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Portfolio Allocation in the Face of a Means-Tested Public Pension

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SEDAP Research Paper No. 260

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Kenneth Taylor Hall, Room 426
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e-mail: sedap@mcmaster.ca

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Portfolio Allocation in the Face of a Means-Tested Public Pension *

Deborah A. Cobb-Clark†
Economics Program ResearchSchool of Social Sciences
Australian National University
and Institute for the Study of Labor (IZA), Bonn

Vincent Hildebrand‡
Glendon College, York University, Canada
and CEPS/INSTEAD, Luxembourg

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Abstract

Is there evidence that households adjust their asset portfolios just prior to retirement in response to a means-tested public pension? We address this question by estimating a system of asset equations constrained to add up to net worth. We find little evidence that in 2006 healthy households or couples responded to the incentives embedded in the means test determining pension eligibility by reallocating their assets. While there are some significant differences in asset portfolios associated with being near the income threshold, being of pensionable age, and being in poor health these differences are often only marginally significant, are not robust across time, and are not clearly consistent with the incentives inherent in the pension eligibility rules. In 2006, any behavioral response to the means test seems to occur among single pensioners in poor health. Comparison with 2002 results suggests the incentives to reallocate assets may have weakened over time.

Keywords: asset portfolios; means testing; public pension; household wealth
JEL classification codes: H30; H31; D31

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†Deborah Cobb-Clark, Economics Program, RSSS, ANU, Canberra Australia 0200. E-mail: deborah.cobb-clark@anu.edu.au. Phone: (61)-2-6125-3267. Fax: (61)-2-6125-0182.

‡Corresponding Author: Vincent Hildebrand, Department of Economics, York Hall 363, Glendon College, York University, 2275 Bayview ave., Toronto, Ontario, M4N 3M6 Canada. E-mail: vincent@econ.yorku.ca.

Résumé

Pouvons-nous montrer que les ménages ajustent leurs portefeuilles d'actifs juste avant leur départ à la retraite en réponse aux conditions de ressources donnant droit à une pension gouvernementale? Nous examinons cette question par l'estimation d'un système d'équations d'actifs dont la somme est contrainte par la valeur nette du patrimoine des ménages. Nous trouvons peu d'éléments suggérant qu'en 2006 les ménages ou les couples en bonne santé aient répondus aux incitants inhérents à l'examen des ressources donnant droit à une pension publique en modifiant leurs choix de portefeuille. Bien qu'il existe des différences importantes entre les portefeuilles d'actifs liés au fait d'être près du seuil de revenu éligible, de l'âge de la retraite, et d'être en mauvaise santé, ces différences ne sont souvent que marginalement significatives, ne sont pas robustes dans le temps, et ne sont pas clairement compatibles avec les incitants inhérents aux règles d'éligibilité donnant droit à une pension publique. En 2006, aucune réponse comportementale aux conditions de ressources ne semble se produire chez les retraités célibataires en mauvaise santé. Une comparaison avec les résultats de 2002 indique que les incitants à réaffecter les actifs ont pu s'affaiblir au fil du temps.

1 Introduction

Countries around the world are struggling with the challenges associated with providing old-age support to an ever increasing share of their populations. The dramatic expansion in the fraction of those over the age of 65 – in the face of a constant, or in some cases even declining, workforce-age population (see Gruber, 2001; Visco, 2002) – has raised serious concerns about pay-as-you-go funding mechanisms. Many countries have responded by moving to reduce their public-pension liabilities through increases in the retirement age, enhanced means testing of public pensions, and incentives for private savings (OECD, 2007). Means testing can reduce overall pension costs by targeting limited government resources towards those elderly in the greatest need (Knox, 1995) and younger cohorts of workers appear to have reacted to the general trend in the downsizing of public pensions by increasing their voluntary savings for old age (see Börsch-Supan, 1996; Börsch-Supan and Reil-Held, 1998). At the same time, means testing results in higher effective marginal tax rates that can lead to disincentives to save before or to accept employment after retirement age (Knox, 1995). Understanding the substitution effects between the alternative pillars of retirement income is crucial for understanding the consequences of government pension reforms at both the micro and macro level (Börsch-Supan and Reil-Held, 1998).

The objective of this paper is to shed light on this issue by assessing whether there is any evidence that households adjust their asset portfolios just prior to retirement in order to maximize their eligibility for a means-tested public pension. To this end, we take advantage of recently-available, detailed micro data for a nationally-representative sample of Australian households. Unlike previous researchers, we allow asset composition to depend on net worth and estimate a system of asset equations with cross-equation restrictions imposed to ensure that the adding-up requirement is met (see Blau and Graham, 1990). Australia provides an interesting case for studying these issues because it has had a universal – but targeted – age pension financed from general revenues for a century. The introduction of a mandatory, employer-based pension system in 1992 implies that Australian retirement income policy now approximates the three pillar approach common in developed countries (Bateman and Ablett, 2000).[1] Despite this, the Australian age pension remains the central mechanism for ensuring adequate retirement incomes with approximately 75 percent of Australians aged 65 and older in receipt of the age pension in 2008.[2]

Against this institutional backdrop, we are particularly interested in the following questions. How do the portfolio choices of pre- and post-retirement period households differ? Second, are these differences consistent with households managing their wealth in a way that maximizes ac-

[1] The three pillars of retirement income are generally considered to be: 1) public pensions and social security; 2) employer pension plans; and 3) private retirement income. Some researchers also refer to a fourth pillar which encompases intergenerational transfers (see, for example, Börsch-Supan and Reil-Held, 1998).

[2] Authors' calculation based on the number of Age Pensions and the total population aged 65 plus (Australian Bureau of Statistics, 2008; Harmer, 2009).

cess to the Australian age pension? These questions are important in shedding light on the capacity of public policy to – either intentionally or unintentionally – affect the way that households save for old age. The life cycle hypothesis provides the foundation for much of the economic theory surrounding the level and timing of (dis)savings and consumption in old age,[3] but is often less useful in understanding how households structure their wealth portfolios. The riskiness of a households' retirement income, however, is ultimately driven by the structure of its asset portfolio.[4] The manner in which public pensions are means tested is likely to affect not only the incentive to save generally, but also the incentive to structure wealth portfolios in particular ways. Moreover, gender differences in longevity mean that these issues are particularly salient for elderly women who are often much more dependent on public pensions (Preston and Austen, 2001; Jefferson and Preston, 2005).

We find little evidence that in 2006 healthy households or couples are responding to the incentives embedded in the asset and income tests used to determine Australian age pension eligibility by reallocating their assets. While there are some significant differences in asset portfolios associated with having an income near the income threshold, being of pensionable age, and being in poor health these differences are often only marginally significant, are not robust across time, and are not clearly consistent with the incentives inherent in the Australian age pension eligibility rules. Any behavioral response to the incentives inherent in the age-pension means test in 2006 appears to be predominately concentrated among single pensioners who are in poor health. In 2002 there is also evidence that healthy households above pension age held significantly more wealth in their homes than did otherwise similar younger households perhaps suggesting some reduction in the incentives to reallocate assets over time.

In the next section, we briefly present some important features of the institutional context, in particular the means tests, underlying the Australian age pension which are pertinent to our research questions. We then discuss the details of the data and present descriptive statistics for our estimation sample. The empirical strategy and regression results are presented and discussed in Section 4. Our conclusions and suggestions for future research are outlined in Section 5.

2 The Australian Age Pension

The Australian age pension was introduced in 1909 in an effort to alleviate poverty amongst older Australians. From its inception, receipt of the age pension has always been subject to means tests that, until the 1980s, were frequently changed, usually in the direction of expanded access to the age pension (see Knox, 1995). The Australian government moved in the 1980s, however,

[3] See (Blau, 2008) for a recent example.

[4] See Börsch-Supan and Reil-Held (1998) who discuss the risk in terms of both variation in and inadequacy of retirement income.

to increase targeting of the age pension by tightening the means test and introducing an asset test. Minimum compulsory employer pension contributions were also introduced in 1992 in an effort to extend private pension coverage to a broad group of labor market participants (Atkinson, Creedy, and Knox, 1999; Bateman and Ablett, 2000; Preston and Austen, 2001). This – along with tax incentives to encourage private savings – are expected to reduce future cohorts' reliance on the age pension (Preston and Austen, 2001). Until then, however, the age pension remains the primary mechanism for delivering retirement income to more than two million Australians over the age of 65 (Harmer, 2009).

Eligibility for the age pension is contingent on a residency requirement and age restriction.[5] Men become eligible at age 65, while women's eligibility is in the process of being gradually increased from age 60 in 1995 to age 65 by 2014.[6] Benefits are determined by tests of both income and assets – whichever results in the lowest payment – making the arbitrage between the optimal levels of income and assets very complex. Age pensioners also receive subsidies for health care, pharmaceuticals, public transport, utilities and rent assistance. As a result, there is an incentive at the margin to qualify for a small pension in order to take advantage of the various additional, lump-sum benefits derived from these subsidies.

Many researchers have argued that the specifics of these income and asset tests generate incentives for households to structure their retirement assets in particular ways (see Atkinson, Creedy, and Knox, 1995; Barrett and Tseng, 2008; Cho and Sane, 2009). The 2006 income test, for example, resulted in a reduction in pension benefit payments of between $0.40 (couples) and $0.20 (singles) for each dollar of income received, derived, or earned in excess of an income disregard each fortnight. In particular, financial investments are assumed (or "deemed") to have earned a specific, fixed rate of interest regardless of the return that they are actually providing.[7] This particular aspect of the income test may give households an incentive to reallocate their financial wealth towards riskier financial assets that are expected to yield returns exceeding the deemed rate set by government rather than safer financial assets that yield returns lower than the deemed rate. Thus, we expect that the way in which households hold their financial wealth may be affected by the deeming rules. It is less clear how the deeming rules might affect the incentives to hold financial wealth in general.

Home ownership status is central to the asset test as different tests are applied to homeowners and non-homeowners. At the same time, an individual's principal place of residence is exempt from the asset test making the asset test a function of homeowner status, but independent of the

[5] See Cobb-Clark and Hildebrand (2008) for details.

[6] At the time our data were collected, women were eligible for the age pension at age 63.

[7] In particular, in 2006 the first $38,400 of financial investments for a single person or the first $63,800 of financial investments for a couple were deemed to have earned a return of 3 percent. Any remaining financial investments were deemed to have earned 5 percent (FaHCSIA, 2009). Note that HILDA included two wealth modules in 2002 and 2006 making the age pension rules in place during these years the most relevant for this study.

value of the principal residence. More precisely, in 2006, single homeowners with assets up to $161,500 could receive full pensions, while single non-homeowners experienced a reduction in their pension rate only after their assets had reached $278,500. The asset threshold for coupled homeowners (non-homeowners) was $229,000 ($346,000).[8]

Cho and Sane (2009) argue that the favorable treatment of housing in the age-pension means test leads to higher than average home ownership rates in Australia generally. One might also expect households to rebalance their portfolios in such a way as to allocate more wealth towards their principal residence and less wealth towards other assets upon reaching pension age. In particular, households may have an incentive to increase home equity and decrease equity in risky (often liquid) assets with high yields. This would reduce the value of assets subject to the asset test and would decrease the deemed income associated with financial wealth which factors into the income test thus increasing the probability that a household qualifies for the age pension under both tests. More generally, households attempting to qualify for the age pension under the income test may have an incentive to shift investments towards either less risky, non-financial assets with very low returns or towards life-style assets (e.g. cars, recreational vehicles, holiday homes) that do not generate additional income.

Most importantly, many Australian retirees have the ability to take their employer-provided pensions as lump sums, rather than as income steams, which exacerbates the influence of means testing the age pension (Atkinson, Creedy, and Knox, 1995). In particular, there are concerns that the means test creates incentives for older Australians to reduce their wealth at retirement by simply purchasing expensive consumer goods – for example, by cashing out pensions to finance expensive holidays – and then relying on the age pension. Atkinson, Creedy, and Knox (1999) investigate the complex set of decisions which constitute the 'retirement maze' and conclude that Australian households rarely face an obvious strategy for negotiating it. Despite this, their numerical analysis demonstrates that the age-pension means test generates strong incentives for restructuring wealth and consumption at retirement. Cho and Sane (2009), investigate this issue empirically, however, and find little evidence that Australian households draw down their financial wealth in order to qualify for the age pension. On the other hand, Barrett and Tseng (2008) argue that the fact that Australian households above the pension-eligibility age continue to hold large assets rather than converting them to an income stream may itself be evidence that the means test underlying the age pension is affecting behavior.

Given this institutional context it seems reasonable to expect that the targeting of age pension benefits affects the incentives to accumulate wealth generally as well as to allocate wealth towards some and away from other assets. Consequently, in what follows we analyze the link between

[8] Assets exceeding these exemption amounts reduced pension rates by $3 per fortnight for every $1000. Major changes to the asset test rules have been introduced in September 2007. In particular, the level of pension benefits are now reduced by $1.50 per fortnight for every $1000 assets above the disregard level (see FaHCSIA, 2009, for further details).

means testing of the age pension and household wealth by focusing directly on the allocation of wealth across asset types.

3 The HILDA Survey

The data come from the Household Income and Labour Dynamics in Australia (HILDA) Survey which is a longitudinal survey of Australian households encompassing approximately 13,000 individual respondents living in more than 7,000 households. Our analysis relies on the 2002 and 2006 releases of HILDA (waves 2 and 6) which provide the only micro-level, longitudinal data on household wealth holding in Australia (see Wooden, Freidin, and Watson, 2002; Heady, Marks, and Wooden, 2005; Watson, 2009).

We have necessarily made a number of sample restrictions. Because household wealth can be difficult to measure and conceptualize in households with multiple families, we have dropped a small number of multi-family households, all group households, and all related family households. We have dropped all single- or couple-headed households in which the respondent (or his or her partner) did not provide an interview. Finally, in order to maintain a sufficiently large sample of households around retirement age, we restrict our sample to all households in which the reference person is between 55 years and 74 years old. These restrictions result in a primary analysis sample of 867 couple-headed households and 602 single-headed households in 2006. We also conduct a range of sensitivity analyses using data from 927 couple-headed households and 582 single-headed households in 2002.[9]

Most of HILDA's wealth components are collected at the household level.[10] In this paper, we consider the way in which wealth is distributed across five broad asset types. We have defined these five asset types so as to capture the possible incentives to reallocate assets that are embedded in the pre-2007 asset/income test rules for qualifying for the Australian age pension. Specifically, we focus on the following: net financial wealth, net business equity, net equity in own home, life-style assets, and the total value of pension assets. Net financial wealth is calculated as the total value of interest-bearing assets held in banks and other institutions, stocks and mutual funds, life insurance funds, trust funds and collectibles minus the total value of unsecured debts (which also include car loans). The net value (equity) of own home captures households' equity in their principal residence. Net business equity includes the net value of all business shares owned by all household members. Life-style assets include all non-liquid assets which do not necessarily generate a steady income stream including all transport and recreational vehicles (such as boats or caravans) and all other real estates (such as holiday homes and other properties) owned by

[9] Couple-headed households include both married and cohabiting couples.

[10] See Heady (2003) for a detailed discussion of wealth measurement in HILDA.

household members.[11] The pension component of net worth includes the total amount of pension capital owned by all household members.

HILDA does not use the concept of a reference person (or household head). Consequently, in couple-headed households, we define the head of household to be the oldest partner. We then separately account for the age of household heads and their spouses in the estimation model. Moreover, our analysis considers single- and couple-headed households separately as these two groups face different incentives given the asset- and income-test rules in place.

3.1 The Retirement Status of Older Australians

Our objective is to shed light on whether there is evidence that the incentives embedded in the asset and income tests used to determine eligibility for the age pension lead older Australian households to revise their portfolio allocation. Consequently, in our analysis we explicitly consider two subpopulations. The first includes all households in which the reference person (or household head) is between 55 and 64 years of age. Given that the reference person is defined as the oldest partner in a couple, very few household members in this age group are entitled to claim the age pension (about 3 percent of all couple-headed households in 2006). The second subpopulation includes all households in which the reference person is between 65 and 74 years old. This implies that in this age group at least one household member has reached the age necessary to receive age pension benefits.

We begin by considering the retirement status of individuals in these two groups of households. Information on relevant demographic characteristics and place of residence for individuals in our estimation sample is reported in Table 1 for couple-headed households and in Table 2 for single individuals. In each table, the first four columns report weighted sample means (and standard deviations) from wave 2 of HILDA, while the last four columns report weighted sample means (and standard deviations) using HILDA data from wave 6.

[Tables 1 and 2 HERE]

It is interesting to note that while most household members in younger households (i.e. those in which the head is aged 55-64) are not eligible to claim age pension benefits, in about 17 percent (22 percent) of couples both partners nonetheless reported being retired in 2006 (2002). In contrast, approximately 40 percent of single-headed households in this younger age group had already left the labor force over the same time period. Not surprisingly, the proportion of retirees

[11] We consider the total value of all vehicles, not vehicle equity because the amount of any car loans is combined with other debts (such as other loans, hire purchase or overdraft) in the HILDA survey making it impossible to derive a measure of vehicle equity.

rises substantially after the age of 64. For instance, in 2006 (2002), at least 80 (83) percent of all couple-headed households in this age range reported at least one household member being retired while up to 87 (88) percent of single individuals between 65 and 74 years old were no longer in the labor force in 2006 (2002).

3.2 Health Status and Wealth

Age pensioners are eligible to receive subsidies for health care or pharmaceuticals. As a result, the incentives to qualify for the age pension might also be affected by the health status of future claimants. Individuals in poor health may have greater incentives to reallocate their assets in order to qualify for the age pension. We examine the impact of health using a measure of self-assessed (non-fatal) health commonly used in the literature. Specifically, HILDA respondents are asked to rate their health on a five point scale labeled: 'excellent', 'very good', 'good', 'fair' and 'poor'. We use this information to create an indicator variable for poor health which is equal to one whenever a respondent rates his or her health as either 'fair' or 'poor' and zero otherwise.

Tables 1 and 2 reveal that the incidence of poor health does not differ substantially across household types with about 30 percent of reference persons reporting being in poor health. Surprisingly, being older is also not associated with significant differences in self-reported health status. For instance, approximately 27 (30) percent of married heads of household aged 55-64 report being in poor health in comparison to 33 (27) percent of married household heads in the 65-74 age group in 2006 (2002) respectively. These differences in self-reported health status across age groups are not statistically significant.[12]

Tables 3 and 4 present information about the relationship between net worth, asset portfolios and self-reported health status. Being in good health is associated with a higher incidence of owning each asset type as well as with holding more wealth in all asset types.[13] For instance, couple-headed households in which both partners report being in good heath hold over $300,000 more wealth at the median (and the mean) than couple-headed households in which at least one spouse reports being in poor health. These results are in line with findings from US studies that demonstrate the close link between health and wealth (Smith, 1999; Hurd and Kapteyn, 2003; Michaud and van Soest, 2008). Given these differences in the level of net worth – and the potential incentives inherent in the age pension eligibility rules – it is sensible to expect that health status may affect the portfolio choices of older households.

[Tables 3 and 4 HERE]

[12] Test results are not reported but are available upon request.

[13] These differences across health status are both economically meaningful and statistically significant.

3.3 Age and Wealth

Descriptive statistics on household net worth, asset portfolios, and income are also presented for couple-headed (Table 5) and single-headed (Table 6) households separately by age groups. These results indicate that the median net worth of all Australian households grew substantially between 2002 and 2006. For example, couple-headed (single-headed) households aged 55-64 in 2006 had a median wealth of about $137,000 (about $115,000) more than the same age group in 2002.[14] Similar increases in median net worth occurred among older households over this period. This widespread increase in wealth levels is not surprising given the exceptional boom in both the equity and the real-estate markets which took place in these years.

[Tables 5 and 6 HERE]

The composition of wealth also appears to have changed over time. Despite their higher wealth levels, couple-headed households aged 55-64 in 2006 held less financial wealth than their counterparts did in 2002 ($120,593 vs $161,339). At the same time, there has been a dramatic increase in pension wealth which is consistent with the continuing expansion of the employer-pension system. For example, couple-headed (single-headed) households aged 55-64 in 2006 held approximately $67,000 ($34,000) more wealth in their pensions than the same age group did in 2002. Similar growth over time is observed in the pension wealth of older Australian households. Over time, younger households also appear to be holding more wealth in their homes. For example, couple-headed households aged 55-64 in 2006 held $75,000 more wealth in house equity than did their counterparts in 2002. These patterns suggest that over time Australian households reallocated wealth from the financial market to their pensions and houses.

4 Regression Results

The descriptive results discussed above are useful in highlighting the broad differences in asset portfolios across household type, age, health status, and time. At the same time, it is often difficult to interpret these differences because the level of household wealth also varies with these same characteristics. Consequently, we are often left comparing households that are not equally wealthy. This is problematic because the nature of credit markets and financial institutions implies that there is a link between total wealth and asset portfolios. We would like to know whether changes in portfolios as households age can be attributed to the incentives inherent in the age pension eligibility rules or are merely the result of households spending down their wealth to finance consumption in retirement.

[14] These differences are statistically significant. All 2002 figures are expressed in 2006 dollars. We use the ABS CPI quarterly number for September as deflator.

To gain a deeper understanding of these issues, we require a model which will allow us to estimate the effect of means testing households' access to a public pension (the Australian age pension) on households' portfolios. In other words, we need an estimation strategy that first, recognizes that the propensity to invest in a specific asset will depend on the types (and amounts) of other assets held; second, compares households with the same level of net worth; and third, allows us to control for other confounding factors like poor health. Therefore, we need to estimate a system of regression equations with an adding up constraint imposed to account for total net worth (see Blau and Graham, 1990). Consequently, we estimate the following reduced-form model of asset composition:

$$\sinh^{-1}(A_{ik}) = a_{0k} + Y_i b_{1k} + X_i b_{2k} + A_i b_{3k} + W_i b_{4k} + \mu_{ik} \tag{1}$$

where A_{ik} is the dollar value of asset k that household i holds. We consider our five major asset categories: financial wealth, business equity, equity in own home, life-style assets, and pension funds. The vector Y_i includes both total family gross income and a dummy variable capturing whether household income is within the range of being able to collect the age pension.[15] Moreover, X_i is a vector which includes a measure of poor health as well as other demographic characteristics reflecting a household's life-cycle stage. In the case of single-headed households, we also control for whether individuals are divorced or never married (with widowed constituting our reference group). We allow households' asset portfolios to depend on net worth (W_i) in order to account for any capital market imperfections (such as credit constraints) which might vary across households and be related to the decision to hold a particular asset. Finally, A_i is a vector (quadratic in age, indicator for pension age) which accounts for both the effects of aging generally and any specific effects associated with reaching pension eligibility age.

We adopt an inverse hyperbolic sine transformation ($\sinh^{-1}$) of assets and income to account for the potentially nonpositive and highly skewed nature of the distributions of these variables (see Cobb-Clark and Hildebrand, 2006, for further discussion). Finally, equation (1) is estimated as a system of equations and a set of cross-equation restrictions are imposed in order to satisfy the adding-up requirement that the sum of assets across asset types equals net worth.[16]

We consider two model specifications: 1) our baseline model as described above and 2) an

[15] The reported specification assumes that a household is in the range of eligibility when total household gross income is +/- 10 percent of the relevant elibility threshold. We focus on this parameterization of income eligibility because it is those households within close proximity of the income eligibility threshold which have the clearest incentive to reallocate their assets in order to become eligible for the age pension. We also estimated an alternative specification in which households with an income below the income threshold were considered to be income-eligible for the age pension. These results do not differ substantially from those reported here and are available upon request.

[16] Specifically, we require that the estimated marginal effect of an additional dollar of wealth sum to one across asset types, while the marginal effect of a change in any other independent variable is restricted to sum to zero. Note that while these constraints hold on average, they may not hold for any particular couple.

extended model which allows the effect of reaching pension age to depend on self-reported health status. Marginal effects and t-statistics from the estimation of these models using 2006 (wave 6) HILDA data are presented in Tables 7 to 10 and are discussed in detail below.[17] In Section 4.2, we consider the substantive conclusions arising from this analysis in light of parallel results for 2002 and additional longitudinal evidence for the period 2002 to 2006.

4.1 The Determinants of Asset Portfolios

Given the estimation framework described above, the potential impact of the age pension on asset portfolios is captured in two ways: first, through a measure of income eligibility and second, through measures of age eligibility. Total wealth levels are held constant through the inclusion of our measure of net worth. In effect, our results on asset composition are calculated for households with average levels of wealth.

4.1.1 Education, Gender, and Marital History

Table 7 presents the results of our baseline model for couples. The results indicate that, with the exception of age, partners' characteristics are generally unrelated to a couple's asset portfolio once net worth and income are taken into account. Educational attainment is unrelated to asset allocation, for example, and couples in which the head of household is female (i.e. those in which the female partner is older) allocate their wealth across asset types in the same way as couples in which the head of household is male. Moreover, couple-headed households in which the reference person has been previously married hold their wealth in the same way as other couples.

[Table 7 HERE]

Gender and previous marital history appear to be more important in understanding the portfolios of single-headed households (see Table 8). For example, single women allocate approximately $185,000 AUD more wealth than comparable single men to their homes, while holding almost $149,000 AUD less financial wealth and around $52,000 AUD less in life-style assets. Single women also hold somewhat fewer business assets. Moreover, those who are divorced hold more than $178,000 AUD less financial wealth than those who are widowed and not remarried. Interestingly, single individuals who have never married allocate their wealth across asset types in much the same way as equally wealthy widowers who have not remarried. The exception is that they hold less (approximately $63,000 AUD) in life-style assets. Finally, consistent with our

[17] Marginal effects are calculated for each individual and then averaged over the relevant sub-sample using the sample weights (see Greene, 1997, p. 876). Boot-strapped standard errors (with 500 replications) are used to calculate the reported t-statistics.

results for couples, educational attainment is unrelated to the way in which single individuals hold their assets.

[Table 8 HERE]

4.1.2 Income and Income Eligibility

We turn now to consider the effects of income. Our baseline specification accounts both for the linear effect of total family gross income as well as any additional effect of having an income level within plus or minus 10 percent of the relevant age-pension income eligibility threshold. We find that, not surprisingly, asset allocation is related to households' current income levels. Comparing households that are equally wealthy, we find that at higher income levels both couples and single individuals hold significantly more wealth in pensions and business assets and significantly less wealth in their own homes (see Tables 7 and 8). In addition, couples allocate more wealth to life-style assets. For example, each additional dollar of income is associated with couples holding $11.79 AUD less housing wealth, $6.61 AUD more pension wealth, $2.61 AUD more financial assets, $2.32 AUD life-style assets, and $0.24 AUD more business assets.[18] Singles individuals reallocate their wealth in much the same way as their income grows, though the magnitude of these effects are smaller.

Do households that have incomes close to the age-pension income eligibility threshold allocate their wealth in particular ways over and above those patterns associated with income levels more generally? Among couples, we do not find any significant effect of having a household income in the range of income eligibility on asset portfolios. However, among singles, we find that being within the income eligibility range is associated with holding significantly less wealth in one's own home (approximately $437,000 AUD) and more in both financial wealth (approximately $378,000 AUD) and life-style assets (approximately $53,000 AUD). This small increase in life-style assets is consistent with the incentives inherent in the age-pension means test, though the sharp drop in house equity is not.

4.1.3 Age and Age Eligibility

Given the cross-sectional nature of our analysis, we cannot explicitly control for birth cohorts. As a result, any estimated effect of age on the level of any particular asset captures both differences across birth cohorts in the allocation of assets as well as any effect due to aging (life-cycle stages).

[18] Note that these marginal effects are constrained to sum to zero in order to hold net worth constant. In other words, these results indicate how couples (with average net worth) reallocate their constant net worth across asset types as their income grows.

This implies that in order to understand the potential effect of reaching pension age on asset allocation, it is necessary to also account for the effects of aging more generally. Consequently, our baseline specification controls for a quadratic in age as well as indicator variables which reflect whether or not the head of household (and his or her spouse) have reached the relevant pension age.[19]

We find that, not surprisingly, there is a relationship between household members' age and the way that household wealth is allocated. Everything else equal, each additional year of age for heads is associated with couples holding more financial wealth (approximately $40,000 AUD) and less pension wealth (approximately $22,000 AUD) (see Table 7). Single individuals also reallocate more of their net worth to financial wealth and less of their net worth to pension wealth as they age (see Table 8). These results are consistent with the opportunities that many Australian households have to convert employer-based pension wealth at retirement to lump sum benefits which can be invested in the financial market to provide a future income stream.

It is striking, however, that in general there is little additional effect of couples or single individuals reaching pension eligibility age over and above this effect of aging more generally. Thus, for the vast majority of Australians aged 55 - 74 there is no additional effect of reaching pension age on portfolio allocations. The disparity in the asset portfolios of younger and older households in this age range appears to largely stem from life-cycle changes (i.e. aging) rather than from changes associated specifically with reaching pension eligibility age. The exception is that couples in which both partners have reached pension age hold more financial wealth (approximately $235,000 AUD) and less pension wealth (approximately $428,000 AUD) than otherwise similar couples in which only the oldest partner has reached pension age. It is important to note, however, that there are no significant differences in the housing equity or life style assets of these couples. This suggests that although the forms of income generating wealth differ by the age eligibility of spouses, there appears to be no difference in the propensity to hold housing and life-style assets relative to assets which generate an income stream. These patterns do not appear to be consistent with the incentives inherent in the age pension means tests.

4.1.4 Health Status

In Australia, age pensioners also receive subsidies for health care, pharmaceuticals, public transport, utilities and rent assistance which may lead those in poor health to have an additional incentive to qualify for an age pension in order to take advantage of these various additional, lump-sum benefits. We investigate this by assessing whether there is evidence of an interaction between poor health and having reached pension age on asset portfolios. Specifically, results (marginal effects

[19] Accounting for aging through a cubic and quartic resulted in substantially the same results. In all cases, we report a marginal effect of age which accounts for both terms in the quadratic.

and t-statistics) from our second specification which allows for this interaction are presented in Tables 9 (couples) and 10 (singles). We compare these results to those from our baseline model (see Tables 7 and 8).

Using our baseline specification and ignoring interaction effects, we find that couple-headed households in which at least one member is in poor health have approximately $164,000 AUD more equity in their homes and almost $49,000 AUD less in life-style assets than similar couples with equal net worth in which both partners are in good health (see Table 7). These differences reflect the effects of poor health generally on couples' optimal asset allocation. Interestingly, there is no significant effect of poor health on the asset allocation of single individuals (see Table 8).

Adding an interaction term to this baseline specification allows us to distinguish the asset portfolios of households that have reached pension age in good health from those that have reached pension age in poor health.[20] This exercise sheds light on whether or not the health care benefits associated with the age pension seem to be associated with those in poor health (and who presumably most value these additional health care benefits) holding their wealth differently to similar pensioners in good health. At the same time, the presence of an interaction term alters the interpretation of the estimated coefficient on pension eligibility age and poor health making these effects not directly comparable across models.[21]

The results indicate that in general there is no relationship between having reached pension age and the asset allocation of either couples of single individuals who report that they are in good health. The exception is that healthy couples hold less pension and more financial wealth once the spouse also reaches pension age in comparison to healthy couples in which only the head is of pension age (see Table 9). As discussed above (see Section 4.1.3) these patterns are not consistent with the incentives generated by the means tests underlying the age pension rules. Given this, there is little to suggest that the means test underlying the Australian age pension is leading healthy households to reallocate assets.

Table 9 and 10 Here

On the other hand, there is evidence that poor health affects the asset allocations of younger households that have not yet reached pension age. Couples in which neither partner is of pension age have approximately $230,000 AUD more equity in their homes and approximately $61,000 AUD less in life-style assets if at least one partner reports being in poor health. In contrast, single individuals who are below pension age and in poor health have approximately $258,000 AUD more

[20] In the case of couples, we interact poor health status (specifically, at least one partner reporting poor health) with the pension eligibility indicator for each partner.

[21] In particular, in the interacted model the estimated coefficient on pension eligability age relects the effect for healthy households, while the estimated coefficient on poor health reflects the effect for households less than pension age.

financial wealth than healthy singles of a similar age. This advantage in financial wealth position is balanced by a reduction in all other asset types. These health effects on portfolio allocations are unlikely to be generated by the incentive to claim an age pension because these households have not reached the age at which it is possible to claim the age pension.

This relationship between poor health and asset allocation differs in households that have reached pension age, however. In particular, single individuals who are above pension age and in poor health hold significantly less financial wealth and significantly more housing than younger singles who are also in poor health. So the effect of poor health in increasing the financial wealth position of singles is concentrated amongst those below pension age. Singles above pension age who are in poor health have substantially more of their net worth in housing and substantially less in financial assets both of which are consistent with the age-pension means test.

In contrast, there is very little difference in the effect of poor health on the asset allocations of older versus younger couples. Among those in poor health, financial wealth is somewhat higher and home equity is somewhat lower if the head of household has reached pensionable age, however, these difference are almost completely reversed once his or her spouse reaches pensionable age. Thus, to the extent that poor health provides additional incentives reshape assets in order to quality for the Australian age pension, this appears to be concentrated among single-headed households.

4.1.5 Summary

Taken together, these results provide little support for the view that households are reallocating their portfolios in order to maximize their eligibility for the Australian age pension. There is evidence that singles over pension age and in poor health hold significantly more equity in their own homes and significantly fewer financial assets than singles who are in poor health, but who are not above pension age. Moreover, single-headed households with income in the eligible range allocate slightly more wealth to life-style assets. Both effects are consistent with the incentives inherent in the age pension asset test. At the same time, single-headed households who are income-eligible for the age pension have significantly less equity in their homes and significantly more financial wealth which is not consistent with the preferential treatment of primary residences. Moreover, we do not see similar patterns in couples' asset holdings. Couples who have incomes that would qualify them for the age pension allocate their wealth across assets in the same way as couples who are not and there is no relationship between heads of households having reached pension age on the asset portfolios of couples. Finally, we do not see a significant effect of the household head having reached pension age on the asset holdings of either couple- or single-headed households in which the head (and his or her partner) are in good health.

Thus, there is little evidence that the means test underlying the Australian age pension is leading healthy households or couples to reallocate assets. If there is any effect of the incentives

inherent in the age-pension means test, these appear to predominately affect the behavior of single individuals who are in poor health.

4.2 Sensitivity Analysis

We conduct two additional analyses in order to gage the robustness of our conclusions. First, we conduct a parallel analysis using our 2002 HILDA data. Although there were slight adjustments to the age-pension means test between HILDA waves, the same general incentives for asset reallocation were also present in 2002. Thus, an analysis of 2002 provides some reassurance that our conclusions are not specific to the particular economic conditions that existed in 2006. Second, we use the limited number of households that did not change types and that provided wealth data in both waves to test whether there are significant differences between 2002 and 2006 in the asset accumulation (or deccumulation) of households that did and did not reach pension age.

The 2002 results are presented in Tables A1 - A4 in the appendix. Like our 2006 results, estimates based on wave 2 of HILDA do indicate some independent effect of spouses reaching pension age on the portfolio allocation of couples (see Table A1). In particular, couples in which both partners were eligible for the age pension held significantly more housing and significantly less pension wealth than did other couples in which only the head has reached pension age. Unlike the case in 2006, in 2002 single individuals who had reached pension age held significantly more wealth in their own homes than did other singles (see Table A2) which is consistent with the preferential treatment of housing in the age pension means tests. In addition, when we account for the potential interaction between the effects of poor health and pension age eligibility, we find that in 2002 there was an effect of reaching pension age on the asset allocations of healthy households. Specifically, healthy households (both single- and couple-headed) in which the head is above pension age held substantially more wealth in their homes than healthy households that were younger. Higher levels of home equity among these households is consistent with preferential treatment of housing wealth in the means tests underlying the age pension. Thus, our 2002 results are broadly consistent with those based on 2006 data. The exception is that in 2002 there is also evidence that healthy households above pension age held significantly more wealth in their homes than did otherwise similar younger households. In 2006 any effect of the age pension means test on home equity appears to have been concentrated among single-headed households in poor health

Tables A1 - A4 Here

Unfortunately, the sample of households that did not change their status, i.e., were either single- or couple-headed in both waves, and reported wealth data in both waves 2 and 6 is relatively small.[22] Consequently, it is not possible to undertake the simultaneous estimation of a

[22] There are 539 couple-headed and 344 single-headed households meeting both conditions.

system of asset change equations. Instead, we create an indicator variable identifying those households in which at least one member has become eligible for the age pension versus those in which there was no change in eligibility between the two waves. We then test whether the specific assets of those households which become eligible grew (or shrank) in way that differed from the assets held by households which remained ineligible.

Table 11 presents the average change in net worth and asset levels between 2006 and 2002 for those households present in both HILDA waves. Among couples, we find a (real) increase in all assets except business equity irrespective of pension eligibility status. However, we do not find any statistically significant differences in the magnitude of these changes between those households which have become eligible for the age pension and those which have not (see p-values in the third column). The same result holds for singles with the exception that levels of financial wealth appear to have increased more among households which have become eligible for the age pension.

[Table 11 about here]

Taken together, these longitudinal comparisons seem to corroborate the main findings from our cross-sectional analysis of 2006 HILDA data that the variation the portfolio choices of Australian households provides little evidence that the asset and income tests underlying the age pension are triggering substantial changes in the way households hold their wealth.

5 Conclusions

The ability of government pension reforms to shape households' retirement savings depends in large part on the way that households alter savings levels and asset allocations in response to specific institutional arrangements. In particular, means testing can help governments reduce their overall pension costs by way of increased targeting, but may also provide the incentive for households to reallocate their wealth in particular ways. We contribute to the growing literature on the effects of public pension systems on household savings by using detailed nationally-representative data for Australia to estimate a system of asset equations which are constrained to add up net worth. By making comparisons across equally wealthy households, we are able to focus attention on whether or not households appear to reallocate assets in order to qualify for a public pension.

Taken together, our results provide very little evidence that in 2006 healthy households or couples are responding to the incentives embedded in the asset and income tests used to determine Australian age pension eligibility by reallocating their assets. While there are some significant differences in asset portfolios associated with having an income near the income threshold, being of pensionable age, and being in poor health these differences are often only marginally significant, are not robust across time, and are not clearly consistent with the incentives inherent in the

Australian age pension eligibility rules. Any behavioral response to the incentives inherent in the age-pension means test in 2006 appears to be predominately concentrated among single pensioners who are in poor health. In 2002 there is also evidence that healthy households above pension age held significantly more wealth in their homes than did otherwise similar younger households perhaps suggesting some reduction in the incentives to reallocate assets over time.

At the same time it is important to note that our analysis has focused on the asset allocation of Australians aged 55 to 74. This allows us to reduce concerns about unobserved heterogeneity by focusing on a relatively narrow age band around pension age while at the same time maintaining an adequate estimation sample. However, if households are making portfolio decisions in response to the means test more than 10 years before reaching pension age, our estimates understate the effect of the means test on asset allocation. Given the large numbers of Australians who appear to delay planning for retirement (Cobb-Clark and Stillman, 2009), we do not think this is likely, but we cannot be certain. Moreover, we have had nothing to say about the effect of the Australian age pension on overall retirement savings. Much of the Australian public debate has centered on the incentives to reallocate assets in response to the age-pension means test (see Atkinson, Creedy, and Knox, 1995; Barrett and Tseng, 2008; Cho and Sane, 2009), however, it seems sensible to expect some effect on savings levels as well.

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6 Figures and Tables

Table 1: Descriptive Statisitcs by Age Group (Couple-Headed Households)

	2002				2006			
	55-64	**Std.Dev**	**65-74**	**Std.Dev**	**55-64**	**Std.Dev**	**65-74**	**Std.Dev**
Demographics								
Age	59.05	2.80	69.13	2.92	59.34	2.80	69.13	2.77
Spouse Age	54.40	5.56	64.90	5.00	54.94	5.12	64.47	5.27
Education	11.34	2.63	10.71	2.65	11.75	2.49	11.02	2.77
Spouse Education	11.19	2.45	10.50	2.60	11.64	2.45	10.82	2.49
Female	0.19	0.40	0.21	0.41	0.22	0.41	0.20	0.40
Homeowners	0.89	0.32	0.91	0.29	0.91	0.29	0.91	0.29
Health and Retirement								
Retired	0.37	0.48	0.83	0.38	0.32	0.47	0.80	0.40
Spouse Retired	0.36	0.48	0.78	0.41	0.26	0.44	0.75	0.43
Both Retired	0.22	0.42	0.70	0.46	0.17	0.37	0.67	0.47
Poor Health	0.30	0.46	0.27	0.44	0.27	0.44	0.33	0.47
Spouse Poor Health	0.22	0.41	0.25	0.43	0.19	0.40	0.24	0.43
Place of Residence								
New South Wales	0.31	0.46	0.36	0.48	0.32	0.47	0.38	0.48
Victoria	0.25	0.43	0.27	0.44	0.26	0.44	0.24	0.43
Queensland	0.19	0.40	0.14	0.34	0.19	0.39	0.16	0.36
South Australia	0.07	0.25	0.10	0.29	0.07	0.26	0.09	0.29
Western Australia	0.12	0.32	0.11	0.31	0.12	0.33	0.11	0.32
Tasmania	0.03	0.16	0.03	0.17	0.02	0.14	0.01	0.12
Northern Territories	0.01	0.08	0.00	0.00	0.01	0.11	0.00	0.00
Australian Capital Territory	0.03	0.16	0.00	0.06	0.01	0.09	0.01	0.11
N	548		379		511		356	

Note: Calculations are based on wave 2 and wave 6 of the HILDA survey

Table 2: Descriptive Statisitcs by Age Group (Single-Headed Households)

	2002				2006			
	55-64	**Std.Dev**	**65-74**	**Std.Dev**	**55-64**	**Std.Dev**	**65-74**	**Std.Dev**
Demographics								
Age	59.16	2.99	69.71	2.83	59.52	2.78	69.33	2.92
Education	11.03	2.70	10.36	2.60	11.14	2.63	10.88	2.51
Female	0.62	0.49	0.70	0.46	0.62	0.49	0.67	0.47
Homeowners	0.66	0.47	0.77	0.42	0.69	0.46	0.73	0.45
Never Married	0.15	0.36	0.11	0.31	0.16	0.36	0.10	0.30
Widowed	0.23	0.42	0.59	0.49	0.25	0.43	0.55	0.50
Divorced	0.62	0.49	0.30	0.46	0.60	0.49	0.35	0.48
Health and Retirement								
Retired	0.42	0.50	0.88	0.32	0.40	0.49	0.87	0.34
Poor Health	0.31	0.46	0.34	0.47	0.32	0.47	0.35	0.48
Place of Residence								
New South Wales	0.32	0.47	0.42	0.49	0.32	0.47	0.33	0.47
Victoria	0.22	0.42	0.21	0.41	0.28	0.45	0.22	0.42
Queensland	0.23	0.42	0.17	0.37	0.18	0.39	0.22	0.41
South Australia	0.08	0.27	0.08	0.27	0.09	0.29	0.08	0.27
Western Australia	0.10	0.30	0.09	0.29	0.10	0.30	0.12	0.33
Tasmania	0.03	0.17	0.03	0.16	0.02	0.14	0.01	0.12
Northern Territories	0.01	0.11	0.00	0.00	0.01	0.10	0.01	0.10
Australian Capital Territory	0.01	0.09	0.01	0.10	0.01	0.07	0.01	0.08
N	306		276		336		266	

Note: Calculations are based on wave 2 and wave 6 of the HILDA survey

Table 3: Wealth Holding by Subjective Health Status (Couple-Headed Households)

	2002				2006			
	Poor/Fair	**Std.Dev**	**Good**	**Std.Dev**	**Poor/Fair**	**Std.Dev**	**Good**	**Std.Dev**
Net Wealth								
Mean Total Net Wealth	612931	786576	947683	970511	761878	885893	1124719	940733
Median Total Net Wealth	375404	157000	688543	233219	498280	199350	837482	266700
Mean Asset Portfolio								
Total Financial Wealth	115224	283515	185508	402832	113203	326342	169881	357838
Interest-earning assets (Banks)	45326	140993	54734	118993	46307	93293	52270	105198
Interest-earning assets (Other)	5527	40418	6312	40230	1395	10399	3725	48572
Equity in Stocks	59990	183610	96055	241129	65378	291329	112447	312259
Other assets	12981	110470	40799	228211	6479	31641	16328	98404
Unsecured debts	8600	37332	12393	51189	6356	17634	14889	64816
Business	11496	76396	79606	384698	17374	98928	49640	217258
Own Home	284567	318254	329192	279938	346320	307547	434013	307410
Total Life Style	75132	221608	134980	264944	122772	309191	172453	345876
Other Real Estate	49353	186834	100568	253882	96585	287072	139288	337827
Vehicles	25779	61269	34411	64150	26187	48339	33166	45230
Superannuation	126513	257142	218398	303930	162209	293031	298732	386381
Proportion Owning								
Financial Wealth	0.997	0.050	0.999	0.033	1.000	0.000	0.995	0.068
Business	0.060	0.238	0.176	0.381	0.077	0.267	0.164	0.371
Own Home	0.867	0.340	0.915	0.279	0.864	0.343	0.932	0.251
Lifestyle	0.954	0.210	0.974	0.160	0.967	0.180	0.994	0.078
Superannuation	0.632	0.483	0.780	0.415	0.685	0.465	0.863	0.344
Current Income	52792	62622	75498	62323	57265	64474	83684	67909
N	369		558		332		535	

Note: Own calculation based on wave 2 of HILDA data. Poor/fair health status if at least one partner rated his health as poor or fair. All figures are reported in constant 2006 Australian dollars

Table 4: Wealth Holding by Subjective Health Status (Single-Headed Households)

	2002				2006			
	Poor/Fair	**Std.Dev**	**Good**	**Std.Dev**	**Poor/Fair**	**Std.Dev**	**Good**	**Std.Dev**
Net Wealth								
Mean Total Net Wealth	296539	455591	471534	668703	336520	455053	607618	727055
Median Total Net Wealth	151987	124616	275085	161859	223153	194680	379919	239600
Mean Asset Portfolio								
Total Financial Wealth	60737	162328	112585	267428	61685	179552	123648	263716
Interest-earning assets (Banks)	19977	41321	29923	69866	20366	50582	36759	86222
Interest-earning assets (Other)	384	3436	5050	37521	2694	17667	3339	24550
Equity in Stocks	32385	117680	70660	237067	35487	148659	80972	212972
Other assets	11533	60763	10116	43594	5761	56845	8267	40187
Unsecured debts	3542	17220	3165	20064	2622	7206	5689	24760
Business	17889	199301	25131	171658	352	4061	16506	96686
Own Home	149071	181925	215087	228406	182411	205847	283087	306547
Total Life Style	28534	78250	53205	243940	42581	133313	77498	239989
Other Real Estate	17543	74893	40159	242946	32276	129564	61895	232505
Vehicles	10991	17428	13047	18538	10305	13441	15603	22197
Superannuation	40308	117530	65527	159605	49491	137321	106879	231479
Proportion Owning								
Financial Wealth	0.961	0.194	0.987	0.114	0.978	0.148	0.987	0.114
Business	0.050	0.218	0.050	0.219	0.016	0.124	0.067	0.251
Own Home	0.616	0.488	0.758	0.429	0.610	0.489	0.752	0.433
Lifestyle	0.778	0.416	0.830	0.376	0.792	0.407	0.882	0.323
Superannuation	0.328	0.471	0.513	0.500	0.404	0.492	0.621	0.486
Current Income	21103	20914	33160	32634	23548	30987	41007	55626
N	184		398		196		406	

Note: Own calculation based on wave 2 of HILDA data. All figures are reported in constant 2006 Australian dollars

Table 5: Wealth Holding by Age (Couple-Headed Households)

	2002				2006			
	55-64	**Std.Dev**	**65-74**	**Std.Dev**	**55-64**	**Std.Dev**	**65-74**	**Std.Dev**
Net Wealth								
Mean Total Net Wealth	891434	969935	684294	805118	1026318	930768	911846	939738
Median Total Net Wealth	617918	229359	422896	178500	755250	256955	647800	259527
Mean Asset Portfolio								
Total Financial Wealth	161339	406518	149394	273507	120593	284004	184631	416800
Interest-earning assets (Banks)	53564	137935	46694	112314	44198	78730	57907	124818
Interest-earning assets (Other)	4211	38551	8751	42750	1825	34063	4154	43279
Equity in Stocks	77903	214804	86452	227940	74824	232509	120015	383242
Other assets	41668	240082	10304	39261	15233	95934	8319	44349
Unsecured debts	16007	55078	2808	24407	15486	56996	5763	41982
Business	71172	364181	21341	155847	49530	205701	18482	133638
Own Home	318443	300309	299128	291566	393808	304463	405807	318631
Total Life Style	120828	229057	94250	278274	176139	339666	119021	319151
Other Real Estate	84056	195016	72547	275862	141971	326038	94047	306831
Vehicles	36771	78443	21703	21843	34169	49616	24974	41443
Superannuation	219652	302608	120181	255551	286247	381804	183906	312122
Proportion Owning								
Financial Wealth	0.999	0.033	0.997	0.051	0.997	0.056	0.998	0.048
Business	0.165	0.371	0.071	0.258	0.179	0.384	0.059	0.235
Own Home	0.889	0.315	0.906	0.292	0.904	0.295	0.907	0.291
Lifestyle	0.968	0.176	0.961	0.193	0.985	0.122	0.980	0.139
Superannuation	0.852	0.355	0.513	0.500	0.908	0.289	0.627	0.484
Current Income	78289	71526	47376	41780	90259	77347	48739	40269
N	548		379		511		356	

Note: Own calculation based on waves 2 and 6 of HILDA data. All figures are reported in constant 2006 Australian dollars

Table 6: Wealth Holding by Age (Single-Headed Households)

	2002				2006			
	55-64	**Std.Dev**	**65-74**	**Std.Dev**	**55-64**	**Std.Dev**	**65-74**	**Std.Dev**
Net Wealth								
Mean Total Net Wealth	428472	615859	399912	611573	584648	753879	432331	507972
Median Total Net Wealth	224619	145700	240818	146295	339925	247200	313775	194750
Mean Asset Portfolio								
Total Financial Wealth	96808	259754	94910	214618	108532	265658	96441	204636
Interest-earning assets (Banks)	22239	61338	32005	63078	32236	89585	30244	55785
Interest-earning assets (Other)	5200	41076	1616	10473	3923	27526	2090	13387
Equity in Stocks	61627	222024	54542	188312	72412	213282	57695	168921
Other assets	12976	54215	7746	43755	6962	49778	8071	41402
Unsecured debts	5233	25595	999	4711	7000	26982	1658	5249
Business	31582	181251	12495	180173	16449	101385	4352	33617
Own Home	176314	219285	214531	212019	260537	325014	236260	211160
Total Life Style	38107	96923	53712	285198	79137	200783	48932	223894
Other Real Estate	24239	92413	43066	284888	62099	197479	39208	213709
Vehicles	13869	20370	10645	15114	17038	22171	9723	15565
Superannuation	85659	182061	24264	81163	119994	237464	46347	149230
Proportion Owning								
Financial Wealth	0.971	0.167	0.987	0.113	0.980	0.140	0.989	0.105
Business	0.078	0.268	0.017	0.131	0.067	0.250	0.029	0.168
Own Home	0.664	0.473	0.769	0.422	0.687	0.465	0.729	0.445
Lifestyle	0.867	0.340	0.750	0.434	0.866	0.341	0.834	0.373
Superannuation	0.611	0.488	0.269	0.444	0.696	0.461	0.360	0.481
Current Income	34952	34615	22635	21399	42133	58974	26325	31530
N	306		276		336		266	

Note: Own calculation based on waves 2 and 6 of HILDA data. All figures are reported in constant 2006 Australian dollars

Table 7: (Average) Determinants of Asset Portfolios: Couple-Headed Households (Marginal Effects and t-Statistics), Wave 6

	Financial Wealth		Business Assets		Own Home		Life Style		Superannuation	
	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat
Income										
Total Income	2.61	1.79	0.24	2.23	-11.79	-4.86	2.32	4.17	6.61	5.91
Eligibility Range	-145136.03	-1.15	13998.26	0.61	-4975.75	-0.04	31446.78	0.88	104666.74	1.28
Demographics										
Age	39629.02	2.62	-3335.78	-1.67	-10507.50	-0.58	-4150.97	-0.89	-21634.77	-1.62
Education	-9355.70	-0.48	431.23	0.21	4265.03	0.21	-6955.13	-1.13	11614.57	0.80
Head Eligible for AP	68111.98	0.45	4500.38	0.22	-83066.40	-0.52	-9821.39	-0.18	20275.44	0.15
Spouse Eligible for AP	235652.70	2.23	-12785.71	-0.95	158141.61	1.16	47288.00	0.96	-428296.62	-2.86
Female Head	-37389.86	-0.41	-11100.19	-0.89	93173.52	0.94	31026.96	1.09	-75710.45	-0.99
Previoulsy Married	-81627.87	-0.97	8310.91	0.63	7718.57	0.09	3487.63	0.13	62110.78	0.78
Poor Health	-24006.09	-0.32	-19663.02	-1.77	163969.06	2.10	-48306.20	-1.89	-71993.75	-0.97
Net Worth	-0.37	-0.70	0.00	2.92	0.53	20.66	0.72	1.40	0.12	5.60
N	861		861		861		861		861	
R^2	0.06		0.07		0.26		0.18		0.36	

Note: Eligible to AP if at least one partner is eligible. Poor health if one member reports being in poor health (see text for precise definition). All figures are reported in constant 2006 Australian dollars

Table 8: (Average) Determinants of Asset Portfolios: Single-Headed Households (Marginal Effects and t-Statistics), Wave 6

	Financial Wealth		Business Assets		Own Home		Life Style		Superannuation	
	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat
Income										
Total Income	2.75	0.77	0.25	1.77	-8.75	-1.86	0.60	0.55	5.16	5.74
Eligibility Range	378135.53	3.71	11933.07	1.05	-437155.09	-3.65	53481.86	1.79	-6395.36	-0.08
Demographics										
Age	34673.14	2.28	-109.39	-0.30	-3981.05	-0.25	-6256.18	-1.79	-24326.52	-3.38
Education	14711.75	1.15	29.43	0.06	-19540.25	-1.37	4847.75	1.19	-48.67	-0.01
Eligible for AP	-155910.78	-1.03	-1007.10	-0.24	197115.25	1.36	-27737.38	-0.72	-12459.99	-0.16
Divorced	-178886.25	-2.31	2094.16	0.82	97903.62	1.20	27126.40	1.15	51762.07	1.08
Never Married	55325.46	0.51	-2536.11	-0.77	14439.38	0.11	-62988.01	-1.84	-4240.72	-0.06
Female	-149124.44	-1.85	-6317.75	-1.93	185152.72	2.15	-51796.62	-2.44	22086.10	0.52
Poor Health	52927.32	0.69	-3561.91	-1.76	48410.76	0.58	-21678.88	-0.90	-76097.30	-1.63
Net Worth	-0.51	-1.18	0.00	0.98	0.49	20.73	0.86	5.52	0.16	0.46
N	595		595		595		595		595	
R^2	0.08		0.07		0.33		0.26		0.29	

Note: All figures are reported in constant 2006 Australian dollars

Table 9: (Average) Determinants of Asset Portfolios: Couple-Headed Households (Marginal Effects and t-Statistics), Wave 6

	Financial Wealth		Business Assets		Own Home		Life Style		Superannuation	
	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat
Income										
Total Income	2.50	1.73	0.25	2.22	-11.69	-4.88	2.31	4.19	6.63	5.92
Eligibility Range	-141331.58	-1.12	13839.41	0.61	-13456.91	-0.11	32163.31	0.90	108785.77	1.33
Demographics										
Age	37656.17	2.49	-3253.62	-1.64	-8324.15	-0.46	-4496.14	-0.96	-21582.26	-1.61
Education	-7344.30	-0.38	317.42	0.16	2594.21	0.13	-6722.90	-1.08	11155.56	0.77
Head Eligible for AP	-168475.19	-1.04	17030.52	0.66	169032.50	1.01	-44949.96	-0.67	27362.13	0.18
Spouse Eligible for AP	453493.22	3.30	-22320.67	-1.05	-162750.97	-1.03	86936.36	1.50	-355357.91	-2.06
Female Head	-33414.71	-0.37	-11287.40	-0.91	88662.33	0.91	31567.04	1.10	-75527.25	-0.99
Previoulsy Married	-80140.34	-0.95	8247.01	0.62	4541.50	0.05	3843.26	0.14	63508.56	0.79
Poor Health	-146297.64	-1.22	-11597.51	-0.67	229720.64	2.08	-60688.36	-1.75	-11137.15	-0.13
Elig.xPoor Health	590740.94	2.82	-31582.39	-1.24	-622003.56	-2.61	87126.63	0.99	-24281.66	-0.11
Spouse Elig.xPoor Health	-473621.78	-2.35	20658.08	0.90	704226.25	2.84	-86233.26	-0.92	-165029.33	-0.65
Net Worth	-0.41	-0.77	0.00	3.01	0.54	20.58	0.76	1.46	0.12	5.71
N	861		861		861		861		861	
R^2	0.07		0.07		0.26		0.19		0.36	

Note: Eligible to AP if at least one partner is eligible. Poor health if one member reports being in poor health (see text for precise definition). All figures are reported in constant 2006 Australian dollars

Table 10: (Average) Determinants of Asset Portfolios: Single-Headed Households (Marginal Effects and t-Statistics), Wave 6

	Financial Wealth		Business Assets		Own Home		Life Style		Superannuation	
	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat
Income										
Total Income	3.45	1.01	0.24	1.70	-9.39	-2.08	0.58	0.53	5.12	5.64
Eligibility Range	383312.06	3.92	11885.50	1.04	-441710.00	-3.77	53527.20	1.79	-7014.76	-0.09
Demographics										
Age	34431.27	2.32	-106.43	-0.29	-3810.37	-0.24	-6258.96	-1.78	-24255.51	-3.35
Education	13471.00	1.07	44.00	0.09	-18496.23	-1.31	4872.95	1.20	108.28	0.01
Eligible for AP	-19389.14	-0.12	-2455.92	-0.49	81550.64	0.54	-28404.18	-0.66	-31301.39	-0.39
Divorced	-180069.22	-2.33	2100.05	0.82	99228.78	1.21	27090.13	1.14	51650.26	1.07
Never Married	55356.40	0.51	-2540.05	-0.77	14543.77	0.12	-62955.89	-1.84	-4404.22	-0.07
Female	-161596.08	-2.06	-6187.17	-1.88	195830.06	2.30	-51723.57	-2.42	23676.75	0.55
Poor Health	257652.02	2.25	-5728.56	-1.89	-125320.01	-1.04	-22739.51	-0.70	-103863.94	-1.64
Elig.xPoor Health	-389720.16	-2.77	4116.17	1.10	330662.91	2.17	1926.34	0.04	53014.71	0.61
Net Worth	-0.50	-1.18	0.00	0.96	0.49	20.48	0.87	5.59	0.15	0.44
N	595		595		595		595		595	
R^2	0.09		0.07		0.34		0.26		0.29	

Note: All figures are reported in constant 2006 Australian dollars

Table 11: Changes in Assets Holding by Change in Eligibility to AP

	Couples			Singles		
	Change in Eligibility			Change in Eligibility		
	Yes	No	P-value	Yes	No	P-value
Wealth	127333	180946	0.314	133259	81921	0.264
Financial Wealth	24222	20772	0.941	37086	-7841	0.047
Business	-21745	-12782	0.649	-10082	972	0.552
Own Home	65846	95090	0.426	64153	56289	0.554
Lifestyle	33567	35645	0.942	39115	11263	0.508
Superannuation	25443	42220	0.513	2986	21238	0.301
N	120	419		75	269	

Note: Own calculation based on waves 2 and 6 of HILDA data. All figures are reported in constant 2006 Australian dollars

6.1 Appendix

Table A1: (Average) Determinants of Asset Portfolios: Couple-Headed Households (Marginal Effects and t-Statistics), Wave 2

	Financial Wealth		Business Assets		Own Home		Life Style		Superannuation	
	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat
Income										
Total Income	-6.61	-5.36	-0.30	-1.30	11.15	10.89	-1.31	-3.68	-2.92	-3.68
Eligibility Range	95501.17	0.91	30952.27	0.85	-55373.81	-0.50	64801.84	2.22	-135881.48	-1.39
Demographics										
Age	54478.77	4.63	-3642.65	-1.28	10226.66	0.75	-5529.66	-1.16	-55533.11	-5.58
Education	17068.38	1.36	6178.18	2.50	-62570.84	-5.38	1669.32	0.35	37654.96	3.78
Head Eligible for AP	-143700.62	-1.27	-7386.77	-0.23	191065.69	1.48	5388.78	0.12	-45367.08	-0.41
Spouse Eligible for AP	50306.55	0.65	-14319.88	-0.59	172981.31	1.74	-10547.18	-0.34	-198420.80	-2.22
Female Head	-143079.19	-1.64	13885.23	0.71	108421.59	1.12	33298.81	1.05	-12526.43	-0.20
Previoulsy Married	-12499.88	-0.18	13254.28	0.68	-130242.16	-1.57	624.99	0.02	128862.77	1.96
Poor Health	-174000.62	-2.64	-56909.10	-4.02	496760.03	6.47	-56121.23	-2.16	-209729.08	-3.93
Net Worth	0.20	5.24	0.00	2.55	0.63	15.54	0.07	5.53	0.10	6.31
N	921		921		921		921		921	
R^2	0.13		0.05		0.24		0.04		0.25	

Note: Eligible to AP if at least one partner is eligible. Poor health if one member reports being in poor health (see text for precise definition). All figures are reported in constant 2006 Australian dollars

Table A2: (Average) Determinants of Asset Portfolios: Single-Headed Households (Marginal Effects and t-Statistics), Wave 2

	Financial Wealth		Business Assets		Own Home		Life Style		Superannuation	
	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat
Income										
Total Income	-7.15	-8.79	0.90	1.06	3.05	2.44	0.44	1.11	2.75	2.57
Eligibility Range	-13330.99	-0.13	9889.23	0.51	-60237.83	-0.60	48460.62	1.84	15218.97	0.23
Demographics										
Age	18889.51	2.48	-2123.35	-1.68	625.27	0.08	-1530.34	-0.58	-15861.09	-3.60
Education	15722.66	1.80	-783.04	-0.68	-21640.70	-2.34	1579.70	0.53	5121.39	1.07
Eligible for AP	-158468.58	-1.56	5775.53	0.43	227304.70	2.21	-26835.48	-0.91	-47776.17	-0.91
Divorced	-31173.88	-0.55	-5529.88	-0.81	-7644.69	-0.15	12039.67	0.72	32308.79	1.07
Never Married	-14001.28	-0.17	-15979.47	-1.82	131081.69	1.44	-57901.32	-2.19	-43199.61	-1.03
Female	-76110.82	-1.27	-22638.27	-2.84	108310.60	1.73	-14885.30	-0.86	5323.79	0.18
Poor Health	-9428.93	-0.17	5132.29	0.85	31268.34	0.55	12942.46	0.78	-39914.16	-1.46
Net Worth	0.37	16.40	0.00	2.63	0.46	27.91	0.09	9.44	0.07	7.60
N	577		577		577		577		577	
R^2	0.19		0.11		0.34		0.18		0.30	

Note: All figures are reported in constant 2006 Australian dollars

Table A3: (Average) Determinants of Asset Portfolios: Couple-Headed Households (Marginal Effects and t-Statistics), Wave 2

	Financial Wealth		Business Assets		Own Home		Life Style		Superannuation	
	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat
Income										
Total Income	-6.64	-5.41	-0.30	-1.29	11.04	10.90	-1.27	-3.58	-2.82	-3.60
Eligibility Range	92774.20	0.89	31380.48	0.87	-63143.55	-0.56	66748.85	2.25	-127759.97	-1.32
Demographics										
Age	54680.91	4.65	-3554.51	-1.23	9860.64	0.73	-5528.82	-1.15	-55458.22	-5.63
Education	17069.15	1.35	6177.31	2.49	-62532.67	-5.43	1622.09	0.34	37664.11	3.85
Head Eligible for AP	-182080.03	-1.48	-13934.43	-0.35	172809.70	1.17	22170.78	0.44	1033.99	0.01
Spouse Eligible for AP	78334.58	0.87	-40354.96	-1.24	395194.59	3.09	-47247.29	-1.26	-385926.94	-3.57
Female Head	-143749.87	-1.64	12693.45	0.64	115781.67	1.20	32588.79	1.03	-17314.04	-0.28
Previoulsy Married	-11281.75	-0.16	11797.44	0.60	-118625.25	-1.44	-1164.50	-0.05	119274.05	1.82
Poor Health	-189854.87	-1.91	-82634.53	-3.87	644727.13	6.03	-67144.68	-1.73	-305093.03	-4.74
Elig.xPoor Health	96062.26	0.59	12989.00	0.30	70205.22	0.42	-45087.26	-0.76	-134169.22	-0.89
Spouse Elig.xPoor Health	-79719.22	-0.50	63162.78	1.52	-557971.94	-3.14	95707.54	1.68	478820.81	2.83
Net Worth	0.20	5.21	0.00	2.28	0.63	15.80	0.06	5.46	0.10	6.24
N	921		921		921		921		921	
R^2	0.13		0.06		0.24		0.05		0.26	

Note: Eligible to AP if at least one partner is eligible. Poor health if one member reports being in poor health (see text for precise definition). All figures are reported in constant 2006 Australian dollars

Table A4: (Average) Determinants of Asset Portfolios: Single-Headed Households (Marginal Effects and t-Statistics), Wave 2

	Financial Wealth		Business Assets		Own Home		Life Style		Superannuation	
	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat	dy/dx	t-stat
Income										
Total Income	-7.11	-8.78	0.90	1.06	3.05	2.47	0.44	1.12	2.71	2.58
Eligibility Range	-16175.27	-0.16	9668.52	0.50	-60636.30	-0.60	48315.15	1.81	18827.90	0.30
Demographics										
Age	18675.03	2.45	-2137.33	-1.69	613.56	0.08	-1542.94	-0.58	-15608.32	-3.48
Education	15874.51	1.82	-785.25	-0.68	-21709.87	-2.34	1598.51	0.54	5022.10	1.05
Eligible for AP	-125286.47	-1.18	7736.83	0.53	228105.48	2.17	-24664.07	-0.74	-85891.77	-1.51
Divorced	-30136.22	-0.54	-5381.22	-0.78	-7084.46	-0.14	12032.95	0.72	30568.95	1.02
Never Married	-5129.44	-0.06	-15439.38	-1.79	131401.09	1.45	-57332.99	-2.16	-53499.28	-1.28
Female	-74753.45	-1.25	-22571.17	-2.86	108276.01	1.72	-14783.70	-0.85	3832.32	0.13
Poor Health	44288.05	0.50	8276.98	0.66	32407.30	0.35	16485.08	0.61	-101457.41	-2.36
Elig.xPoor Health	-94414.23	-0.92	-5486.67	-0.42	-1728.32	-0.02	-6256.55	-0.19	107885.77	1.93
Net Worth	0.38	16.44	0.00	2.73	0.46	27.32	0.09	9.30	0.07	7.52
N	577		577		577		577		577	
R^2	0.18		0.11		0.34		0.18		0.31	

Note: All figures are reported in constant 2006 Australian dollars

Number	Title	Author(s)
(2007)		
No. 168:	Health human resources planning and the production of health: Development of an extended analytical framework for needs-based health human resources planning	S. Birch G. Kephart G. Tomblin-Murphy L. O'Brien-Pallas R. Alder A. MacKenzie
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