours or take a second job. If we accept that this flexibility is greater when younger and subsequently declines, the proportion of risky assets will be greatest when younger and subsequently decline.[7]

Other reasons suggested for why asset allocation may vary with age include changing risk aversion with age (Ballente and Green, 2004), and information costs (Haliassos and Bertaut, 1995). A Delphi study of financial educators and financial planners by Greninger, Hampton, Kitt, and Jacquet (2000) reports a relatively weak consensus of opinion on asset allocation with 60 percent agreeing that the proportion of conservative assets should be increased closer to retirement though 20 percent indicated that it was never prudent to do this.

2.2 Investment and Portfolio Asset Allocation and Age: Evidence

Guiso, Haliassos and Jappelli (2000) review age and participation decisions, the decision to invest in shares or other assets (Figure 1), the age and portfolio shares decision, and the decision of what proportion to invest in each asset class (Figure 2), for the U.S., U.K., Netherlands, Germany and Italy.

[7] Bodie (2003) also notes though that the opposite can be true. If you are a young entrepreneur with a large proportion of risky capital it may be optimal to have a lower proportion of risk equity and to increase the proportion with age.

<Insert **Figure 1**>

Guiso, Haliassos and Jappelli (2000) interpret the humped profile in Figure 1 by suggesting fixed costs (entry fees, information) reduce the younger age groups' involvement in risky financial assets. Further, the decline in older age groups is due to decumulation and bequest motives. Guiso, Haliassos and Jappelli (2000) argue that with the exception of the Netherlands, the age profile is generally flat after controlling for other variables.

<Insert **Figure 2**>

Iwaisako, Mitchell and Piggott (2004) use Japanese data and report a positive age impact on equity participation, flattening at the highest age group, for different household types. They also find that while equity portfolio shares increase with income, proportionally more property is held.

Agnew, Balduzzi and Sundén (2003) found a decreasing trend in equity allocation with age using a sample of 7000 401(k) accounts from one plan between 1995 and 1998, excluding cohort effects. Agnew, Balduzzi and Sundén (2003) note that as their sample covers "only a period of roughly four years, it is more natural to estimate and interpret models with age and time effects only".

Ameriks and Zeldes (2004) examined equity allocation by age using a sample of 16000 TIAA-CREF 403(b)[8] accounts between 1987 and 1996, and using five waves of the Survey of Consumer Finances (SCF) between 1983 and 1998. It is notable that the analysis of the SCF data is based on stock of assets and therefore change in allocations may be attributable to relative performance of asset classes. The TIAA-

[8] 403(b) is the not-for-profit equivalent of 401(k) plans. In this case TIAA-CREF.

CREF data permit analysis of future contributions allocations which are not influenced by asset class performance in themselves.

Ameriks and Zeldes (2004) estimate conditional and unconditional equity allocations to explore identification problems with time, cohort and age effects. They suggest that estimation of an age relationship must include time effects as they reject their results including age and cohort effects only as implausible.[9] Overall they conclude that households do not decrease equity shares with age. This result is stronger when they examine equity allocations conditioned on the account having an equity allocation. However they also find both hump-shaped and declining equity allocations by age profiles though this is sensitive to year, using the TIAA-CREF contributions data.[10] The hump effect they suggest is due to the probability of owning equity rather than equity allocation differences. Guiso, Haliassios and Japelli (2000) make a similar point in a summary of international evidence suggesting that the variation observed in allocation to risky assets is due to variation in proportion of households holding risky assets as conditional allocations appear much more stable. McCarthy (2004) also finds strong cohort effects with a household in 2000 holding more risky assets than a comparable household in 1980 though the cause is open for interpretation. Agnew, Balduzzi and Sundén (2003) suggest it is more appropriate to model the decision of equity ownership and allocation jointly as the "same variables determine whether to hold equities and how much equities to hold" (Agnew, Balduzzi and Sundén, 2003) which is the approach adopted in this paper.

[9] Ameriks and Zeldes (2004) discuss the problem inherent in identifying age, cohort and time effects, and explore the problem extensively. Using their notation, a_{it} is the age of member i at time t, b_i is the birth year of member i and t is calendar time. Given that $a_{it} \equiv t - b_{it}$, the inherent problem presents that it is not possible to reject an argument that $f(t, b_i, a_{it})$ was determined by any pairing of the variables.

[10] A hump-shape age profile is evident in the early 1990s with a declining trend replacing it in the latter half of the 1990s. They note the more than double increase in equity ownership by younger members over the period of their sample, for example from 31 percent to 73 percent for 29-year olds.

2.3 Australian Evidence on Portfolio Allocation by Age

The Australian Stock Exchange (2004) indicate that direct ownership of equity (equity participation) increased from 52 percent to 55 percent between 2000 and 2004[11] though they it suggest that the allocation to asset classes has not changed significantly between 2002 and 2004. **Figure 3** identifies that with the exception of 2000, the ASX data indicates that the proportion of individuals owning equity increases monotonically with age.

<Insert **Figure 3**>

The Reserve Bank of Australia (2004), utilising data from the 2002 HILDA survey, reports a humped profile of the proportion of households owning equity by household age. For those aged 16-34 the proportion is 29 percent rising monotonically to 53 percent for those aged 55-64 and declining to 34 percent for households aged 75 or more. The median equity ownership by age also has a humped profile rising from 7 percent for households with a 16-34 year old reference person rising to 48 percent for 65-74 year old before declining to 30 percent for households with a reference person 75 or more. The oldest age group which exhibits a decline in both equity ownership and equity allocation is largely absent in the current sample.

2.4 Australian Superannuation Industry Evidence on Asset Allocations

A number of data sources are available to compare asset allocations of superannuation funds though the quality of this data is varied. Invariably the surveys that examine asset allocation examine the strategic asset allocations nominated by funds in annual reports or prospectuses, though there are two sources of error in using these sources. The first is that these are indicative weightings and invariably the funds will actually operate within a range of weightings. Secondly, not all funds provide the necessary

[11] Data for 2001 is not detailed.

fine breakdown of asset classes. For example some will provide information on only fixed interest securities while others will break this down into Australian and International fixed interest securities. Similarly the use of “other” may vary among funds.

Table 1 summarises asset allocations of Australian retail multisector funds by investment objective, using Morningstar data. The most aggressive funds have an average equity allocation of 75 percent whereas balanced funds have 52 percent. The weighting change is matched by an allocation to fixed interest securities of 30 percent by balanced funds compared with 14 percent for aggressive funds.

<Insert Table 1>

An examination of the APRA (2005) statistics, presented in Figure 4, suggests that the major change in aggregate asset allocations by superannuation funds over the past decade has been an increase in equity exposures at the expense of interest bearing securities. In September 1995 the allocation to equity and unit trusts was 45 percent of total assets. By September 2004 this had grown to 58 percent overall. Interest bearing securities accounted for 29 percent of total assets in September 1995 which declined to 19 percent in September 2004. The shift can in part be explained by the movement from defined benefit to defined contribution funds.

<Insert Figure 4>

3.0 Superannuation Investment Strategy Choice in Australia

3.1 Offerings

The level of investment strategy choice offered in Australia varies by category of fund. Overall 45 percent of funds offer investment strategy choices although if this is measured by the assets of funds offering choice the figure is 89 percent. The

proportion of funds offering choice is lowest for Corporate funds (33 percent of funds or 84 percent of assets) and highest for Industry funds (79 percent of funds or 98 percent of assets). The average number of choices is 23 with Retail funds offering 61 choices on average and Corporate funds four choices.

3.2 Activity

While increased opportunities for choice have been made available to employees, the majority of members do not exercise choice and remain in the default strategy of the fund. The total assets in the default option of funds across the superannuation industry, summarised in Table 2, vary from 53 percent for retail funds to 70 percent for Industry funds. This is not a perfect measure of member activity or degree of engagement in superannuation as the default option may be the member's "choice" and they therefore don't need to change anything, and secondly it does not identify proportion of members or member accounts.

<Insert Table 2>

4.0 Data Description

Each of the funds analysed in this paper offer members the choice of readymade options, with a specified investment strategy, or a do-it-yourself (DIY) strategy where members choose their own investment strategy. The three funds' current offerings are summarised in Table 3 although each fund has added to the options since they introduced choice and a full description of how they have changed is presented in Appendix Two.

<Insert Table 3>

HESTA and STA allow members to choose both individual asset classes and readymade options in a DIY mix whereas GESB only allows selection of asset classes

in a DIY choice. The asset classes and readymade options offered by each fund can be regarded more as generic labels rather than offering a definitive guide to the asset class exposure each contains. As a guide to the differences in asset exposures of readymade options between funds and across time, **Figure 5** groups the specific asset classes into five broad asset classes. The "Other" category includes infrastructure, private equity and absolute return strategies. A full breakdown of each readymade option is included in Appendix One together with the change in weightings over time.

<Insert Figure 5>

A database has been constructed which has all member investment strategy changes from the three funds since choice was introduced to members. Default behaviour is particularly evident in each fund and the following section summarises choice activity for each of the funds. A full breakdown is present in Appendix Two.

HESTA

Between July 1995 and December 2004, 44393 members made 48874 changes to the investment allocation of future contributions. The complete menu of current options has been available since July 2001 and the analysis in this paper focuses on these investment changes. Between July 2001 and December 2004 42986 members made changes with 14689 of these electing the DIY option.

STA

When STA introduced choice in July 1997 the investment strategy choice applied to both the existing balance and future contributions. In January 2002 the ability to have a different investment strategy for the existing accumulated balance and future contributions was introduced. At the same time the DIY option was introduced and by September 2003 members could choose from a mixture of twelve asset classes and ready-made plans. Between July 1997 and December 2004 27488 members made

22969 changes. Between January 2002–December 2004, 15887 members made 18579 changes.

GESB

Since the introduction of choice in July 2001 until June 2004, 17 609 members made a total of 19 688 investment strategy changes.

5.0 Results

5.1 Analysis of Age Effects by Year

To assist analysis the asset classes, presented in and Table 4, are grouped into Aggressive (Shares and Property) and Conservative (Cash and Fixed Interest) asset classes and split by gender. The first observation is that average allocations to both groups of asset classes vary markedly across the funds. For example, the average allocation by GESB members to aggressive assets is approximately 80 percent, 57 percent for HESTA members and 70 percent for STA members with corresponding opposite levels for defensive assets.

<Insert **Table 4**>

Secondly, allocations to cash and shares are different by gender whereas fixed interest securities and property are not for each fund. Males (females) have a higher (lower) mean allocation to shares and a lower (higher) allocation to cash. Each of these differences is significant at a 95% confidence level with the exception of GESB shares allocation differences which are significant at a 90% confidence level.

Third, ANOVA F-tests of equality of mean allocations by age reject equal allocations across age groups for each asset class with the exception of GESB female property allocations and STA male property allocations.

An examination of the allocation to conservative asset classes indicates a generally positive age trend in allocation to cash and fixed interest securities, with some striking contrasting results. GESB female members across each age quintile have much lower cash allocations and the youngest female HESTA members have extremely high cash allocations in each year. This suggests possible fund specific or framing effects may influence allocations. Allocations do vary by year though there is no consistency as to whether this is higher or lower across the funds or between age quintiles.

There is some support for a generally positive allocation to cash and fixed interest securities by age quintile though again this is not uniform. For example, some evidence of a U-shaped age profile can be found, strongest for HESTA males, though it is not otherwise consistent by year or gender.

It is interesting to examine the relative allocations by the two highest age quintiles. In most cases the oldest age quintile across the funds is generally 50 and above. The next youngest quintile is generally those aged between 43 and 49. Arguably it should be the 43 to 49 group where members become more engaged in their retirement planning and interested in their superannuation. Examining each of these groups across the three funds in each year and asset class indicates that in 37 of 45 instances the oldest quintile has a higher allocation to conservative assets than the next younger quintile.

Examination of the aggressive asset classes, presented in Table 5, indicates mixed results. Allocation levels vary by year across age quintiles. For example, the allocation to property is highest in 2003 for HESTA and GESB members and the allocation is lowest for shares in 2003 for all funds. Allocations to property appear

independent of age quintile with the exception of a generally positive trend for HESTA female members. Examining the oldest age quintile across the three funds in each year and asset class indicates that in 33 of 45 instances they have a lower allocation to aggressive asset classes than the next younger quintile.

<Insert Table 5>

5.2 Age Effects and Income

Income and wealth have generally been shown to have a positive impact on the proportion of aggressive assets held. It is interesting to explore whether the age effect is present controlling for contributions. The present database does not have direct information on either variable though a proxy for income is the employer contributions paid on behalf of employees to the fund. Contributions were also broken into quintiles and the allocation to aggressive and conservative assets compared.[12]

Consistent trends are difficult to identify in allocation levels to conservative assets across age quintiles and contributions. There is support for increasing fixed interest securities allocation by age quintile though contributions does not appear to have a consistent impact given the level of crossing evident in the lines.

<Insert Table 6>

In regards allocations to the aggressive asset classes, the results are similar in that contributions do not appear to help explain differences in allocation levels within a fund or between funds. With the exception of STA members the lines are generally tighter. The positive trend for allocation to property by HESTA female members remains. In regards allocation to shares, only HESTA members with the higher levels of contributions having consistently higher allocations to shares across age groups.

[12] At present the analysis excludes time or cohort effects.

Some support for the decline in allocation to shares remains when comparing the two highest age groups.

<Insert Table 7>

5.3 Age Effects and Decision Number

A factor that has not been explored or discussed in the literature is the influence of decision order on asset allocation by member. That is do the allocations differ for the first, second, third, etc. decision and is this consistent by age. Gerrans, Gardner, Clark-Murphy and Speelman (forthcoming) identify an apparent different nature to the first decision a member makes and any further changes in respect of the possible influence of historical performance of asset classes. **Table 8** summarises the breakdown of the proportion of changes in each year by change number. While in each year the majority of changes are the first (and only) change in some years, the later years have a greater proportion of second, third and fourth decisions. This relationship will be explored in further work.

6.0 Conclusion and Further Analysis

This initial analysis has been limited in scope though it has generated interesting results. It is acknowledged that in examining asset allocation by age it is ideal to have information about non-human assets that an individual which is not possible in this paper. However, superannuation is a specific long-term investment vehicle of increasing importance to Australian employees and analysis of the behaviour of a large number of members from different funds is limited.

The results suggest that has that the fund itself may have a significant impact on asset class allocation levels. Large differences are evident between funds suggesting that

possible information or framing effects may be important. The results support the results of Ameriks and Zeldes (2004) which show that it is important to include time or year effects when exploring the influence of age on asset allocations. While gender does appear to have a role in explaining differences in asset allocations it is only for cash and shares, asset classes which are opposite in respect of volatility. In the main allocations to asset classes are significantly different between age quintiles. Support for increasing (decreasing) allocations to conservative (aggressive) asset classes by age quintile can be found however the strength of the relationship is not consistent across all asset classes or funds.

More work is needed to explore the impact of member characteristics including which decision it is that a member is making, an issue unexplored in the literature. Further analysis will also focus on better controlling member characteristics and pay more attention to the distribution of allocations to asset classes, in particular the prevalence of extreme allocations, that is zero and 100 percent allocations. In this respect the censored least absolute differences regressions utilised by Huberman and Jiang (2006) in examining U.S. 401(k) plans member asset class allocations will be useful.

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Appendix One

This table presents the asset class exposures of each fund's readymade options over time.

Fund	Option	Effective	Cash	Australian Fixed Interest	International Fixed Interest	Inflation Linked Bonds	Property	International Shares	Australian Shares	Infrastructure	Private Equity	Absolute Return Strategies	Other
STA	Balanced Plan	07/2001	2.2	11.5	9.5		14.4	18.4	36.7	5.8	1.5	0	
		07/2002	2.6	11.2	9.6		14.3	18.8	36	5.6	1.9	0	
		07/2003	4.4	11.3	10.2		13.5	17.5	33.3	5.9	3.1	0.8	
		07/2004	2.9	8.3	6.2		9.8	24.4	38.6	5.4	2.4	2	
		07/2005	2.3	6.4	2.3		8.2	24.6	39.7	8.5	2.4	2.5	
STA	Shares Plus Plan	07/2001	2.9	0	0		12.2	32.6	46.2	3.5	2.5	0	
		07/2002	3.3	0	0		11.6	33.3	45	3.3	3.5	0	
		07/2003	6.9	0	0		10.9	28.6	39.9	5.8	5.6	2.3	
		07/2004	2.4	0	0		7.3	35.2	41.9	5.5	3.5	4.2	
		07/2005	1.7	0	0		6	34.3	42.4	8.3	3.1	4.2	
STA	Capital Guaranteed Plan	07/2001	30	70	0		0	0	0	0	0	0	
		07/2002	30	70	0		0	0	0	0	0	0	
		07/2003	30	70	0		0	0	0	0	0	0	
		07/2004	30	70	0		0	0	0	0	0	0	
		07/2005	30	70	0		0	0	0	0	0	0	
STA	Low Risk Plan	07/2003	35.5	14.8	14.8		10.9	5	14.9	2.1	2	0	
		07/2004	39.1	13.4	11.5		7.4	6.9	15.1	3.4	1.2	2	
		07/2005	48.5	8.4	7.5		5.5	7.4	14.2	4	0.8	3.7	
HESTA	Cash Plus	07/2001	30	30			12	12	16	0	0	0	0
		07/2002	30	30			12	12	16	0	0	0	0
		07/2003	30	27			12	13	15	0	0	0	0
		07/2004	30	27			12	13	15	0	0	3	0
		07/2005	30	27			12	13	15	0	0	3	0
HESTA	Core Pool	07/2001	2	20			12	17	37	6	6	0	0
		07/2002	2	20			12	23	34	6	3	0	0
		07/2003	2	17			12	26	31	6	3	3	0
		07/2004	2	15			12	25	30	8	5	3	0
		07/2005	4	12			12	23	30	9	4	3	3

Fund	Option	Effective	Cash	Australian Fixed Interest	International Fixed Interest	Inflation Linked Bonds	Property	International Shares	Australian Shares	Infrastructure	Private Equity	Absolute Return Strategies	Other
HESTA	Shares Plus	07/2001	2	3			15	25	43	6	6	0	0
		07/2002	2	3			15	31	40	6	3	0	0
		07/2003	2	0			15	34	37	6	3	3	0
		07/2004	2	0			12	33	36	8	5	3	0
		07/2005	2	0			12	35	38	6	4	0	3
HESTA	Eco Pool	07/2001	10	0			0	40	50	0	0	0	0
		07/2002	10	0			0	40	50	0	0	0	0
		07/2003	10	0			0	40	50	0	0	0	0
		07/2004	10	0			0	40	50	0	0	0	0
		07/2005	10	0			0	40	50	0	0	0	0
GESB	Conservative Plan	07/2001	2	60	0	8	5	15	10				
		07/2002	2	63	0	5	5	15	10				
		07/2003	2	30	34	4	5	15	10				
		07/2004	2	30	34	4	5	15	10				
GESB	Balanced Plan	07/2001	2	30	0	8	10	30	20				
		07/2002	2	33	0	5	10	30	20				
		07/2003	2	15	19	4	10	30	20				
		07/2004	2	15	19	4	10	30	20				
GESB	Growth Plan	07/2001	2	15	0	8	10	40	25				
		07/2002	2	18	0	5	10	40	25				
		07/2003	2	8	11	4	10	40	25				
		07/2004	2	8	11	4	10	40	25				
GESB	Cash Plan	07/2001	100	0	0	0	0	0	0				
		07/2002	100	0	0	0	0	0	0				
		07/2003	100	0	0	0	0	0	0				
		07/2004	100	0	0	0	0	0	0				

Appendix Two

Each fund offers the choice between selecting an investment option where the fund determines the asset allocation, and an option where the member chooses their own asset allocation. The former is labelled a Readymade option in this paper and the latter a do-it-yourself or DIY option. The terminology employed by fund to describe these varies. GESB uses the terms Readymade Plans and MY Plan. HESTA uses Ready-Made Investment Pools and Your Choice. STA labels each as STA Mix options and DIY Mix options.

HESTA

Investment choice was introduced in July 1995 with three readymade pools: Cash Plus, Core Pool (default), and Shares Plus. Members could only choose one option for changes to contributions investment. That is no weightings across the three options. However members were able to allocate across the options in respect of their existing balance. Initially an investment strategy change could only be made once a year and by members with an account balance of $1000. In July 1998 monthly changes were introduced and at this time a $20 fee was also introduced for changes to future contributions. Members had been charged for changing the investment strategy for their existing balance since choice was introduced but not for a change to future contributions. Members could allocate any whole number percentage to each available pool so long as they added to 100 percent.

The next major change made was in February 2000 with the introduction of a fourth readymade pool, the Eco Pool. This pool provided the greatest investment volatility with a 90 percent equity allocation. In July 2001 an Overseas Shares Pool and Australian Shares Pool were introduced with 100 percent equity allocations, bringing the total number of readymade pools to six. In July 2001 a do-it-yourself (DIY) option was introduced with seven asset classes largely reflecting those identified in the readymade pools. In July 2003, Absolute Return Strategies was introduced as an eighth asset class. The eight asset classes available are not as refined as the target asset allocations indicated for the readymade pools. For example, while the Core and Shares Plus Pools identify exposure to Australian and International Infrastructure individually, only Infrastructure is available for the DIY option.

Apart from the number of pools and asset classes available for members, the scope of investment changes has also increased. Prior to July 2003 a member could choose to allocate 100 percent of their existing balance or future contributions within either the six readymade pools or the eight asset classes, but not across both. From July 2003 members could allocate across the fourteen readymade options and asset allocations combined.

STA

Investment choice for STA members was introduced in July 1997 with three readymade options: Balanced (default), Shares Plus and Capital Guaranteed. In April 2000 a Single Company plan was introduced which enabled members to invest in Coles Myer Ltd. shares. The principal reason for this was to enable members to access a discount card at a number of retail outlets. This was subsequently discontinued. In January 2002 a DIY option was introduced initially with Australian Sustainable Shares and International Sustainable Shares. In March 2002 six new asset classes were introduced: Australian Shares, International Shares, Property, Australian Fixed Interest, International Fixed Interest and Cash. In July 2003 a new pooled option (Low Risk Plan) was introduced.

GESB

Investment choice was introduced to members in April 2001. Members have had the same four readymade options plus a DIY option inception. Any change applies to both the existing balance and future contributions. The four readymade options available are Growth Plan, Balanced Plan (default), Conservative Plan and Cash Plan. Members can only choose one option. That is, they cannot spread weightings across the options. The DIY option members have been able to choose from a range of six asset classes. However the number of asset classes was reduced to five, from 1st January 2005, when the Inflation Linked Bonds asset class was removed. This followed a restructure of debt assets exposures which kept overall debt exposure constant but introduced exposure to global bonds at the expense of Australian Fixed Interest Securities. Members are restricted to 5% multiples when selecting asset classes but can change as frequently as desired at no cost.

Investment Strategy Changes Summary

This table summarises the number of accounts and unique members who made a change since choice was introduced for each fund. The top panel details all changes. Analysis in this paper focuses on the changes in the second panel which were made since July 2001 for GESB and HESTA, and January 2002 for STA when the DIY option was introduced allowing members to choose from a menu of asset classes and readymade made pools. DIY represents changes made where only asset classes have been used whereas DIY/Readymade represents where a change includes an allocation of asset classes and readymade options. The final panel indicates the number of changes where both age and contributions records are held.

			Changes					
	Records	Members		Records	Members		Records	Members
	GESB			HESTA			STA	
			July 1995 – December 2004			July 1997– December 2004		
			DIY	14689	13775	DIY	3711	3222
			Pooled/Mixture	34184	31608	Pooled/Mixture	23776	20324
			Total	48873	44393	Total	27488	22969
July 2001-June 2004			July 2001-December 2004			January 2002–December 2004		
DIY	4604	3728	DIY	14689	13775	DIY	3711	3222
Pooled/Mixture	15084	14328	Pooled/Mixture	28297	26981	Pooled/Mixture	15048	13115
Total	19688	17609	Total	42986	40005	Total	18759	15887
July 2001 – June 2004: full data			July 2001-December 2004: full data			January 2002–December 2004: full data		
DIY	3079	2510	DIY	10958	10259	DIY	2664	2289
Pooled/Mixture	9856	9400	Pooled/Mixture	20484	19453	Pooled/Mixture	10309	8902
Total	12935	11628	Total	31442	29109	Total	12973	10843

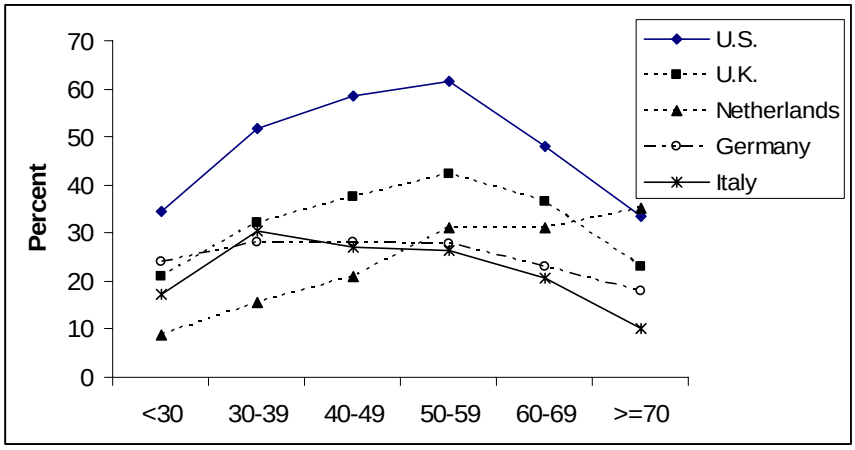


Figure 1 International Risky Financial Assets Participation by Age
Source: Guiso, Haliassos and Jappelli (2000, p.28, Table 5)

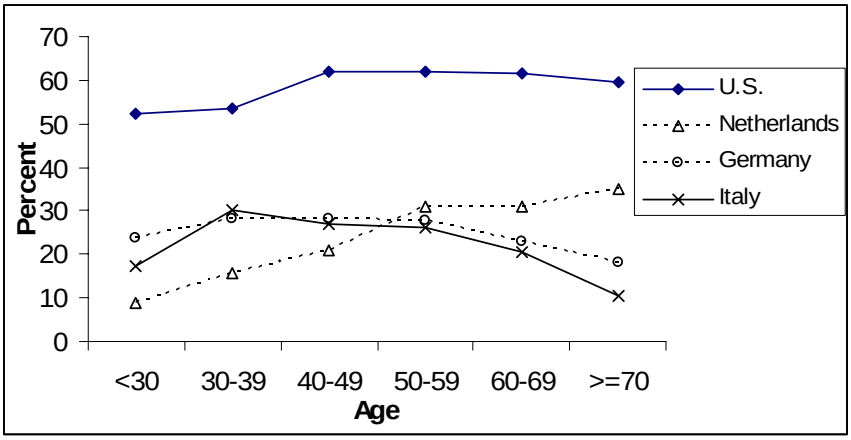


Figure 2 International Conditional Risky Financial Assets Proportion by Age
Source: Guiso, Haliassos and Jappelli (2000, p.28, Table 7)

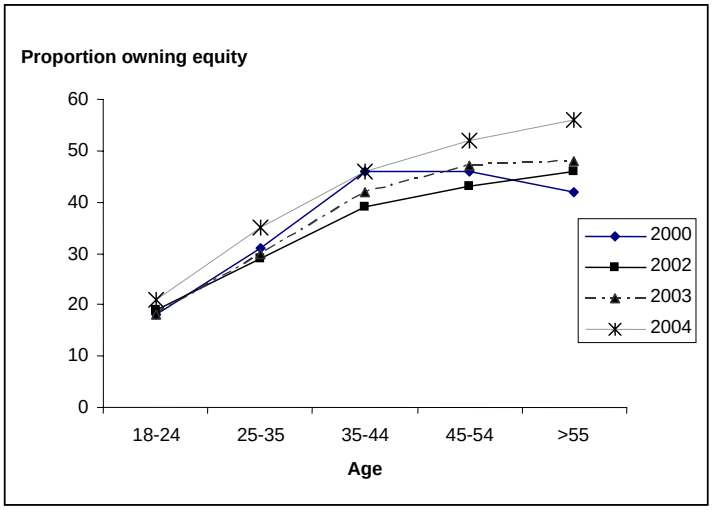


Figure 3 Australian Direct Share Participation by Age
Source: Australian Stock Exchange (2004, p.29)

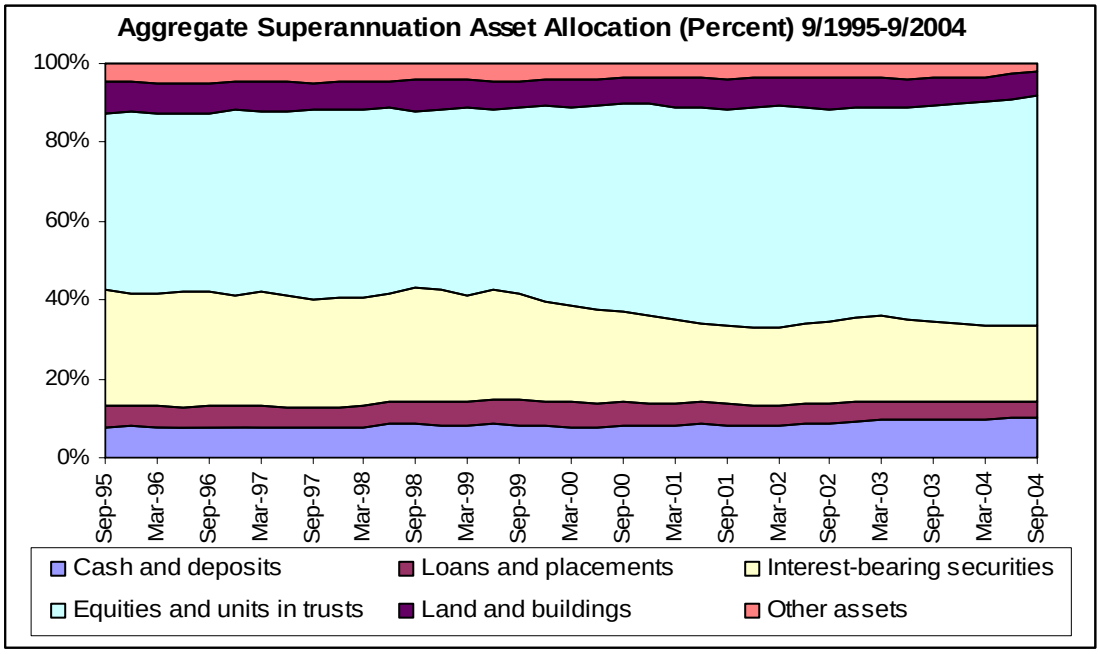


Figure 4 Superannuation Industry Asset Allocations
Source: APRA (2004, Table 15)

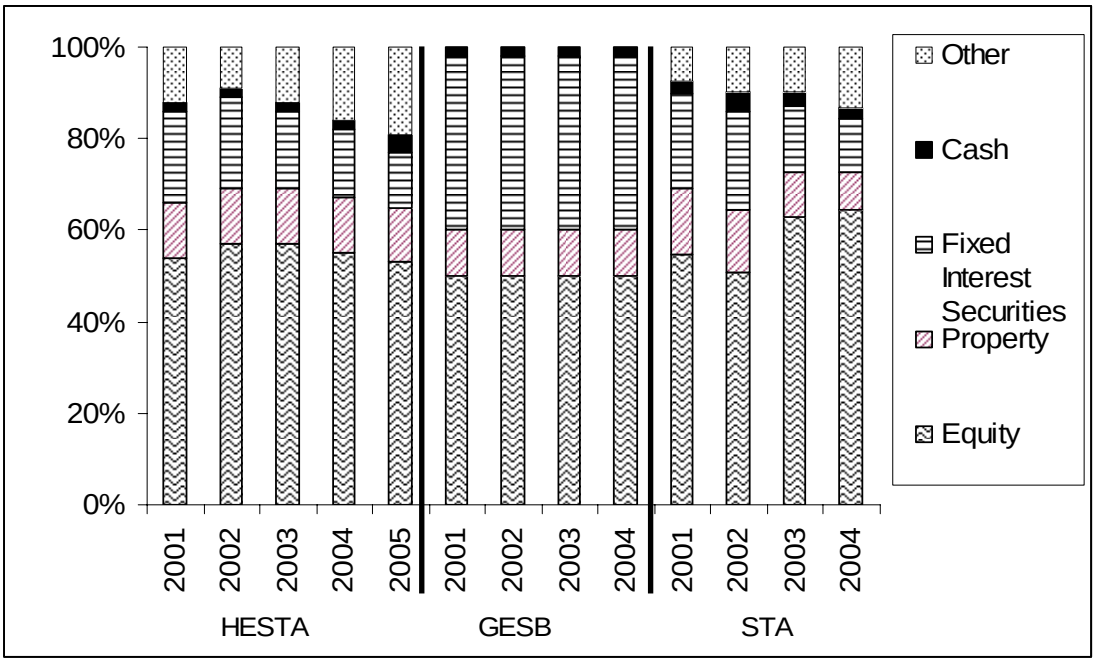


Figure 5 Asset Class Exposures of Fund Default Options

Table 1 Asset Allocations of Multisector Superannuation Funds

	Aggressive (n=20)			Growth (n=202)			Balanced (n=64)		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
Australian Equity	38	35	6	37	39	5	33	30	8
International Equity	37	36	5	25	25	5	19	20	5
Australian Fixed Interest Securities	8	11	2	16	16	2	24	28	7
International Fixed Interest Securities	6	9	3	5	5	3	6	7	3
Australian Property	7	6	4	10	10	7	9	8	4
International Property	0	2	0	0	0	0	0	0	2
Cash	4	5	3	6	7	4	9	8	6
Other	1	3	1	0	0	0	0	0	0

Note: This table summarises the mean percent, median and standard deviation (SD) percentage asset allocation of Multisector Superannuation funds at the time when choice was introduced to GESB members in April 2001. Data compiled using country and investment sector data from Morningstar TotalAccess. *(Gerrans, Gardner, Clark-Murphy and Speelman,, forthcoming)*

Table 2 Default Strategy Assets by funds with more than 4 members

This table shows the amount and proportion of funds held in the default investment strategy by fund type[a].

	Corporate	**Industry**	**Public sector**	**Retail**	**Total**
Total assets ($m)	52489	119752	128630	242622	543493
Assets in default strategy ($m)	30756	82781	91367	97934	302838
Assets in default strategy (percent)	58.6%	69.1%	71.0%	40.4%	55.7%

[a] The table excludes funds with less than four members.

Source: Adapted from Australian Prudential Regulation Authority, (2006, Table 15)

Table 3 Investment Strategy Choices

		GESB	HESTA	STA
Asset Classes	Equity	International Equity Australian Equity	International Shares Australian Shares	International Shares Australian Shares Australian Sustainable Shares International Sustainable Shares
	Property	Property	Property	Listed Property
	Fixed Interest Securities	Fixed Interest Securities Inflation linked bonds	Fixed Interest	Australian Fixed Interest International Fixed Interest
	Cash	Cash	Cash	Cash
	Other		Infrastructure Private Equity Absolute Return Strategies	
Readymade Options		Cash Plan Conservative Plan Balanced Plan Growth Plan	Cash Plus Core Pool Shares Plus Eco Pool Overseas Shares Pool Australian Shares Pool	Capital Guaranteed Plan Low Risk Plan Balanced Plan Shares Plus

Table 4 Conservative Asset Class by Age Profile

STA Asset Allocations for DIY Option
Females:462 Males:2202 Total: 2664

HESTA Asset Allocations for DIY Option
Females: 8127, Males:2831, Total: 10958

GESB Asset Allocations for DIY Option
Female:1546, Males:1533, Total:3079

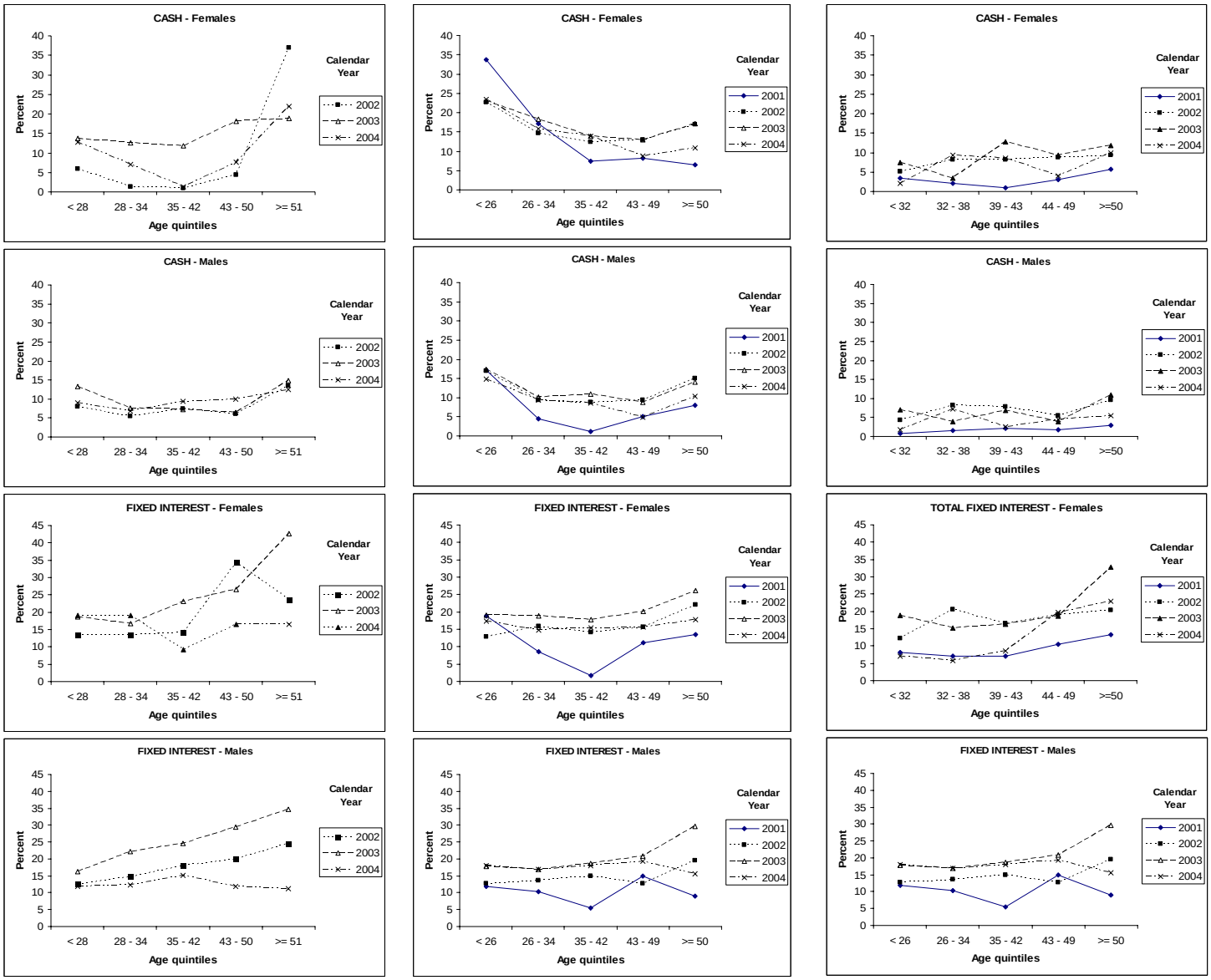


Table 5 Aggressive Asset Class by Age Profile

STA Asset Allocations for DIY Option
Females = 462, Males = 2202, Total =2664

HESTA Asset Allocations for DIY Option
Females: 8127, Males:2831, Total: 10958

GESB Asset Allocations for DIY Option
Female:1546, Males:1533, Total:3079

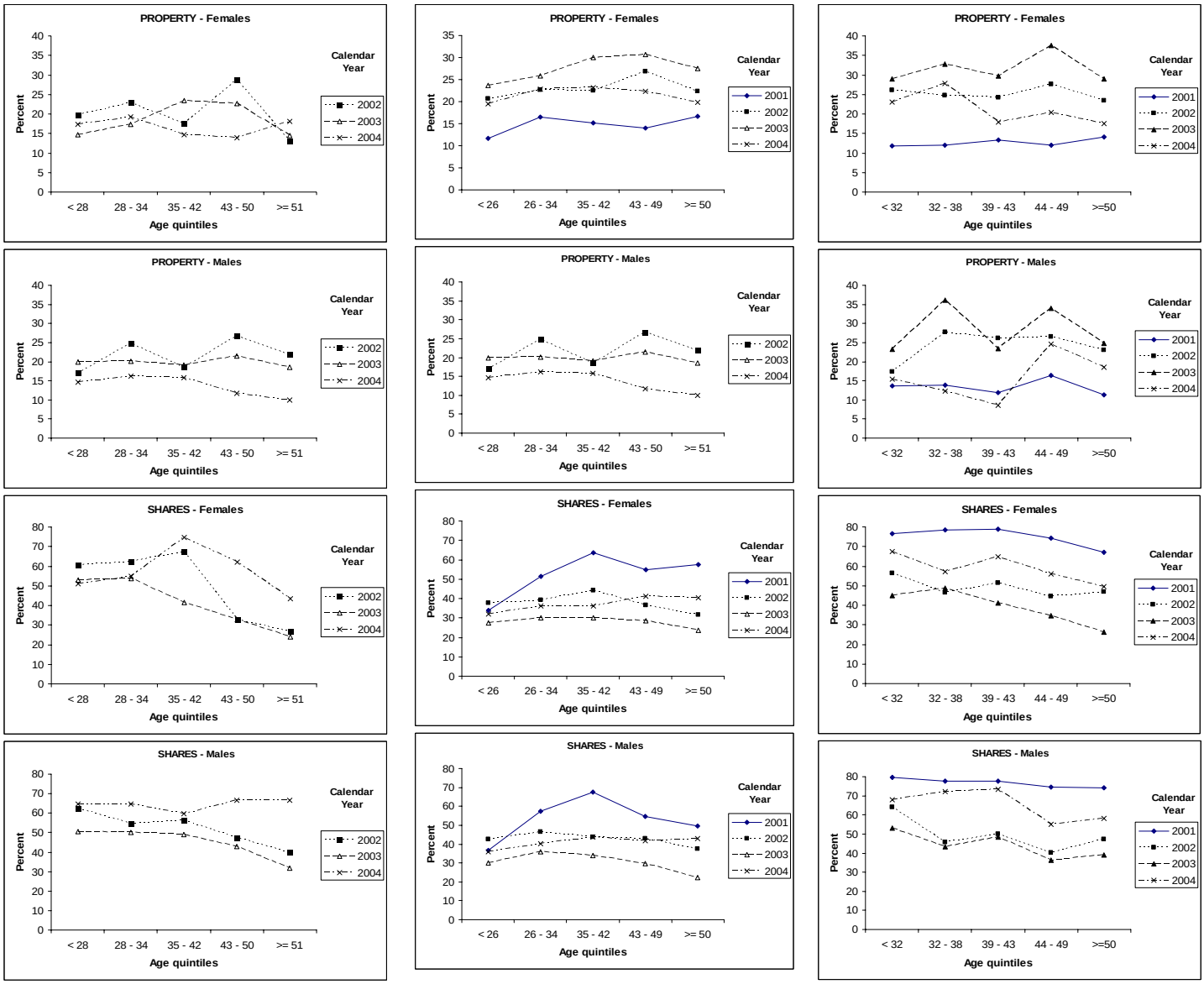
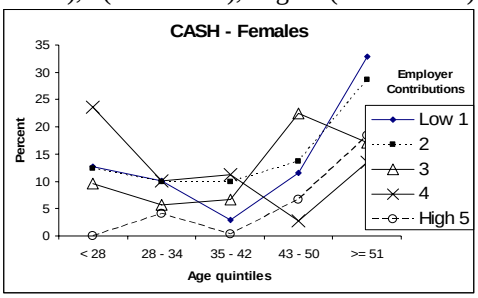
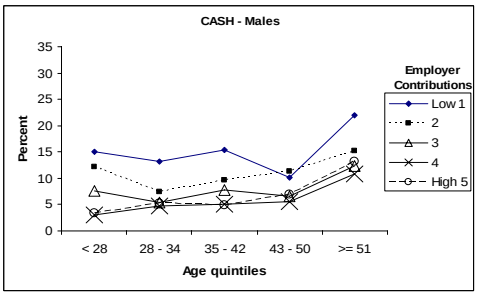
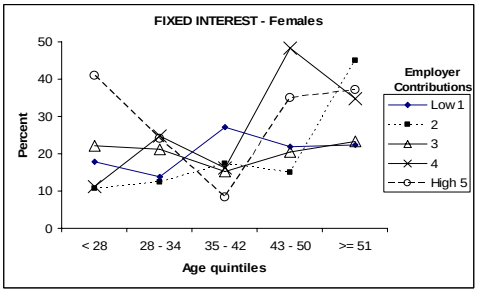


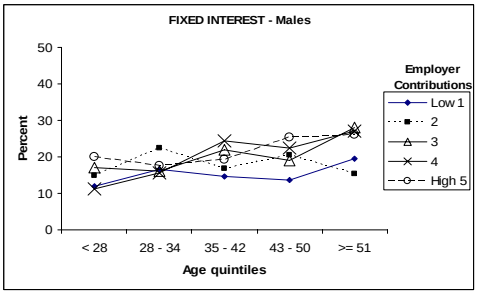
Table 6 Conservative Asset Class Allocations by Age Profile and Employer Contribution Level

STA Asset Allocations for DIY Option
Females = 462, Males = 2202, Total =2664
Employer Contributions Quintiles:
Low 1 (0-819), 2 (820-2008), 3 (2009-3515),4 (3516-5947), High 5 (5948-94144)

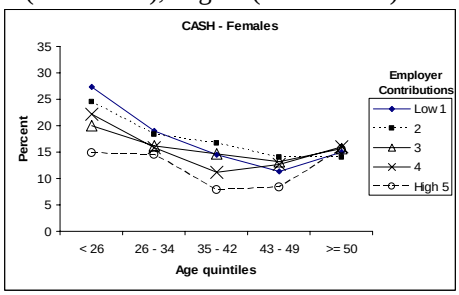


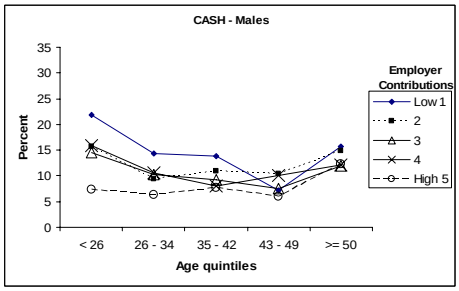


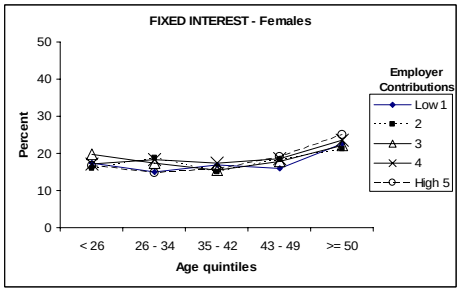


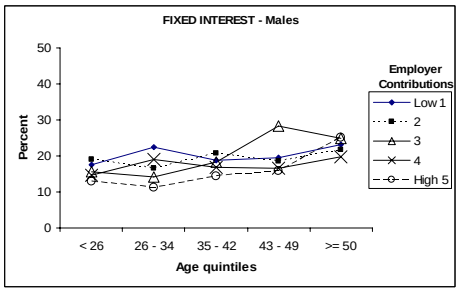


HESTA Asset Allocations for DIY Option
Females: 8127, Males:2831, Total: 10958
Employer Contributions Quintiles:
Low 1 (0-493), 2 (494-1283),3(1284-2222), 4 (2223-3693), High 5 (3694-91000)

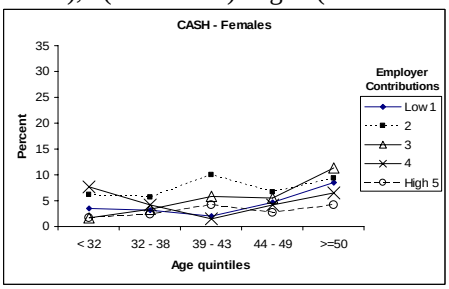


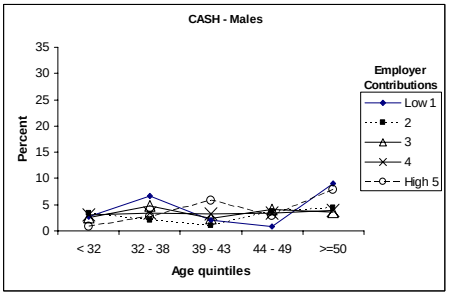


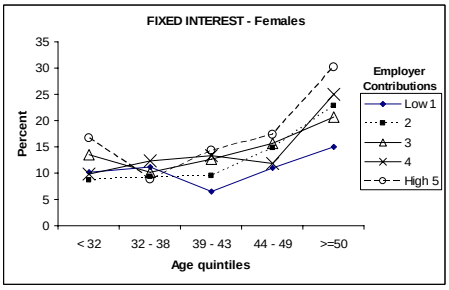




GESB Asset Allocations for DIY Option
Female:1546, Males:1533, Total: 3079
Employer Contributions Quintiles:
Low 1 (0-1722) 2(1723-3342),3 (3343-4422),4 (4423-5341) High 5(5342-28167)







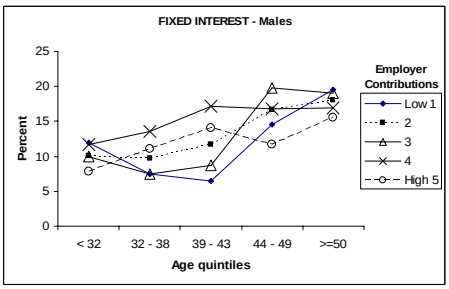


Table 7 Aggressive Asset Classes Allocation by Age Profile and Employer Contribution Level

STA Asset Allocations for DIY Option
Females = 462, Males = 2202, Total =2664
Employer Contributions Quintiles:
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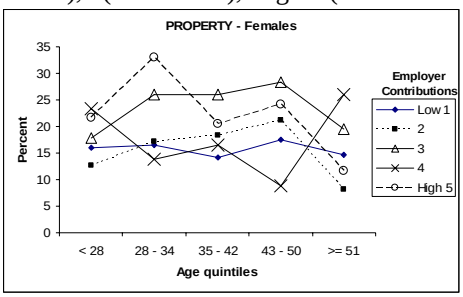

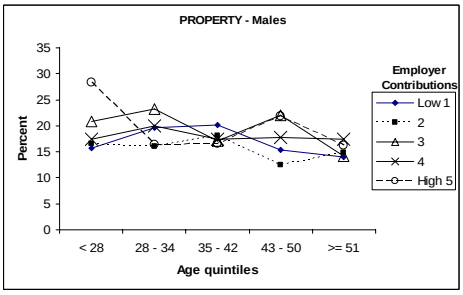

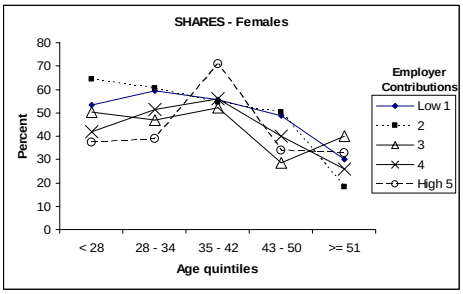

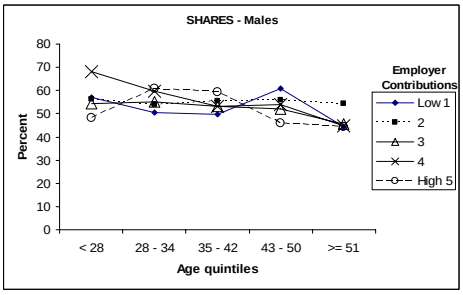

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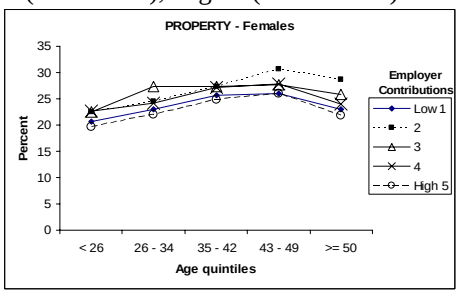
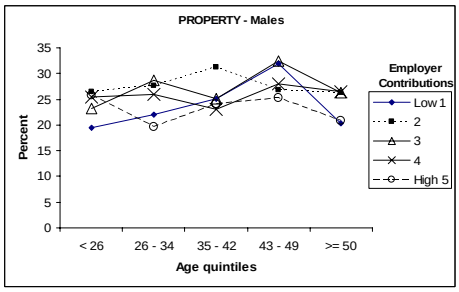
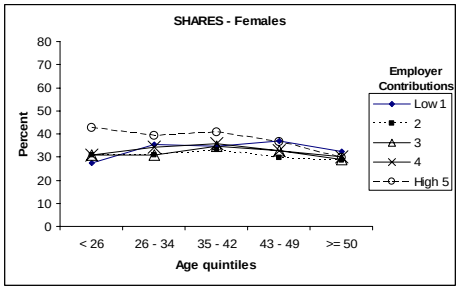
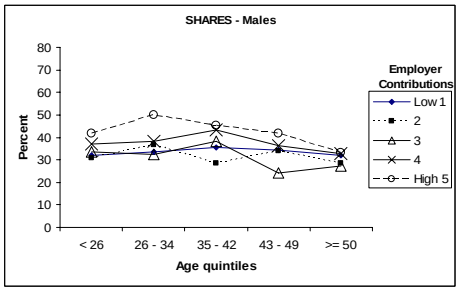
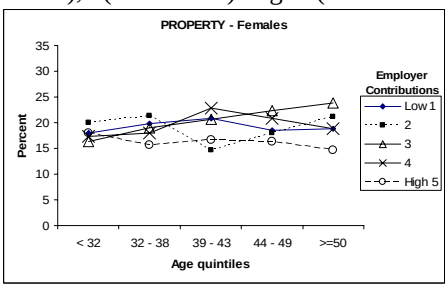


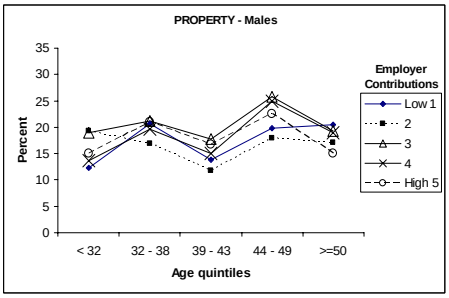


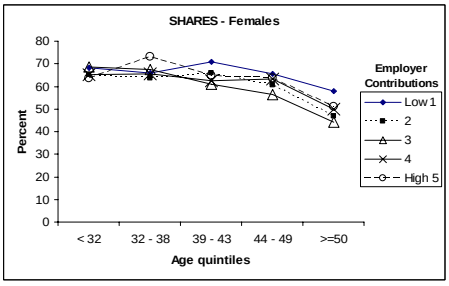




GESB Asset Allocations for DIY Option
Female:1546, Males:1533, Total: 3079
Employer Contributions Quintiles:
Low 1 (0-1722) 2(1723-3342),3 (3343-4422),4 (4423-5341) High 5(5342-28167)







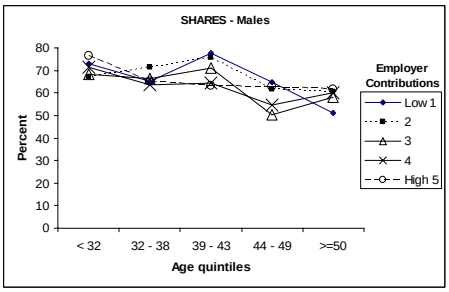


Table 8 Choice Breakdown by Calendar Year

This table indicates the percentage of investment strategy changes made by members of each fund disaggregated by the change number. That is, whether the decision was the first, second, third or fourth change made by the member.

Change Number	2001	2002	2003	2004	Total
		STA			
1	90	92	86	68	18542
2	7	6	10	21	2617
3	2	1	3	9	916
4	0	0	1	3	312
Total	2487	6588	6737	6575	22387
		HESTA			
1	90	96	93	87	39756
2	8	3	5	9	2765
3	2	1	1	3	802
4	0	0	0	1	312
Total	3587	8836	16494	14718	43635
		GESB			
1	98	78	67	64	17605
2	1	17	24	19	1432
3	0	3	5	9	351
4	0	1	2	2	110
Total	13472	2098	2309	1619	19498