

Scobie, Grant M; Le, Trinh

**Working Paper**

## The Impact of Workplace and Personal Superannuation Schemes on Net Worth: Evidence from the Household Savings Survey

New Zealand Treasury Working Paper, No. 04/08

**Provided in Cooperation with:**

The Treasury, New Zealand Government

*Suggested Citation:* Scobie, Grant M; Le, Trinh (2004) : The Impact of Workplace and Personal Superannuation Schemes on Net Worth: Evidence from the Household Savings Survey, New Zealand Treasury Working Paper, No. 04/08, New Zealand Government, The Treasury, Wellington

This Version is available at:

<https://hdl.handle.net/10419/205548>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

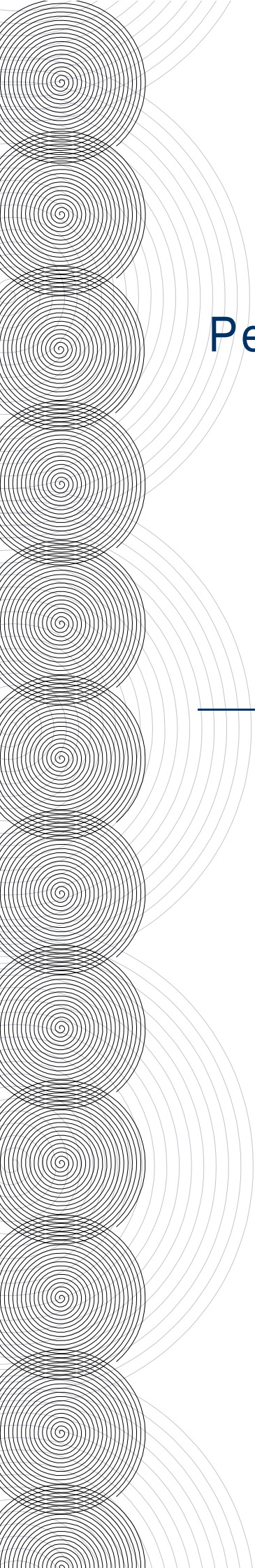
*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



<https://creativecommons.org/licenses/by/4.0/>



# The Impact of Workplace and Personal Superannuation Schemes on Net Worth: Evidence from the Household Savings Survey

Grant M Scobie and Trinh Le

---

NEW ZEALAND TREASURY  
WORKING PAPER 04/08

JUNE 2004



THE TREASURY  
Kaitohutohu Kaupapa Rawa

**MONTH/YEAR**

June, 2004

**AUTHOR/S**

Grant M Scobie  
New Zealand Treasury  
PO Box 3724  
Wellington 6015  
New Zealand  
Email Grant.scobie@treasury.govt.nz  
Telephone +64 4 471 5005  
Fax +64 4 473 0982  
Trinh Le  
Department of Economics  
University of Canterbury  
Private Bag 4800  
Christchurch  
Email trinh.le@canterbury.ac.nz  
Telephone +64 3 364 2987 ext 7622  
Fax +64 3 364 2635

**ACKNOWLEDGEMENTS**

Valuable guidance and suggestions were received on an earlier draft from Michael Littlewood, Geoff Lewis, Bob Buckle, David Feslier, John Creedy, Roger Hurnard, Brian McCulloch, John Bryant, Brock Jera and participants in seminars at the Treasury, the Office of the Retirement commissioner, the Investment and Savings Industry and the Association of Superannuation Funds of New Zealand. The authors are grateful to Vance Arkinstall (ISI) and Bruce Kerr (ASFONZ) for arranging for presentations of an earlier draft. Dean Hyslop and John Gibson provided valuable guidance on the econometric testing. Work by the Treasury on analysing the Household Savings Survey has been undertaken with the support of the Office of the Retirement Commissioner, and the authors are indebted to David Feslier for his interest and support. John Gibson played a major role in the research project from which this paper is drawn.

The authors are grateful to Statistics New Zealand for their collaboration in providing access to the data, and in particular to Tanya Randall, Jason O'Sullivan and Peter O'Brien. Access to the data used in this study was provided by Statistics New Zealand in a secure environment designed to give effect to the confidentiality provisions of the Statistics Act, 1975. The results in this study and any errors contained therein are those of the authors, not Statistics New Zealand.

**NZ TREASURY**

New Zealand Treasury  
PO Box 3724  
Wellington 6015  
NEW ZEALAND  
Email information@treasury.govt.nz  
Telephone 64-4-472 2733  
Website www.treasury.govt.nz

**DISCLAIMER**

The views, opinions, findings, and conclusions or recommendations expressed in this Working Paper are strictly those of the author(s). They do not necessarily reflect the views of the New Zealand Treasury. The Treasury takes no responsibility for any errors or omissions in, or for the correctness of, the information contained in these working papers. The paper is presented not as policy, but to inform and stimulate wider debate.

# Abstract

---

The central question addressed in this paper is: does having a workplace or personal superannuation scheme result in a higher level of accumulation for retirement? The paper presents a range of information about the participation and level of holdings in workplace and personal superannuation schemes based on data from the Household Saving Survey (HSS). While the proportion of people holding a scheme is small (around 10%), the value of a scheme for those enrolled represents about one third their total net worth. There is evidence that being enrolled in a workplace scheme is associated with higher levels of total net worth, yet this is not true of personal schemes, once several personal characteristics have been controlled for. Nevertheless, it is evident that those in either workplace schemes or personal have not fully substituted this form of saving for other vehicles. In fact in all cases there appears to be complementarity, whereby higher holdings in a scheme are associated with higher holdings in other forms of savings. Typically, an additional dollar invested in a workplace scheme is associated with higher total net worth of between one and two dollars, while for personal schemes the figure typically exceeds two dollars. Two possible explanations for this arise. The first is that by enrolling in a scheme an individual acquires heightened awareness of the importance of retirement saving and saves additional amounts in other vehicles. An alternative hypothesis is that there may be some self-selection bias; those who have enrolled might be more inclined to save than the population as a whole. There is no direct way to use the data to discriminate between these two possibilities. However holding constant a wide range of other factors (including age, income, ethnicity, residence, etc) it is reasonable to suppose that the more likely sources of selection bias may have been controlled for. If this is the case then the finding that more holdings of workplace superannuation are associated with greater total retirement wealth may well have arisen from an “awareness” or “recognition” effect of belonging to a scheme. In this event, policies which foster enrolment might lead to greater retirement accumulation by those in a scheme.

**JEL CLASSIFICATION** J26 – Retirement

**KEYWORDS** Superannuation; Retirement; New Zealand; Net Worth; Saving; Household Behaviour

# Table of Contents

---

<b>Abstract</b> .....	<b>i</b>
<b>Table of Contents</b> .....	<b>ii</b>
<b>List of Tables</b> .....	<b>ii</b>
<b>1 Introduction</b> .....	<b>1</b>
<b>2 Data and Definitions</b> .....	<b>2</b>
2.1 Employer (Workplace) Superannuation Schemes .....	2
2.2 Personal Superannuation Schemes .....	2
<b>3 The effect of belonging to a superannuation scheme on total net worth</b> .....	<b>2</b>
<b>4 Do those enrolled in super schemes substitute them for other forms of saving?</b> .....	<b>5</b>
4.1 Some International Evidence .....	5
4.2 Tests of the Substitution Effect .....	6
<b>5 Discussion</b> .....	<b>10</b>
<b>6 Conclusions</b> .....	<b>14</b>
<b>References</b> .....	<b>17</b>
<b>Appendix A: Descriptive Results from the Survey</b> .....	<b>19</b>
<b>Appendix B: Full Regression Results</b> .....	<b>25</b>

## List of Tables

---

Table 1 - Effect of superannuation schemes on net worth for individuals .....	4
Table 2 - Effect of superannuation schemes on the net worth of couples .....	4
Table 3 - Is a super scheme a substitute or a complement to other forms of retirement saving for individuals? .....	9
Table 4 - Is a super scheme a substitute or a complement to other forms of retirement saving for couples?.....	9
Table 5 - The impact on total net worth associated with an additional \$1 invested in workplace or personal superannuation schemes .....	10
Appendix Table 1- Unpartnered individuals who have either a workplace or personal superannuation scheme (Number and Percentage).....	19
Appendix Table 2- Holdings and value of workplace or personal superannuation schemes by unpartnered individuals: by gender.....	19
Appendix Table 3 - Couples who have either a workplace or personal superannuation scheme (Number and Percentage).....	20
Appendix Table 4 - Median Values of net worth and workplace superannuation for unpartnered individuals by quintiles of net worth.....	21
Appendix Table 5 - Mean values of net worth and value of workplace superannuation scheme for unpartnered individuals by quintiles of net worth.....	21
Appendix Table 6 - Median values of net worth and workplace superannuation for couples by quintiles of net worth .....	22
Appendix Table 7 - Holdings of workplace schemes: by age and gender.....	22
Appendix Table 8 - Median values of net worth and superannuation schemes .....	23
Appendix Table 9 – Regression results – testing whether a super scheme is a substitute or a complement to other forms of retirement saving for individuals .....	25
Appendix Table 10 – Regression results – testing whether a super scheme is a substitute or a complement to other forms of retirement saving for couples.....	26

# The Impact of Workplace and Personal Superannuation Schemes on Net Worth: Evidence from the Household Savings Survey

## 1 Introduction

---

There is an ongoing debate, both in New Zealand and overseas, about the adequacy of saving. This can be addressed at two levels: at the aggregate level of total savings in the economy; and at the level of individual households where the principal focus is on accumulation for retirement. This paper is concerned solely with the latter and does not address broader issues of saving in the economy. In particular it focuses on one aspect of retirement wealth accumulation: that of workplace and personal superannuation schemes. The recent Periodic Review Group (2003) considered that there would be value in promoting greater use of workplace savings schemes and recommended that the Government establish a body to develop recommendations.

The central question addressed in this paper is: does having a workplace or personal superannuation scheme result in a higher level of accumulation for retirement? A related question is: to what extent do those who have such schemes fully offset their savings in the scheme by correspondingly lower savings in other vehicles; ie, is there evidence of substitution for other forms of saving, after allowing for differences in personal characteristics?

To address these questions we draw on evidence from the Household Savings Survey (HSS) conducted in 2001.<sup>1</sup> The definitions of the schemes are set out in Section 2. The basic results from the survey are summarised in Appendix A. In Section 3, the results of statistical tests of the effect of participation on total net worth are presented. This is followed by results which report on tests designed to determine whether those enrolled in superannuation schemes substitute them for other forms of saving (Section 4). Discussion and conclusions follow in Sections 5 and 6.

---

<sup>1</sup> See Statistics New Zealand (2002).

## 2 Data and Definitions

---

The data for this study are drawn from the Household Savings Survey conducted in 2001. This survey collected information on the assets and liabilities for unpartnered individuals and couples. From this it was possible to estimate their total net worth.<sup>2</sup> No allowance has been included for human capital. Information was collected about superannuation schemes where the respondent was not yet receiving payments. These schemes could be either a personal scheme (sometimes referred to as retail schemes) or schemes operated through the person's employer. A person could hold either or both types of schemes. If the respondent was partnered, information was collected separately on the schemes held by each member of the couple.

### 2.1 Employer (Workplace) Superannuation Schemes

These are schemes (either defined benefit or defined contribution) where the respondent's employer made a financial contribution to a retirement account held in the employee's name. Workplace schemes do not include those where the employer merely makes a payroll deduction and facilitates the transfer to an account held by the employee.

In the case of defined benefit schemes, the information was provided to the Government Actuary who made an estimate of the value of the scheme. For defined contribution schemes, the respondent was asked to estimate the value of the scheme if it were cashed in on the day of the interview.<sup>3</sup>

### 2.2 Personal Superannuation Schemes

These are schemes to which the employer made no contribution. The respondent was asked to estimate the value of the scheme if it were cashed in on the day of the interview.

In summary, information is available from the HSS for the respondent (and the respondent's partner if in a couple) as to whether they had a personal or employer-based superannuation scheme and if so, its value. It is not possible to identify whether the participation in the workplace scheme was voluntary or whether the enrollee joined at a time when participation was obligatory. Nor is it possible to identify whether the employer of a participant in a personal scheme provided access and facilitated the transfer of contributions through payroll deductions.

## 3 The effect of belonging to a superannuation scheme on total net worth

---

This section presents the results of a series of statistical tests to assess whether belonging to a scheme is associated with higher total net worth.

What effect does being enrolled in a scheme have on an individual's total net worth? Is it higher for those with a super scheme, holding constant other characteristics of the

---

<sup>2</sup> The term net worth is used to describe the total accumulated wealth of an individual or a couple at the time of the survey. From the HSS we obtained the value of net housing equity, financial assets net of liabilities and the value of pensions (both workplace and personal schemes). The sum of these items is referred to by Statistics New Zealand (2002) as net worth.

<sup>3</sup> Arguably, this would tend to understate the value of schemes where the member was not fully vested in the employer's contributions.



individuals? This test must compare those at the same income, age, gender, ethnicity, level of education, geographic location, partnering status, migrant status, income, and main source of income.

There are two possible reasons why we might observe those having a super scheme holding higher total net worth. In the first place it might be that as a result of belonging to a scheme, the person acquires a heightened awareness of the need for saving and increases his or her holdings in other savings vehicles; ie belonging to a scheme “causes” higher total net worth. Alternatively it maybe that we observe those with super schemes having higher net worth because they are “different” in some respect, over and above any observed characteristics for which we can account (age, ethnicity, education, income, main source of income, etc). In other words, they have some inherent trait which leads them to have greater accumulations of retirement wealth in various vehicles. This is in effect a problem of omitted variables. Had we been able to measure and account for all personal traits that affected savings decisions, then arguably we might not observe any remaining differences in wealth accumulation beyond those arising by random chance.

To conduct this test we fitted a regression equation with total net worth as the dependent variable, and a dichotomous variable for belonging to a scheme or not as an independent variable. We included a set of conditioning variables for whose effect we wish to control. Formally:

$$NW_i = \alpha + \beta_1(D_i) + \sum_2^n \beta_j Z_{ij} + \varepsilon_i$$

where:

$NW_i$  = Total net worth of the i-th individual

$D_i$  = 1 if the person or couple has a superannuation scheme (workplace or personal);  
0 otherwise

$Z_{ij}$  = a set of independent variable for personal characteristics (eg age, ethnicity, education, region, income, main source of income etc);<sup>4</sup>

$\varepsilon_i$  = a random error term.-

The results for individuals are shown in Table 1. Only the coefficients for the presence of a scheme are reported. The coefficients are an estimate of the additional net worth associated with belonging to a scheme. In the case of workplace pension, individuals having a scheme have \$69,000 more of total net worth than those who are not enrolled. The comparison is for people of a comparable age, education, ethnicity, income, etc. We also control for gender and partnering status but neither variable is significant.<sup>5</sup> These results can be interpreted as follows: there is a 66% chance that the true (but unknown) effect in the population lies between \$51,000 and \$87,000.

<sup>4</sup> Age of both the respondent and partner (if a couple) is allowed for as a linear, squared and cubic term; income as a linear and squared term; education is measured by years of schooling plus post schooling training for both the respondent and the partner and ethnicity classified into two groups (Pakeha and non-Pakeha which includes Maori, Pacific Islander, Asian, and “Other”).

<sup>5</sup> Similar results were obtained when we interacted the gender and partnering dummies with other explanatory variables. See Appendix Table 9 for a complete listing of the control variables.

**Table 1 - Effect of superannuation schemes on net worth for individuals**

Regression	Number of variables	R <sup>2</sup>	Explanatory Dummy Variable	No. of obs with dummy=1	Coefficient	t-value
1	18	0.29	Has a workplace super scheme	583	69,190	3.82***
2	18	0.28	Has a personal super scheme	880	10,074	0.86
3	19	0.29	{ Has a workplace super scheme Has a personal super scheme	{ 583 880	{ 70,050 13,254	{ 3.89*** 1.15

Note: The coefficients are from regressions of net worth on a constant and a set of explanatory variables, based on a sample of 8356 individuals. In regression 3, we included two separate dummy variables for the type of scheme. The t-statistics are based on the test of the hypothesis that the coefficient is different from zero. \*\*\*Significant at the 1% level.

A net worth increase of \$10,000 in favour of those enrolled is also found for personal schemes, but it is statistically insignificant. It appears that the effect of personal pension scheme membership and that of workplace scheme membership reinforce each other; both have positive effects. Furthermore, when we include the two membership dummies in one regression (see regression 3, Table 1), the coefficients and the degree of statistical significance actually increase.

A similar series of tests were made for couples to estimate the effect of belonging to a superannuation scheme. The results are summarised in Table 2. In the first place we considered the case where either partner was in a scheme. These results are given in the lines denoted 1 and 3 for workplace and personal schemes respectively. The key finding is that if either partner has a workplace scheme, then the total net worth of the couple is almost \$90,000 more than for couples in which neither partner has a workplace scheme. This result is statistically significant. In contrast there is no evidence that when either partner belongs to a personal scheme total net worth is increased relative to similar couples in which neither partner has a personal scheme. In fact here the difference is negative; ie, when at least one partner belongs to a personal scheme, the couple's net worth is lower than when neither has a personal scheme. However the estimated effect is not significantly different from zero, implying that there is no evidence of an effect on total net worth among couples of belonging to a personal scheme.

**Table 2 - Effect of superannuation schemes on the net worth of couples**

Regression n	Number of variables	R <sup>2</sup>	Explanatory Dummy Variable	No. of obs with dummy=1	Coefficient t	t-value
1	19	0.28	Either partner has a workplace super scheme	445	+86,198	2.0**
2	20	0.28	{ Respondent has a WP super scheme, and Partner has a WP super scheme	{ 242 232	{ +14,923 +138,214	{ 0.53 1.78*
3	19	0.27	Either partner has a personal super scheme	573	-13,561	0.54
4	20	0.27	{ Respondent has a personal super scheme, and Partner has a personal super scheme	{ 375 322	{ +10,929 -45,181	{ 0.39 1.88*

Note: The coefficients are from regressions of net worth on a constant and a set of explanatory variables, based on a sample of 2982 couples. The t-statistics are based on the test of the hypothesis that the coefficient is different from zero. The regression numbers are included to indicate where more than one of the explanatory variables was included in the same regression model. In Regressions 1 and 3, only one dummy variable was included, while in Regressions 2 and 4 two dummy variables are included. \*Significant at the 10% level. \*\*Significant at the 5% level.

These models were then rerun this time including separate variables to capture whether the respondent or the partner was enrolled in a scheme. The results presented in Table 2 in the lines denoted 2 and 4. In each case there is a separate coefficient estimated for the respondent and the partner. In the case of workplace schemes, couples in which the partner (who could be male or female) belongs to a scheme appear to have much higher total net worth. The difference is almost \$140,000, and this estimate is reasonably significant, though the estimates have a wide confidence interval. In this case there is a 66% chance that the true difference lies in the range of \$60,000 to \$215,000. These wide limits reflect the fact that there is considerable variability in the underlying data. By contrast, in the case of personal schemes a similarly significant impact is found for scheme participation by the partner, yet this effect has a negative sign.

This section has considered whether or not membership in a scheme is associated with higher total net worth. While not overwhelming, the findings are that especially for workplace superannuation, both couples and individuals in a scheme have higher total net worth than comparable economic units who are not members of a scheme. The question then arises: do those who enrol in a scheme have higher total net worth because they also accumulate more in other forms of saving? We turn to this question in the following section.

## 4 Do those enrolled in super schemes substitute them for other forms of saving?

---

A central question is whether or not those who enrol in a workplace or personal superannuation scheme simply substitute these schemes for other forms of saving; if so, then we would expect little or no addition to net household wealth, rather a rearrangement of portfolios. Certainly, based on the findings of the previous section we would be inclined to conclude that in some cases there is less than complete substitution, and hence total net worth is actually greater for members relative to non-members. The purpose of this section is to formally test that proposition. In this section we first review some findings from the international literature (Section 4.1); we then present the results of tests for New Zealand based on the Household Savings Survey (Section 4.2).

### 4.1 Some International Evidence

In one of the earliest studies, Cagan (1965) explored the effect of belonging to an employer-provided (ie, workplace) pension scheme on personal saving. He reported that those in workplace schemes saved more in other forms and attributed this to a “recognition effect”. The workplace scheme was seen to raise awareness of the need to save for retirement and hence those covered in the workplace scheme tended to save more in other forms of retirement wealth accumulation.

Subsequent research was based on the notion of expected pension wealth; ie, it is argued that the relevant concept is not whether a person belongs to a scheme, nor even the current value of the scheme, but rather the expected value by the time of retirement. The difficulty of course is that considerable uncertainty surrounds this expected value, as it will be influenced by future health status, time to retirement, future income, bequests, etc.

Munnell (1976) found a substantial effect, with expected pension wealth reducing private savings by as much as 62 cents for each dollar of expected pension wealth. “The results

clearly indicate that, in contrast to earlier work of Cagan and Katona and others, pension coverage reduces savings in other forms” (p.1013). In summarising other studies Venti and Wise (1996) write:

“Blinder, Gordon and Wise (1981), Hubbard (1985), and Avery, Elliehausen and Gustafson (1986) however, find little or no evidence of a tradeoff. Diamond and Hausman (1984) find a modest tradeoff. Thus these findings would suggest that the tradeoff is far from dollar for dollar and the consensus view appears to be little or no effect” (p.26).

In their own study Venti and Wise (1996) for the USA report that typically they find a tradeoff, with a dollar of additional pension wealth being associated with 4 to 19 cents less of personal financial assets in 1991. However almost none of these results is statistically different from zero. They conclude that

“...there is unlikely to be much if any substitution of personal financial saving for employer-provided pension entitlement” (p.25). “This should not be interpreted to mean that employer pensions have no effect on individual behavior. It seems apparent that employer pensions together with Social Security have led to dramatic declines in typical retirement ages and the labour force participation of older Americans. Thus even if pensions have not reduced the amount employees save in other forms, they surely have reduced the amount older persons earn” (pp.28-29).

## 4.2 Tests of the Substitution Effect

In this section we construct a formal test of whether those who are enrolled in a super scheme (either employer based or personal) substitute saving in these schemes for other forms of saving. In other words if a person contributes say \$100 per month to a workplace scheme, is it the case that they reduce the savings they hold in other forms of retirement accumulation by a comparable amount? If the costs of subscribing to all schemes were approximately equal, and if the expected returns, rules of the plan and degree of risk were similar across schemes, then there would be no reason to suppose that people would not substitute, reducing commensurately their holdings in other vehicles. This proposition follows from the life cycle hypothesis of consumption and saving, which would suggest that individual savings depend, among other things, on the income that people expect to receive in retirement from both public and private pension schemes.

We exploit the cross sectional variation in the data to estimate the relation between the net worth and the value of holdings in a super scheme. To account for the possibilities that this relationship varies from males to females and from unpartnered to partnered individuals, we include dummies for gender and partnering status, as well as interacting these dummies with the value of the pension scheme in question. In the regression analysis, attention centres on the estimated coefficient on the variable representing the value of holdings in the super scheme (VS) and the differential slope coefficients in the following regression model:

$$ANW_i = \alpha_1 + \alpha_2 D_{1i} + \alpha_3 D_{2i} + \beta_1 VS_i + \beta_2 (D_{1i} VS_i) + \beta_3 (D_{2i} VS_i) + \sum_{j=4}^n \beta_j Z_{ij} + \varepsilon_i$$

where:

$ANW_i$  = Total net worth adjusted by subtracting the value of holdings in the super scheme for the  $i$ -th individual;

$D_1$  = 1 for males, 0 otherwise;

$D_2$  = 1 for partnered individuals, 0 otherwise;<sup>6</sup>

$VS_i$  = the value of holdings in the super scheme (either workplace or personal);

$Z_{ij}$  = a set of independent variable for personal characteristics of the individual (eg age, ethnicity, education, region, income, main source of income etc);<sup>7</sup>

$\varepsilon_i$  = a random error term.

If the slope ( $\beta_1$ ) is equal to -1.0, then any additional holdings in a super scheme would be fully offset by lower holdings in other savings vehicles. This is the case of complete substitution. If in contrast, the slope were negative but between zero and minus one, then there would be partial substitution. Finally there is the possibility that the slope might be positive, indicating complementarity. In this third case additional amounts in a super scheme are accompanied by additional amounts saved in other forms as well.

It is important to control for the effect of variables that could result in a spurious relation between adjusted net worth and the value of holdings in a personal or workplace scheme. As Venti and Wise (1996) note:

“...both pension wealth and personal financial asset saving will increase with income, thus without controlling for income persons with greater personal financial wealth will almost certainly have greater pension wealth as well.” (p.24)

In the previous section, the finding that in some cases people who hold a super scheme have higher net worth, all else equal, provides evidence that they have not completely substituted scheme holdings for other forms of saving. We now formally test for the effect of a super scheme on the holdings in other forms, by estimating the above regression model. The value of both workplace and personal schemes was tested separately. In the earlier results which tested for the effect of membership we included all observations in the sample; ie both those who had and those who did not have a superannuation scheme. To test the extent of substitution, only those people holding a scheme were included in the sample for estimating the regressions.

<sup>6</sup>  $D_1$  and  $D_2$  are only applicable to regressions on individuals. A possible refinement to this model would be to interact each of the dummy variables ( $D_1$  and  $D_2$ ) with each of the explanatory variables in the vector  $Z$ . In principle this would have allowed for the effect on net worth of say, migrant status, to differ between partnered and unpartnered individuals and males and females. In fact we did do this and run the extended model with all interactions, amounting to a total of 53 variables. It was found that almost all the interaction effects were highly insignificant and the overall explanatory power of the model as measured by the  $R^2$  was hardly increased. For this reason we pursued the simpler model without interaction terms.

<sup>7</sup> Age of both the respondent and partner (if a couple) is allowed for as a linear, squared and cubic term; income as a linear and squared term; education is measured by years of schooling plus post schooling training for both the respondent and the partner and ethnicity classified into two groups (Pakeha and non-Pakeha which includes Maori, Pacific Islander, Asian, and “Other”).

To assess the robustness of the results, we have tried several estimators (OLS, OLS excluding outliers, median regressions, robust regressions, and log-linear form<sup>8</sup>). It appears that the results vary considerably across specifications. However, we have chosen to focus the discussion on the log-linear regressions, since from diagnostic tests and visual inspection of the residual plots this functional form appeared superior to others.<sup>9</sup> Besides, the estimate of  $\beta_1$  from the log-linear regression measures the elasticity of the superannuation scheme value with respect to wealth holdings in other forms. In theory, these elasticity estimates convey more economically meaningful interpretations than absolute dollar estimates, since the marginal effect of an additional dollar spent on a superannuation scheme for someone who has a net worth of, say, \$10,000 is not the same as that for someone who holds ten times as much wealth.

The results are summarised in Tables 3 and 4. In each panel, the estimate of  $\beta_1$  is reported, along with the estimates of the differential slope coefficients  $\beta_2$  and  $\beta_3$  for regressions on individuals. If the slope is negative, there is some substitution between the scheme and other forms of saving. If the slope is positive then there is complementarity, and greater investment in a workplace or personal scheme is associated with greater total net worth in some or all other forms of wealth accumulation (housing, shares, bank deposits, rental property, farms or businesses, etc). The remaining rows show the number of observations that were included and an adjusted R-squared statistic which measures the goodness of fit of the regression.

Table 3 presents the results for individuals. The Household Saving Survey provides information on assets and liabilities for unpartnered individuals and for couples. However, it was necessary to estimate the net worth of those individuals who identified as being partnered (ie part of a couple). To do this, we identified the persons in a couple and assigned to them 50% of all the net worth of the couple, with the exception that we allowed for separate information for each partner on their individual student loans and the value of their individual holdings in super schemes. The results shown for individuals were obtained by pooling the data for unpartnered individuals and individuals in couples.

For individuals, are super schemes a substitute for other forms of saving? The answer appears to be no. In the case of workplace superannuation, the estimated coefficient of the scheme value on the net worth in other forms is 0.25 for unpartnered females, indicating that higher savings in the form of workplace superannuation for these people are associated with a 25% increase in other wealth. The corresponding effect is higher (0.32) for personal schemes. For both types of schemes, the effect is halved for partnered individuals and is further reduced for males, so that the impact on other type of net worth of holding a workplace pension scheme is almost zero for partnered males. In every case for both workplace and personal schemes, the estimates are significantly greater than -1, thereby rejecting the hypothesis of complete substitution.

---

<sup>8</sup> Where the adjusted net worth and the value of the superannuation scheme enter the equation in logarithms rather than in levels.

<sup>9</sup> The log-linear regressions give considerably higher R-squared values, more individually statistically significant t-ratios, as well as the most “well-behaved” residuals. These merits are, however, somewhat compromised by the fact that observations with negative or zero net worth drop out, as a result of the logarithmic transformation. Results from alternative specifications are available from the authors upon request.

**Table 3 - Is a super scheme a substitute or a complement to other forms of retirement saving for individuals?**

	Value of Workplace Super scheme	Value of Personal Super scheme
Slope coefficient $\hat{\beta}_1$ (reference group: unpartnered females)	<b>0.25</b>	<b>0.32</b>
t-value	4.74***	6.51***
Differential slope coefficient $\hat{\beta}_2$ (males)	<b>-0.14</b>	<b>-0.06</b>
t-value	2.48**	1.23
Differential slope coefficient $\hat{\beta}_3$ (partnered)	<b>-0.12</b>	<b>-0.16</b>
t-value	2.19**	3.08***
Sample size	553	835
Adjusted R-squared	0.52	0.40

Note: The coefficients are from regressions of net worth on a constant and a set of 21 explanatory variables, based on a sample of those people who are enrolled in a superannuation scheme. Adjusted net worth and value of the superannuation scheme enter the equation in logarithms rather than in levels. The t-statistics are based on the test of the hypothesis that the coefficient is different from zero. \*\*Significant at the 5% level. \*\*\*Significant at the 1% level. The  $\beta_1$  coefficients are also significantly different from -1 at the 1% level. For full regression results, see Appendix Tables 9.

The final set of results is for couples (Table 4), where the models were estimated using the combined value of the holdings in workplace or personal schemes. The results show that there is a positive relation between the amount held in either workplace or personal super schemes and the value of other net worth; ie, the more a couple has in a super scheme of either type, the more they tend to have in other forms of wealth. This result corresponds to the case of complementarity rather than substitution. The effect is strikingly similar between the two types of schemes. More specifically, a 10% increase in holdings of either workplace or personal super is associated with a 1% increase in other net worth. These estimates also significantly differ from -1, which allows us to conclude that the hypothesis of complete substitution can be rejected.

**Table 4 - Is a super scheme a substitute or a complement to other forms of retirement saving for couples?**

	Value of Workplace Super scheme	Value of Personal Super scheme
Slope coefficient $\hat{\beta}_1$	<b>0.09</b>	<b>0.11</b>
t-value	2.70***	3.43***
Sample size	422	552
Adjusted R-squared	0.42	0.32

Note: The coefficients are from regressions of net worth on a constant and a set of 19 explanatory variables, based on a sample of those couples with at least one partner enrolled in a superannuation scheme. Adjusted net worth and value of the superannuation scheme (total held by both partners combined) enter the equation in logarithms rather than in levels. The t-statistics are based on the test of the hypothesis that the coefficient is different from zero. \*\*\*Significant at the 1% level. These coefficients are also significantly different from -1 at the 1% level. For full regression results, see Appendix Table 10.

The estimates of the slope coefficients ( $\beta_i$ ) from the log-linear regressions in Tables 3 and 4 can be read directly as elasticities. In each case they show the percentage change in net worth (excluding superannuation) of a given percentage change in the holdings of

superannuation. An alternative way to interpret these estimates is to convert them to absolute changes. This involves a simple adjustment described below.

In general an elasticity is defined as  $\eta = (\partial Y / \partial X).(X / Y)$  where in this case:

Y = the value of total net worth excluding the value of holdings in workplace or personal superannuation; and

X = the value of holdings in workplace or personal superannuation.

The marginal impact on total net worth of a dollar invested in superannuation schemes is then found as  $\partial Y / \partial X = [\eta / (X / Y)] + 1$  where the effect has been evaluated at the median ratio of (X/Y), and the term +1 is included so as to capture the effect on total net worth rather than on just net worth in vehicles other than superannuation schemes. The results are reported in Table 5.

The striking feature is that in all but one case the effect is greater than unity. In other words, these results lead to the conclusion that an additional dollar invested in superannuation schemes is associated with a more than proportionate and significant increase in total net worth. There is no substantial evidence that those contributing to such schemes do so by reducing their holdings in other vehicles. The effect is strongest for unpartnered males in personal schemes.

**Table 5 - The impact on total net worth associated with an additional \$1 invested in workplace or personal superannuation schemes**

	Workplace		Personal	
	Elasticity	Marginal dollar effect	Elasticity	Marginal dollar effect
<i>Individuals</i>				
-Unpartnered females	0.25	\$ 1.74	0.32	\$ 3.00
-Unpartnered males	0.11	\$ 2.10	0.26	\$ 5.33
-Partnered females	0.13	\$ 1.81	0.16	\$ 2.14
-Partnered males	-0.01	\$ 0.98	0.10	\$ 1.50
<i>Couples</i>	0.09	\$ 1.47	0.11	\$ 2.00

Notes: In the case of couples the combined holdings of the partners in either workplace or personal superannuation has been used. The estimates of the impact are derived by taking the regression coefficients from the log-linear model and dividing by the median ratio of the holdings of superannuation funds (either workplace or personal) to the total net worth excluding superannuation holdings. Note that to the resulting effect one dollar has been added to get to the total effect.

## 5 Discussion

The central policy question that underlies this analysis of the HSS is: would more widespread use of workplace superannuation schemes increase the total level of retirement wealth of participants?

This question can be broken down into two parts:

- (a) Would the current level of participation be increased by some policy intervention?



- (b) Given that a person has made the decision to participate, does belonging to a workplace scheme lead to a net increase in retirement wealth?

The HSS offers no guidance on the first question. It is possible that through making information available about workplace schemes more employees might be encouraged to sign-up. This assumes that the private providers of superannuation schemes are not offering an adequate level of information at present, an argument which might be difficult to sustain. However, there is evidence that offering the scheme as a default to new employees who would have to write a letter requesting not to be included, may raise the participation rates (Sunstein and Thaler, 2003). Beyond that there is the Australian model where participation is compulsory (Drew and Stanford, 2003).

It may be that because of myopia, people do not in fact save at the rate which would allow them to smooth their consumption through retirement.<sup>10</sup> Only when they eventually retire will they realise that they should have saved more. It is conceivable that by being enrolled as a default in a workplace scheme with automatic payroll deductions, the transaction costs of making a conscious decision to open a retirement account and then meet voluntary monthly payments could be reduced for some people.

Thaler and Benartzi (2001) argue that employees have difficulty making adequate savings commitments and hence save at a level which is less than that which they will subsequently desire.

The employees who fail to join the plan, or who participate at a very low level, appear to be saving at less than the predicted lifecycle savings rates. Behavioral explanations for this behavior stress bounded rationality and self-control and suggest that at least some of the low-saving households are making a mistake, and would welcome an aid to help their saving decision making (p.1).

They propose a scheme whereby people commit in advance to allocate a portion of their future salary increases toward retirement savings. Their key findings are: (1) Most people (78 percent) who were offered the plan elected to use it; (2) virtually everyone (98 percent) who joined the plan remained in it through two pay raises, and the vast majority (80 percent) remained in it through the third pay raise; and (3) The average saving rates for SMT plan participants increased from 3.5 percent to 11.6 percent over the course of 28 months. They conclude that the results suggest that behavioural economics can be used to design effective prescriptive programs for important economic decisions.

Further support for the importance of the design of a savings plan comes from Choi, Laibson and Madrian (2004) who report on experiments with the 401(k) plan offered in the USA under different conditions. When left to decide whether to enrol, in one trial 90% of employees opted not to. However, where they had to make an explicit statement to avoid being enrolled automatically, only 30% failed to enrol. While employees often felt that they could not save more at present, most would agree to save some or all of any future pay rises. In a final experiment the author's found that if employees were given the option to enrol with no deadline, two thirds failed to ever enrol. In contrast, if a deadline was imposed two thirds actually enrolled. They conclude:

We assess the impact of 401(k) plan design on four different 401(k) savings outcomes: participation in the 401(k) plan, the distribution of employee contribution

---

<sup>10</sup> Scobie and Le (2004) present evidence that overall, people do however seem to be saving in a manner consistent with consumption smoothing, although this does not preclude the possibility that some individuals are myopic.

rates, asset allocation, and cash distributions. We show that plan design can have an important effect on all of these savings outcomes. This suggests an important role for both employers in determining how to structure their 401(k) plans and government regulators in creating institutions that encourage or discourage particular aspects of 401(k) plan design.

Results from a New Zealand survey by ACNielsen<sup>11</sup> in 1996 showed that 57% of eligible employees were enrolled in a workplace scheme where this was offered by their employer. In the case of firms not offering a scheme, 58% of all eligible employees said they would participate were such a scheme to be offered by their employer.

We now turn to the second question posed at the beginning of this section. Even if the participation rates were to increase, it does not follow automatically that the new enrollees will accumulate more retirement wealth than that which they would have had in the absence of the scheme. As a starting point one could argue that if people pursue a consumption smoothing objective over the life-cycle, then they will have a target level of saving that they consider necessary to provide an adequate retirement income (Gibson and Scobie, 2003). Assuming there are a number of savings vehicles on offer they will choose those which offer their preferred combination of risk, expected return and flexibility. Were they to enrol in a workplace scheme, it is possible that they would simply adjust the level of savings in other vehicles such that their total rate of accumulation would remain virtually unchanged; ie, in the extreme there could be complete substitution, with no increase in total retirement accumulation. In practice, we would not expect to observe complete substitution as the risk and return properties of different savings vehicles are typically different, implying they are less than perfect substitutes.

The results of this study do, however, provide a fairly solid results on the question of substitution. It was found that couples in which either partner has a workplace superannuation scheme, have a significantly higher level of total net worth, by almost \$90,000. In addition it is found that the median value of holdings by couples in a workplace scheme is around \$40,000. This suggests that couples in which a partner has a scheme have chosen to accumulate funds in workplace superannuation *without making comparable reductions in other forms of saving*. Their median holdings in other forms are in fact comparable to those who have no workplace scheme.

Some caution is needed in drawing policy conclusions from these results. Even in the case where those having a scheme have higher total net worth, this could reflect a self-selection bias. In other words, amongst the total population there are some with a greater proclivity toward saving (the “squirrel” effect), and perhaps it is them who have enrolled in workplace schemes. Belonging to a scheme per se does not raise wealth; rather, it is the unobservable characteristics associated with those who chose to enrol in a scheme that makes them wealthier. Even in the absence of such schemes it is likely they would have had higher accumulations in any event.

If certain people are “squirrels”, and superannuation schemes are not subsidised, we would expect them to save more than those who lack such a proclivity, other things being equal. However there would be no reason to expect that they would systematically save more superannuation schemes. Likewise we would not expect the non-squirrels to systematically avoid superannuation schemes. In other words, “squirrelness” would be associated with the amount of total saving, but not necessarily with its allocation. Yet the

---

<sup>11</sup> As reported by Wendy Stockwell “The Workplace-Employer and Employee Attitudes”, a presentation to the Office of the Retirement Commissioner, Wellington, March, 2004.

data from the HSS show that those in a superannuation scheme are higher savers, suggesting that what we observe in the data is not necessarily due to the squirrel effect where schemes are not subsidised.

In fact we know that by definition the workplace schemes did involve some employer contribution, and it would seem that for many people it would be advantageous to enrol in order to capture this benefit. However, we would expect both squirrels and non-squirrels to respond equally to the incentive of a subsidy, with no systematic relation between holdings in a scheme and higher total wealth. But in fact we do observe such a relationship, again suggesting that we can reject the squirrel hypothesis.

A variant of this argument is to note that randomly making a subsidised scheme available in a subset of workplaces (and hence to a random group of employees) means that the variable “holding a workplace scheme” could be interpreted as exogenously given. This would suggest that the causality runs from “holding a scheme” to “higher net worth”, rather than the other way around, in which those with higher net worth sought out a scheme. This would suggest again that ‘squirrelness’ is not the underlying explanation of the results.

All the workplace schemes in the survey involve an employer contribution. What might be the effect of these contributions to a workplace scheme? In part the answer will depend on whether the employer’s contribution has a subsidy element which is not offset by reduced wages or other benefits. If there is a genuine subsidy this would represent an increase in the total benefit package. In a survey covering 162 firms and 306,000 employees including 78 of New Zealand’s largest 100 employers (Periodic Review Group 2003) 89% of all employees were in workplace plans that involved a subsidy. 50% of the plans subsidised the fees, 40% provided subsidised life and or disability insurance, and 75% made a contribution to retirement savings.

Employer subsidies can be viewed as equivalent to an increase in the interest rate paid by the superannuation scheme relative to other savings vehicles. Like all changes in interest rates there are two opposing effects on saving. The first is to make present consumption dearer relative to future consumption, encouraging less consumption now and an increase in saving; the second constitutes an equivalent income increase which may lead to higher present consumption and lower saving. Inevitably the net effect is uncertain from a theoretical standpoint. In this study to the extent that workplace schemes offer a higher implicit rate of interest than competing vehicles, there does seem to be some positive effect on net savings. Nevertheless, the role of subsidies is not to be exaggerated, as a very similar pattern was observed for personal superannuation, where schemes are 100% privately funded.

Alternatively, the employer contributions could be in lieu of cash payments so the total benefit package remains the same. In that case it is to be expected that other savings would fall from the lower disposable income to offset the rise in saving through the employer scheme. The end result is that even in the presence of employer contributions there could be total offset.

Another possible explanation for the finding that there is no substitution by those who hold workplace schemes (and in fact there is evidence of complementarity) is that those who joined a scheme did so as a result of financial education in the workplace (Bernheim and Garrett, 2003). Not only did this encourage them to participate in the work based scheme, but it also led to them increasing the savings they made in other vehicles above that which

they would have made in the absence of the workplace scheme. This is the “recognition” effect first identified by Cagan.

It is possible that complementarity arises from a desire to achieve a portfolio that offers the optimal balance between risk and return. Having invested in a workplace scheme, the participants chose to balance that investment with additional savings in vehicles which, while offering a different risk-return profile, have the effect of making the risk-return profile for the entire portfolio more in line with their preferences. The net effect is that total net worth is increased.

A further reason for the incomplete substitution, and in fact complementarity, is that some people might follow a hierarchical ordering in their saving patterns, first accumulating funds in a superannuation scheme and then subsequently saving in other forms (property, equities, etc).

Finally, we might expect to observe less than full substitution merely because the characteristics of pension schemes differ from those of other savings vehicles. Attanasio and Brugiavini (2003) identify a number of reasons why in fact pension wealth may not be a good substitute for financial saving in other forms. While their discussion relates to the pension wealth that individuals have in public schemes, their arguments apply in principle to holdings in workplace and personal superannuation schemes. They note that

“...future pension benefits are not liquid and cannot be borrowed against: individuals might be liquidity constrained at some points in time; the implicit rate of return on pensions is not the same as financial savings. In other words, financial and insurance market arrangements (including tax treatment of pension and financial instruments) and different welfare provisions may produce a variety of observed saving patterns and of substitutability results” (pp. 1075-1076).

The illiquidity of pension benefits is less of an issue in NZ where most schemes are either lump sum or allow pensions to be exchanged for a lump sum. However, they are still less flexible than other forms of saving as they are normally not accessible until resignation.

## 6 Conclusions

---

The HSS provides an opportunity to examine the retirement accumulations of those who report having superannuation schemes, either workplace or personal schemes. Workplace schemes are defined in the HSS as those involving an employer contribution. For those who had joined a workplace some time ago, it is possible that membership was compulsory. However that is no longer typically the case.

For both individuals and couples, it appears that those who belong to a workplace superannuation scheme have a considerably higher level of net worth. However, for personal schemes, the difference in net worth between holders and non-holders becomes statistically insignificant once such socio-economic variables as age, gender, education, region of residence, income, main source of income, and so on have been accounted for.

A formal test was made of the relationship between the value of holdings in a superannuation scheme and the value of net worth in other forms of saving. It is possible that where a person has chosen to participate in a workplace scheme, they would regard their saving in this scheme as a substitute for other forms of saving. In fact, in the limit, there could be perfect substitution, whereby for every additional dollar held in the

workplace scheme, one less dollar would be held in other vehicles. A less extreme case could involve partial substitution, and finally there might be complementarity. In this latter case, the individual would hold more in other vehicles as well as increased holdings in a workplace scheme.

In every case examined, for both workplace and personal schemes, we can reject the hypothesis of perfect substitution. In the only case where the results suggested partial substitution, the effect was typically small in absolute value and not statistically different from zero.

Finally for most cases we found significant complementarity. Regardless of gender and partnering status, individuals held more in other vehicles when they contributed to personal schemes. The corresponding effect is a little weaker, yet still significant, for workplace schemes. For both types of schemes, the effect was much stronger for partnered females than for partnered males and for unpartnered than for partnered individuals.

When these proportional changes are translated into dollar amounts, the results are impressive. An additional \$1 in a workplace scheme is associated with a higher total net wealth accumulation of \$1.74 for unpartnered females and \$2.10 for unpartnered males. For couples the effect is \$1.47. In the case of personal schemes the corresponding values are \$3.00 for unpartnered females, \$5.33 for unpartnered males and \$2.00 for couples.

In summary, there is evidence that those enrolled in workplace or personal schemes do have higher net worth than those not in such schemes. However, it must be stressed that the effects are not estimated with any great precision. They have wide margins associated with them, reflecting considerable variability in the underlying sample. In addition, we find no evidence of any substitution away from other forms of saving when an individual enrolls in a workplace or personal scheme. For both types of scheme, there is evidence that people in fact have higher wealth in other forms, indicating complementarity rather than substitution.

This study has been based on observed wealth accumulation at a single point in time. This does not allow us to trace the lifetime patterns of earnings, consumption and saving of particular age cohorts. It is possible for example, that decisions by older individuals about labour force participation and retirement might well be influenced by their wealth accumulation in superannuation schemes. If that were the case their lifetime earnings and savings might differ from those not in superannuation schemes.

It is possible that some people who were in a scheme in the past may have had the opportunity to withdraw either through resignation or moving to a fully cashed up remuneration package. Whether or not they reinvested the accumulations or spent them cannot be determined from the information contained in the HSS.

The principal caveat that should be borne in mind when interpreting the results of this study is that those who have voluntarily chosen to belong to a scheme might not necessarily have the same characteristics as the population as a whole. They could be drawn from a sub-population of those who have a greater propensity to save. It is true that the results have accounted for the influence of wide range of other factors (including age, ethnicity, migrant status, region, income and main source of income). It might be reasonably argued that these factors have controlled for at least some of the selection bias, so that the results do indicate a genuine influence on total net worth arising from the use of superannuation schemes. However the possibility that there are other unobserved

characteristics of people (such as their attitude to risk or their preference for consumption now rather than in the future) for which we have not accounted, cannot be ruled out.

If this were the explanation for why we observe those with superannuation schemes having higher net worth in total, then it is not clear that there any immediate policy implications to draw.

In contrast, if the fact of having joined a workplace scheme results in a “recognition” or “heightened awareness” of the need for saving, then arguably policies which promote voluntary enrolment in workplace schemes by providing information, reducing the costs of joining and removing any barriers might well foster increased retirement accumulation in total. The evidence does suggest this outcome is entirely possible.

## References

---

- Atanasio, Orazio P and Agar Brugiavini (2003) "Social security and household saving". *Quarterly Journal of Economics* 118(3): 1075-1119.
- Avery, Robert B., Gregory E Elliehausen and Thomas A Gustafson (1986) "Pensions and Social Security in household portfolios: Evidence from the 1983 Survey of Consumer Finances" in F Adams and S Wachter (eds) *Savings and Capital Formation*. (Lexington Books).
- Bernheim, Douglas B and Daniel M Garrett (2003) "The effects of financial education in the workplace: evidence from a survey of households." *Journal of Public Economics* 87(7-8):1487-1519.
- Blinder, Alan S, Roger Gordon and David A Wise (1981) "An empirical study of the effects of pensions on the saving and labour supply decisions of older men". Princeton, NJ: Mathtech Inc.
- Cagan, Phillip (1965) "The effect of pension plans on aggregate saving: evidence from a sample survey". Cambridge, MA, National Bureau of Economic Research, Occasional Paper No 95.
- Choi, James J, David Laibson and Brigitte C Madrian (2004) "Plan design and 401(k) savings outcomes." *National Tax Journal* (forthcoming).
- Diamond, Peter A and Jerry A Hausman (1984) "Individual retirement and savings behaviour". *Journal of Public Economics* 23:81-114.
- Drew, Michael E and Stanford, Jon D (2003) "A review Of Australia's compulsory superannuation scheme after a decade." Discussion Paper No 322, School of Economics, University of Queensland. <<http://reprint.uq.edu.au/archive/00000589/>>
- Gibson, John K and Grant M Scobie (2003) "Retirement wealth of New Zealand households: an initial analysis based on the household savings survey." Paper presented at a symposium on Retirement and Wealth, Office of the Retirement Commissioner, Wellington, New Zealand.
- Hubbard, R Glenn (1985) "Personal taxation, pension wealth and portfolio composition". *Review of Economics and Statistics* 67(1):53-60.
- Munnell, Alicia H (1976) "Private pensions and saving: New evidence". *Journal of Political Economy* 84(5):1013-1032.
- Periodic Review Group (2003) Retirement Income Report. Wellington.  
<<http://www.treasury.govt.nz/prg/>>
- Odean, Terrance and Brad Barber (2001) "Boys will be Boys: Gender, Overconfidence, and Common Stock Investment". *Quarterly Journal of Economics* 116(1):261-292.

OECD (1994) *Taxation and household saving*. (Paris: Organisation for Economic Co-Operation and Development).

Scobie, Grant M and Trinh Le (2004) "Saving for Retirement: New Evidence for New Zealand". Paper presented to the 5<sup>th</sup> SuperFunds Summit, Wellington, 6-7 April.

Statistics New Zealand (2002) *The Net Worth of New Zealanders: a Report on their Assets and Debts*. Statistics New Zealand, Wellington, New Zealand.

Sunstein, Cass R and Richard H Thaler (2003) "Libertarian paternalism is not an oxymoron". *University of Chicago Law Review* (forthcoming)  
<[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=405940](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=405940)>

Thaler, Richard H and Shlomo Benartzi (2001) "Save more tomorrow: Using behavioral economics to increase employee saving." Chicago, University of Chicago, Working paper. <<http://gsbwww.uchicago.edu/fac/richard.thaler/research/SMarT14.pdf>>

Venti, Steven F and David A Wise (1996) "The wealth of cohorts: retirement saving and the changing assets of older Americans." Cambridge, MA, National Bureau of Economic Research, Working Paper 5609, June.



## Appendix A: Descriptive Results from the Survey

This appendix presents the results derived from the survey. We examine the proportion of people enrolled in a workplace or personal scheme, the level of their holdings and compare these with those not enrolled in a scheme. We present results for unpartnered individuals and for couples.

### Enrolment in a superannuation scheme

#### Unpartnered Individuals

Of the total population of unpartnered individuals, 88.4% have neither type of superannuation scheme (see Appendix Table 1), while 0.6% have both; 3.7% have a workplace (WP) scheme and 7.3% of all those individuals have a personal scheme.

**Appendix Table 1- Unpartnered individuals who have either a workplace or personal superannuation scheme (Number and Percentage)**

Does the respondent have a Personal Super Scheme?					
		No		Yes	
Does the respondent have a WP Super Scheme?	No	823,014	88.4%	67,880	7.3%
	Yes	34,123	3.7%	5,942	0.6%

There are virtually no differences between unpartnered males and females in the rate of enrolment in either type of superannuation scheme (see Appendix Table 2).

**Appendix Table 2- Holdings and value of workplace or personal superannuation schemes by unpartnered individuals: by gender**

	Male	Female	All Individuals
Has a WP Scheme (%)	4.4	4.2	4.3
Has a Personal Scheme (%)	7.9	8	7.93
Has Both (%)	0.7	0.6	0.64
<i>Value of WP Scheme</i>			
Mean	78,336	31,065	52,387
Median	10,000	13,635	11,665
<i>Value of Personal Scheme</i>			
Mean	40,395	55,079	48,723
Median	6,500	16,844	12,000

## Couples

Turning to couples, in 31.4% of the cases at least one partner reported having a superannuation scheme; 12.4% have a workplace scheme, 15.4% have a personal scheme and 3.6% have both. The remaining 68.6% of couples have no superannuation scheme (see Appendix Table 3).<sup>12</sup>

**Appendix Table 3 - Couples who have either a workplace or personal superannuation scheme (Number and Percentage)**

		Does either partner have a Personal Super Scheme?			
		No		Yes	
Does either partner have a WP Super Scheme?	No	587,208	68.6%	131,853	15.4%
	Yes	105,675	12.4%	31,124	3.6%

## Value of holdings in superannuation schemes

### Unpartnered Individuals

Overall, the mean value of the holdings in workplace schemes by unpartnered individuals is \$52,400 and in personal schemes is \$48,700 (Appendix Table 2). Clearly these distributions are highly skewed with a few individuals having very large holdings, as the median holdings are respectively \$11,700 and \$12,000.

Notably, the median holding by females is much higher than that for males for both types of schemes. The median level of personal superannuation by females is greater than their median level in workplace schemes. Overall the results suggest that women make greater use of personal rather than employer-based schemes. To the extent that women have more broken employment histories they may well enrol in a personal scheme which typically has more portability than a workplace scheme.

Another explanation for the higher median holdings by females may lie in fundamental gender differences. Odean and Barber (2001) argue that males tend to be overconfident about their own ability to invest. In this case, we might then expect males to hold a more aggressive portfolio than putting aside funds in a superannuation scheme. And even where males do hold schemes they manage them in such a way as to result in lower returns and hence have lower median holdings in the long run.

Among unpartnered females with employer-based schemes, 24% have holdings less than \$5,000 and 55% have holdings between \$10,000 and \$50,000. Only 4% of females have holdings over \$100,000 compared with 18% of males. These results are consistent with a higher median but lower mean for females.

<sup>12</sup> The enrolment rates in New Zealand compared to other countries may well be influenced by taxation policy. In New Zealand, contributions to schemes are made from after-tax income, the earnings are taxed and the withdrawals exempt. For a comparison of taxation regimes for savings see OECD. It is possible that there is a relationship between length of employment with current employer and the presence of a workplace scheme. In other words, if those who have a workplace scheme have a reasonable period of service, the fact that they belong may be an indication of having been employed when memberships were open, rather than necessarily reflecting greater concern for preparation for retirement. Unfortunately the HSS does not give length of service with current employment.

Almost one half of females enrolled in a personal scheme have holdings in excess of \$20,000, in contrast to males where only 35% of those with a personal scheme have holdings at this level, again reinforcing the result that women appear to make greater use of personal schemes.

For unpartnered individuals not holding an employer-based scheme, the median total net worth is \$6,000 for males and \$11,900 for females. In comparison those holding such schemes (many of whom will be older workers) have median net worth of \$60,000 and \$63,100 of net worth respectively (Appendix Table 4).

**Appendix Table 4 - Median Values of net worth and workplace superannuation for unpartnered individuals by quintiles of net worth**

Quintile of Net Wealth	Median Net Worth for those with no WP Scheme		For those having a Workplace Scheme:			
	Males	Females	Median Net Worth		Median Value of WP Scheme	
			Males	Females	Males	Females
1	-8,580	-8,415	-15,140	-12,079	7,000	720
2	300	305	2,831	No observations	3,025	No observations
3	10,451	9,510	10,399	11,143	680	6,506
4	62,966	89,309	49,783	77,150	10,598	20,000
5	305,151	278,200	358,430	303,950	135,587	28,000
Total	6,000	11,920	60,000	63,100	10,000	13,635

The value of the scheme rises sharply with the level of net worth especially for males. Overall, the average contribution of employer based schemes to total net worth among those holding schemes is over one third (see Appendix Table 5).

**Appendix Table 5 - Mean values of net worth and value of workplace superannuation scheme for unpartnered individuals by quintiles of net worth**

Quintile Net Worth	Mean NW of those with no WP Scheme	For those having a WP Scheme		
		Mean Net Worth	Mean Value of WP Scheme	Mean Ratio WP:Total NW
1	-13,732	-85,285	3,927	-0.33
2	668	1,474	1,532	0.96
3	11,366	13,571	6,001	0.55
4	81,151	79,842	19,987	0.29
5	391,144	496,786	102,446	0.27
Total	86,490	215,989	48,723	0.35

## Couples

The median net worth of couples with a workplace scheme is over \$100,000 more than couples without a scheme. The median ratio of holdings to total net worth by couples with at least one partner enrolled is 17% (see Appendix Table 6). The workplace scheme represents a greater share of retirement wealth amongst the lower wealth quintiles. Amongst the richest net worth quintile those with a workplace scheme have lower median net worth than those without such a scheme. The high net worth quintile has a disproportionate share of self employed individuals who by definition would not have a current employer making a contribution.

**Appendix Table 6 - Median values of net worth and workplace superannuation for couples by quintiles of net worth**

Net Worth Quintile	Median Net Worth for those Couples with no WP Scheme	For those having a Workplace Scheme:		
		Median Net Worth	Median Value of WP Scheme	Median Ratio WP: Total Net Worth
1	1,000	11,300	5,000	0.66
2	67,700	73,828	13,746	0.17
3	168,700	182,097	23,356	0.16
4	332,262	346,094	57,000	0.17
5	774,699	703,244	119,406	0.17
Total	152,010	269,180	40,278	0.17

There is some tendency for the proportion of couples enrolled in a workplace scheme to increase with age up til 45-55, but the overall trend is not striking (Appendix Table 7). The same is true for unpartnered individuals. It might have been expected that older cohorts who had entered the workforce at time when workplace superannuation schemes were more prevalent would have shown a greater enrolment rate than younger cohorts. It is possible that they did in fact join in greater numbers (perhaps because in some cases membership was compulsory) and have subsequently cashed in their schemes. Alternatively it might be the case that the younger age groups are in fact enrolling at rate similar to that which people have always enrolled, at least in the case of personal schemes.

As would be expected, the value of the holdings increases markedly with age and for older couples workplace superannuation reflects an important share of their total net worth. Furthermore, the share of total retirement wealth that is represented by workplace schemes tends to be higher when approaching retirement for both males and females in couples. In three out of the four age groups unpartnered women have higher median holdings in workplace schemes than men.

While only 15% of all partnered males nearing retirement (ages 56-64) are enrolled, among those who are enrolled the median ratio of holdings to total net worth is one half. In other words, for almost 1 in 6 pre-retirement partnered males, workplace superannuation represents an important share of their total retirement wealth accumulation.

**Appendix Table 7 - Holdings of workplace schemes: by age and gender**

Age Group		Partnered			Unpartnered		
		Male	Female	Total	Male	Female	Total
25-34	Proportion Enrolled (%)	13.1	6.7	9.6	5.6	5.8	5.7
	Median Value of WP Scheme	10,157	13,435	10,726	3,023	11,665	6,506
	Median ratio of Value of WP in Net Worth excl. Value of WP	0.16	0.27	0.22	0.07	0.34	0.07
35-44	Proportion Enrolled (%)	13.3	5.8	9.4	9.6	7.9	8.6
	Median Value of WP Scheme	50,309	10,426	26,235	25,000	15,000	15,000
	Median ratio of Value of WP in Net Worth excl. Value of WP	0.49	0.08	0.31	0.64	0.22	0.33
45-55	Proportion Enrolled (%)	16.6	6.1	11.6	10.7	5.8	7.8
	Median Value of WP Scheme	53,520	40,000	45,000	30,000	44,288	32,380
	Median ratio of Value of WP in Net Worth excl. Value of WP	0.42	0.18	0.28	0.15	0.28	0.19
56-64	Proportion Enrolled (%)	14.6	5.0	9.8	4.8	8.9	7.5
	Median Value of WP Scheme	150,000	60,000	124,689	10,272	25,000	20,000
	Median ratio of Value of WP in Net Worth excl. Value of WP	0.55	0.36	0.53	0.03	0.18	0.18

Of couples in which at least one partner holds a workplace scheme, over 40% have in excess of \$50,000 value in the scheme. Over 60% of couples holding a personal scheme have more than \$20,000.

A summary across all individuals and couples is given in Appendix Table 8. For both males and females, those holding either type of superannuation scheme have typically twice the net worth of the population as a whole. Unpartnered females have greater accumulations in both types of scheme and greater total net worth than their male counterparts.

**Appendix Table 8 - Median values of net worth and superannuation schemes**

	For those who hold a workplace scheme		For those who hold a personal scheme		For total population
	Total NW	WP Scheme	Total NW	Personal Scheme	Total NW
<i>Females</i>					
Unpartnered	63,100	13,635	109,200	16,884	13,100
Partnered	134,297	19,591	129,575	12,984	79,009
All	106,866	15,198	122,730	14,174	60,690
<i>Males</i>					
Unpartnered	60,000	10,000	51,500	6,500	7,772
Partnered	171,810	46,782	143,300	20,000	88,000
All	156,262	43,482	130,805	19,000	57,300
Couples	269,180	40,278	249,814	20,000	172,210

In summary, both individuals and couples who have a workplace scheme appear to have much higher median levels of net worth. The exception is those couples in the highest wealth quintile. This suggests that belonging to a scheme does result in greater overall retirement accumulation. It may be however that those enrolled have higher incomes, are more educated, or display some other particular characteristics. A valid comparison requires that we hold constant at least some of these differences across individuals. We conduct such a comparison in the Section 3.

## Appendix B: Full Regression Results

**Appendix Table 9 – Regression results – testing whether a super scheme is a substitute or a complement to other forms of retirement saving for individuals**

	Value of Workplace Super scheme		Value of Personal Super scheme	
	Coefficient	t-value	Coefficient	t-value
Log super scheme	0.25	4.74***	0.32	6.51***
Male*Log super scheme	-0.14	-2.48**	-0.06	-1.23
Partnered*Log super scheme	-0.12	-2.19**	-0.16	-3.08***
Has another Super scheme	0.51	3.68***	0.55	4.00***
<i>Personal characteristics</i>				
Male	1.37	2.51**	0.45	0.95
Partnered	1.53	2.99***	1.72	3.50***
Age	0.64	3.88***	0.45	3.48***
Age squared	-0.01	-3.02***	-0.01	-2.94***
Age cubed	7.56E-05	2.53**	5.68E-05	2.66***
Pakeha	0.04	0.38	0.14	1.30
Migrant	-0.37	-3.29***	-0.12	-1.16
<i>Residence</i>				
Rural	0.32	1.82*	0.04	0.38
Metropolitan region	0.19	2.06**	-0.11	-1.48
<i>Education</i>				
Years of education	0.00	0.00	0.03	2.09**
<i>Inheritances</i>				
Inherited >\$10,000	0.25	1.80*	0.11	0.89
Inheritance amount	1.66E-06	1.62	4.31E-06	4.98***
Expecting inheritances	0.30	3.25***	0.24	2.90***
<i>Income</i>				
Main source=Self-employment	0.51	2.43**	0.60	6.06***
Main source= "Other" #	0.30	0.58	-0.39	-2.28**
Total income	2.83E-05	6.22***	1.43E-05	5.99***
Income squared	-8.94E-11	-3.76***	-2.03E-11	-2.89***
Constant	-4.37	-1.93*	-0.91	-0.46
Sample size	553		835	
Adjusted R-squared	0.52		0.40	
F-statistic for overall model	F(21, 531) = 29.51***		F(21, 813) = 27.09***	

Note: The dependent variable is log net worth excluding the value of the super scheme on the RHS. The t-statistics are based on the test of the hypothesis that the coefficient is different from zero. \*Significant at the 10% level. \*\*Significant at the 5% level. \*\*\*Significant at the 1% level. #The reference category is that group whose main source of income is wages and salaries.

**Appendix Table 10 – Regression results – testing whether a super scheme is a substitute or a complement to other forms of retirement saving for couples**

	Value of Workplace Super scheme		Value of Personal Super scheme	
	Coefficient	t-value	Coefficient	t-value
Log super scheme	0.09	2.70***	0.11	3.43***
<i>Couple's characteristics</i>				
Respondent's age	0.31	1.38	0.47	2.29**
Respondent's age squared	-0.01	-1.10	-0.01	-2.06**
Respondent's age cubed	3.68E-05	0.94	6.66E-05	1.90*
Partner's age	0.02	1.71*	0.02	1.99**
Married couple	0.17	1.15	0.22	1.77*
Both partners are Pakeha	0.16	1.17	0.26	2.30**
Either partner is migrant	-0.30	-2.33**	-0.11	-0.97
<i>Residence</i>				
Rural	0.40	1.83*	0.11	0.84
Metropolitan region	0.29	2.56**	-0.19	-2.09**
<i>Education</i>				
Respondent's years of education	-0.02	-1.00	0.03	1.84*
Partner's years of education	0.01	0.47	0.02	1.31
<i>Inheritances</i>				
Inherited >\$10,000	0.17	1.20	0.21	1.85*
Inheritance amount	9.10E-07	1.10	2.50E-06	3.26***
Expecting inheritances	0.52	4.43***	0.10	1.06
<i>Income</i>				
Main source=Self-employment	0.39	1.68*	0.40	3.55***
Main source= "Other" #	0.85	0.97	-0.52	-1.97**
Total income	1.57E-05	5.56***	1.08E-05	4.88***
Income squared	-2.56E-11	-3.72***	-1.71E-11	-2.82***
Constant	2.74	0.89	1.16	0.40
Sample size	422		552	
Adjusted R-squared	0.42		0.32	
F-statistic for overall model	F(19, 402) = 17.10***		F(19, 532) = 14.55***	

Note: The dependent variable is log net worth excluding the value of the super scheme on the RHS. The t-statistics are based on the test of the hypothesis that the coefficient is different from zero. \*Significant at the 10% level. \*\*Significant at the 5% level. \*\*\*Significant at the 1% level. #The reference category is that group whose main source of income is wages and salaries.