PORTFOLIO ALLOCATION IN THE FACE OF A MEANS-TESTED PUBLIC PENSION

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We investigate whether households adjust their asset portfolios just prior to retirement in ways that are consistent with maximizing eligibility for a means-tested public pension. We utilize detailed micro data for a nationally-representative sample of Australian households to estimate a system of asset equations which are constrained to add up to net worth. Our results provide little evidence that healthy households or couples are responding to the incentives embedded in the means tests determining pension eligibility by reallocating assets. While there are some 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 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 appears to be predominately concentrated among single pensioners who are in poor health.

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 statutory retirement age, enhanced incentives for private savings, and greater targeting of public pensions (Whitehouse and Queisser, 2007). Younger cohorts of workers appear to have reacted to this

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).

Means testing, in particular, has been central to reducing the fiscal burden of universal pension provision by targeting limited public resources toward those elderly in the greatest need (Knox, 1995; Sefton *et al.*, 2008; Sefton and van de Ven, 2009). Moreover, nearly all proposals to transform unfunded (public) into funded (private) pension systems retain some form of residual publicly-funded saftey net (Disney, 2000), which inevitably must involve the means testing of benefits. Means testing, however, is administratively complex and results in higher effective marginal tax rates that can lead to disincentives to save before or to accept employment after retirement age (Knox, 1995; Willmore, 2000). Understanding how the design of the pension system affects household behavior is crucial to understanding the consequences of public pension reforms at both the micro and macro level. Unfortunately, however, most of the literature analyzing behaviorial responses to means testing has focused on non-retirement benefits which, although qualitatively similar, may have different quantitative effects (Sefton *et al.*, 2008).

More specifically, a number of studies have quantified the degree of substitution between public pensions and private savings (see Börsch-Supan and Reil-Held, 1998; Williamson, 1999; Attanasio and Brugiavini, 2003; Hurd *et al.*, 2009). Researchers have also investigated the effect of specific pension reforms on retirement ages and savings levels, as well as the level and distribution of retirement incomes (see Beetsma *et al.*, 2001; Bonin *et al.*, 2001; Bingley *et al.*, 2002; Mantovani *et al.*, 2005; Jiménez-Martín and Sánchez Martín, 2007; Sánchez Martín, 2008; Geyer and Steiner, 2010). This previous pension literature, however, is nearly silent on the consequences of means testing per se. An important exception is the recent work of Sefton *et al.* (2008) and Sefton and van de Ven (2009). These authors demonstrate that moving from universal to means-tested public pensions would have differential effects across the wealth distribution, with poorer households saving more and delaying retirement and richer households doing the opposite (Sefton *et al.*, 2008). Moreover, modeling the pension system in the context of the wider tax and benefits system demonstrates that representative households would prefer means-tested rather than universal pension benefits which would imply a substantially greater tax burden (Sefton and van de Ven, 2009). This work is valuable in quantifying the trade-offs associated with increasing the extent of means testing. In practise, however, means tests may not be applied uniformly to all income sources and asset types, raising the potential for households to respond to means testing by altering not only the level—but also the composition—of savings.[1]

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 ways that are consistent with maximizing 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

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[1]In Sefton *et al.* (2008), for example, the extent of means testing is described by: (i) benefit levels; (ii) the taper rate; and (iii) the value of permitted exclusions. They do not consider the nature of the exclusions and the effect that this might have on savings behavior.

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). We also take advantage of the limited longitudinal information available in our data and provide additional evidence on the effect of a change in eligibility for a means-tested public pension on asset portfolios from a simple difference-in-differences exercise.

Australia provides an interesting case for studying these issues because it has had a public—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).[2] 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.[3] Moreover, there are reasons to believe that the specific nature of the Australian means test provides incentives for households to allocate their pre-retirement wealth in particular ways (see Section 2.2).

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 access 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,[4] but is often less useful in understanding how households structure their wealth portfolios. The riskiness of a household's retirement income, however, is ultimately driven by the structure of its asset portfolio.[5] 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 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, and are not clearly consistent with the incentives inherent in the Australian age pension eligibility rules. Any behavioral response to

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[2]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).

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

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

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

the incentives inherent in the age-pension means test appears to be predominately concentrated among single pensioners who are in poor health.

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. In Section 3 we 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 Sections 4 and 5. Our conclusions and suggestions for future research are outlined in Section 6.

2. The Australian Age Pension

The age pension is the first pillar in Australia's retirement income system. It was introduced in 1909 in an effort to alleviate poverty among 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 (see Knox, 1995). The Australian government moved in the 1980s, however, to reverse this trend and increase targeting of the age pension by tightening the income 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 *et al.*, 1999; Bateman and Ablett, 2000; Preston and Austen, 2001). This—along with tax incentives to encourage private savings—is 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 an age pension is first contingent on a residency requirement and age restriction. A claimant must be an Australian resident at the time his or her claim is lodged. The claimant must also have been a resident for a total of at least ten years, including five consecutive years.[6] 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.

The receipt of the age pension is not universal. 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. Furthermore, age pensioners can also receive subsidies for health care, pharmaceuticals, public transport, utilities, and rent. Thus, 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.[7]

In March 2006,[8] single recipients of the age pension received a *maximum basic pension* of $499.70 per fortnight.[9] Partnered recipients received a maximum of

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[6]There are exceptions to this general rule for claimants who were resident in certain countries with which Australia has an International Social Security Agreement, newcomers under special programs, or those widowed in Australia who do not meet the 10 year residency requirement.

[7]See Harmer (2009) for additional details regarding supplementary payments.

[8]The details of the age pension program discussed in this section are relevant for 2006, the period covered by our data sample. All historical rates are taken from the online version of the Guide to Social Security Law (Australian Government, 2010).

[9]All amounts are in Australian dollars.

$417.20 each. These basic pension rates are explicitly set at 25 percent of gross male average weekly earnings (MATWE) for single recipients. They are adjusted every six months in line with changes in the consumer price index or average male earnings—whichever is greater. As mentioned above, eligible single and partnered recipients could also collect an additional $21.30 and $15.80 per fortnight each in the form of a pension supplement and pharmaceutical allowance. Moreover, additional income support is also available to eligible non-homeowners in the form of rent assistance.

The maximum pension payable—the *maximum payment rate*—is the sum of the *maximum basic pension* and all relevant income supplements before consideration is given to the age pension means tests, i.e. before any benefit reduction associated with having income or assets exceeding the relevant thresholds.

2.1. *Income and Asset Tests*

Australians reaching pension age are entitled to receive the *maximum payment rate* so long as their assessable income is less than than an income disregard of $128 per fortnight if they are single and less than $120 per fortnight if they are partnered.[10]

The most common sources of assessable income include: salaries and wages; net income from businesses; the monetary value of non-income benefits; pension income; annuity income; net income from real estate; profits and distributions from private trusts and businesses; and deemed income from financial investments.[11]

In deeming income from financial investments, the Australian government assumes that these investments are earning a specific, fixed rate of return, regardless of the rate that they are actually earning. The first $38,400 of financial investments for a single person or the first $63,800 of financial investments for a couple is deemed to be earning a rate of 3 percent. Remaining financial investments are deemed to be earning 5 percent.

The maximun pension benefits are withdrawn at a rate of $0.40 for singles for each dollar of assessable income in excess of the income disregard of $128 per fortnight. Partnered individuals' assessable income is equal to the *per capita* assessable income of the couple as a whole. Benefit payments are then reduced by $0.20 per fortnight for each dollar of ordinary income in excess of an income disregard of $114 per fortnight. As a result, eligible single individuals receive a partial pension so long as their income is less than $1557.75 per fortnight, while partnered individuals receive a partial pension so long as their income is less than $1301.00 each.

The receipt and level of age pension benefits are also subject to an assets test in which home ownership status plays a central role. In particular, singles (couples) holding less than $161,500 ($229,000) in assets qualify for a full age pension under the asset test if they own their home; these asset thresholds increase to $278,500 ($346,000) if they do not.

It is important to note, however, that the claimant's principal place of residence is exempt from the asset test, implying that the asset test is a function of

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[10]Couples living separately due to illness or respite care are subject to the income threshold for singles.
[11]See Centerlink (http://Centrelinkwww.centrelink.gov.au) for a comprehensive list of all assessable and exempt incomes.

homeowner status, but is independent of the value of the principal residence. The most common assessable assets include financial investments, real estate (holiday/investment properties), any assets held in pension and rollover funds (for those of pensionable age), and personal assets such as home contents and motor vehicles.[12]

Assets exceeding these exemption amounts reduce pension benefits by $3 per fortnight for every $1000 of assets in excess. As a result, we estimate that single homeowners are entitled to a partial pension under the asset test so long as the total value of their assessable assets does not exceed $328,069.[13] Similarly, each partnered homeowner is entitled to a partial pension so long as the total net value of their assessable assets does not exceed $253,566 each.[14]

The final age pension benefit is determined by taking the lowest benefit payable under either the income or the asset test. Benefit levels are subject to periodic revaluation. For example, the value of financial assets and the associated deemed income stream are updated automatically every six months to account for changes in market prices. Moreover, pensioners are also required to report any major changes in their financial circumstances that might affect their pension entitlement within a fortnight. Benefit reviews are conducted each time substantively new information is received.[15]

2.2. *The Incentives to Reallocate Assets*

Sefton and van de Ven (2009) demonstrate that means testing of public pensions has important implications for the level of household savings. However, there is also reason to believe that the way that these income and asset tests are applied generates incentives for households to also structure their given retirement assets in particular ways (see Atkinson *et al.*, 1995; Barrett and Tseng, 2008; Cho and Sane, 2009).

Cho and Sane (2009), for example, argue that the favorable treatment of individuals' principal residence in the age pension asset test leads to higher than average home ownership rates in Australia. One might also expect homeowners to rebalance their portfolios in such a way as to allocate more of their wealth toward their homes and less of their wealth toward other assets upon reaching pension age. Specifically, households may have an incentive to increase their home equity and decrease their equity in other assets which yield an income. This would in effect reduce the value of assets subject to the asset test and decrease the deemed income associated with financial wealth which factors into the income test. Both increase the probability that a household will qualify for the age pension.

The government's income deeming rule may also create incentives for households to structure their portfolios in particular ways. Because financial assets are

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[12]See Centrelink (http://www.centrelink.gov.au/internet/internet.nsf/factors/assets_assessable.htm) for a comprehensive list of all assessed assets under the assets test.

[13]Estimated as the basic fortnightly pension rate divided by $0.003 plus the asset limit to qualify for full pension. See Australian Government (2010) for further details regarding relevant pension rates, asset value limits, and effective taper rates.

[14]The value of each partner assessable assets is taken to be 50 percent of the total net value of all eligible assets shared by the couple.

[15]See section 6.1.1 of Australian Government (2010) for detailed information on the provisions, causes and types of income and assets reviews.

deemed to earn a specific, relatively low, rate of return, households may direct their financial wealth toward riskier financial assets that are expected to earn returns above the deemed rate rather than safer assets with returns lower than the deemed rate. Thus, we expect that the riskiness of households' financial assets may be increased by the deeming rules; however, it is less clear how these deeming rules affect the incentives to hold financial wealth overall.[16] Households attempting to qualify for the age pension under the income test may also have an incentive to shift their investments away from financial assets and toward lifestyle assets (e.g. cars, recreational vehicles, holiday homes) that do not generate additional income.

Perhaps even more importantly, many Australian retirees have the ability to take their employer-provided pensions as lump sums, rather than as income streams, which exacerbates the influence of means testing the age pension (Atkinson *et al.*, 1995). This leads to 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 publicly-provided age pension.

Finally, Australian age pensioners are eligible to receive subsidies for health care or pharmaceuticals. As a result, the incentives to reallocate assets in order to qualify for the age pension may be particularly strong for those in poor health.

Thus far, the evidence on the extent to which Australian households act on these incentives remains inconclusive. Atkinson *et al.* (1999), for example, 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 modeling exercise demonstrates that the age pension means test generates strong incentives for Australians to restructure their 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 for Australian households to not only accumulate wealth generally, but also to allocate wealth toward some and away from other assets. In what follows, we compare the asset portfolios of equally wealthy households in the decades immediately before and immediately after reaching pensionable age. This allows us to abstract from the effect of means testing on savings levels and to concentrate on households' asset allocation. Our interest is in assessing whether or not the variation in asset portfolios across age and health status is consistent with the incentives inherent in the income and asset tests underpinning the age pension.

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[16]Unfortunately, our data are not detailed enough to permit us to examine the riskiness of households' financial assets.

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. HILDA data provide the only microlevel, longitudinal data on household wealth holding in Australia (see Wooden *et al.*, 2002; Heady *et al.*, 2005; Watson, 2009). Our analysis relies primarily on 2006 (wave 6) data. 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, group households, and related-family households. We have also 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 and 74 years of age. These restrictions result in a primary analysis sample of 867 couple-headed households and 602 single-headed households in 2006.[17]

Most of HILDA's wealth components are collected at the household level.[18] In this paper, we consider the way that 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 2006 income and asset tests underpinning the Australian age pension. Specifically, we focus on the following: net financial wealth, net business equity, net equity in one's own home, lifestyle assets, and the total value of pension assets.[19] 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). Net home equity captures households' equity (net value) in their principal residences. Net business equity includes the net value of all business shares owned by all household members. Lifestyle 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 estate (such as holiday homes and other properties) owned by household members.[20] 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

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

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

[19]Pension wealth is measured by the value of all mandatory and voluntary contributions by employers into pension funds or retirement saving accounts as well as all individual contributions into voluntary pension accounts. Voluntary contributions into individual pension accounts often benefit from generous tax treatment and operate similarly to Individual Retirement Accounts (IRA) in the U.S. or Registered Retirement Savings Plans (RRSP) in Canada.

[20]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.

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 sub-populations. 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 sub-population includes all households in which the reference person is between 65 and 74 years of age. 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. The sample means (and standard deviations) for the relevant demographic characteristics and place of residence are reported in Table 1

TABLE 1

DESCRIPTIVE STATISITCS BY AGE GROUP AND HOUSEHOLD TYPE

	Couples				Singles			
	55–64	S.D.	65–74	S.D.	55–64	S.D.	65–74	S.D.
Demographics								
Age	59.34	2.80	69.13	2.77	59.52	2.78	69.33	2.92
Spouse age	54.94	5.12	64.47	5.27				
Education	11.75	2.49	11.02	2.77	11.14	2.63	10.88	2.51
Spouse education	11.64	2.45	10.82	2.49				
Female	0.22	0.41	0.20	0.40	0.62	0.49	0.67	0.47
Never married					0.16	0.36	0.10	0.30
Widowed					0.25	0.43	0.55	0.50
Divorced					0.60	0.49	0.35	0.48
Homeowners	0.91	0.29	0.91	0.29	0.69	0.46	0.73	0.45
Health and retirement								
Retired	0.32	0.47	0.80	0.40	0.40	0.49	0.87	0.34
Spouse retired	0.26	0.44	0.75	0.43				
Both retired	0.17	0.37	0.67	0.47				
Poor health	0.27	0.44	0.33	0.47	0.32	0.47	0.35	0.48
Spouse poor health	0.19	0.40	0.24	0.43				
Place of residence								
New South Wales	0.32	0.47	0.38	0.48	0.32	0.47	0.33	0.47
Victoria	0.26	0.44	0.24	0.43	0.28	0.45	0.22	0.42
Queensland	0.19	0.39	0.16	0.36	0.18	0.39	0.22	0.41
South Australia	0.07	0.26	0.09	0.29	0.09	0.29	0.08	0.27
Western Australia	0.12	0.33	0.11	0.32	0.10	0.30	0.12	0.33
Tasmania	0.02	0.14	0.01	0.12	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	0.11	0.01	0.07	0.01	0.08
N	511		356		336		266	

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

for both couple- and single-headed households. 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 of couples both partners nonetheless reported being retired in 2006. In contrast, approximately 40 percent of single-headed households in this younger age group report having already left the labor force. Not surprisingly, the proportion of retirees rises substantially after the age of 64. At least 80 percent of all couple-headed households in this age range report at least one household member being retired, while up to 87 percent of single individuals between 65 and 74 years of age are no longer in the labor force.

3.2. *Health Status, Age, and Wealth*

Individuals in poor health may have particularly strong incentives to reallo-cate their assets in order to recieve the health care and pharmaceutical benefits available to age pensioners. We examine this issue by assessing the link between asset portfolios and a self-assessed measure of 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.

Table 1 shows 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 percent of married heads of household aged 55–64 report being in poor health in comparison to 33 percent of married household heads in the 65–74 age group. These differences in self-reported health status across age groups are not statistically significant.[21]

Table 2 presents 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.[22] 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 U.S. studies that demonstrate the close link between health and wealth (Smith, 1999; Hurd and Kapteyn, 2003; Michaud and van Soest, 2008). Households in good health are, not surprisingly, also less likely to have income or wealth levels that would lead them to qualify for the age pension once they reach pensionable age. While approxi-mately half of couples in good health would meet the income (50.8 percent) or asset test (57.8 percent), this is true of closer to 75 percent of couples in which at least one partner is in poor or fair health. Those who have income and wealth well below the relevant threshold have little incentive to adjust their assets in order to

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[21]Test results are not reported but are available upon request.
[22]These differences across health status are both economically meaningful and statistically significant.

TABLE 2
WEALTH HOLDING BY SUBJECTIVE HEALTH STATUS AND HOUSEHOLD TYPE

	Couples				Singles			
	Poor/Fair	S.D.	Good	S.D.	Poor/Fair	S.D.	Good	S.D.
Net wealth								
Mean total net wealth	761,878	885,893	1,124,719	940,733	336,520	455,053	607,618	727,055
Median total net wealth	498,280	199,350	837,482	266,700	223,153	194,680	379,919	239,600
Mean asset portfolio								
Total financial wealth	113,203	326,342	169,881	357,838	61,685	179,552	123,648	263,716
Interest-earning assets (banks)	46,307	93,293	52,270	105,198	20,366	50,582	36,759	86,222
Interest-earning assets (other)	1,395	10,399	3,725	48,572	2,694	17,667	3,339	24,550
Equity in stocks	65,378	291,329	112,447	312,259	35,487	148,659	80,972	212,972
Other assets	6,479	31,641	16,328	98,404	5,761	56,845	8,267	40,187
Unsecured debts	6,356	17,634	14,889	64,816	2,622	7,206	5,689	24,760
Business	17,374	98,928	49,640	217,258	352	4,061	16,506	96,686
Own home	346,320	307,547	434,013	307,410	182,411	205,847	283,087	306,547
Total lifestyle	122,772	309,191	172,453	345,876	42,581	133,313	77,498	239,989
Other real estate	96,585	287,072	139,288	337,827	32,276	129,564	61,895	232,505
Vehicles	26,187	48,339	33,166	45,230	10,305	13,441	15,603	22,197
Pension wealth	162,209	293,031	298,732	386,381	49,491	137,321	106,879	231,479
Proportion owning								
Financial wealth	1.000	0.000	0.995	0.068	0.978	0.148	0.987	0.114
Business	0.077	0.267	0.164	0.371	0.016	0.124	0.067	0.251
Own home	0.864	0.343	0.932	0.251	0.610	0.489	0.752	0.433
Lifestyle	0.967	0.180	0.994	0.078	0.792	0.407	0.882	0.323
Pension wealth	0.685	0.465	0.863	0.344	0.404	0.492	0.621	0.486
Share of households								
Under eligibility threshold								
Income test	0.750	0.434	0.508	0.500	0.878	0.329	0.700	0.459
Assets test	0.759	0.428	0.578	0.494	0.862	0.346	0.702	0.458
In eligibility range								
Income test	0.066	0.249	0.107	0.309	0.015	0.123	0.067	0.249
Assets test	0.066	0.249	0.062	0.241	0.010	0.101	0.044	0.206
Current income	57,265	64,474	83,684	67,909	23,548	30,987	41,007	55,626
N	332		535		196		406	

Notes: Own calculation based on wave 6 of HILDA data. Poor/fair health status if at least one partner rated his health as poor or fair. A household falls within eligibility range when its assessable income or assets is ±10% of its relevant threshold to qualify for a part pension (see Section 2 for further details on eligibility thresholds). All figures are reported in constant 2006 Australian dollars.

meet the income and asset tests. Asset reallocation is much more likely among those who are relatively close to the eligibility margin. At most 10.7 percent of households are within ±10 percent of the relevant income or asset threshold. Moreover, households in good health are more likely than those in poor or fair health to be in the eligibility range, suggesting that poor health is typically associated with having income and wealth levels well below the relevant thresholds in the age pension means tests.

Descriptive statistics on household net worth, asset portfolios, and income are presented for couple- and single-headed households separately by age group in Table 3. Households in which the reference person is aged 55–64 have higher mean (and median) wealth than households in which the reference person is between the ages of 65 and 74. This is consistent with households financing some of their post-retirement consumption by drawing down their savings. Single individuals aged 55–64 have more equity in all asset categories than do their older counterparts.[23] Older couples, on the other hand, have higher levels of financial wealth and home equity than do younger couples. Their lower levels of business equity, lifestyle assets, and pension benefits imply, however, that overall older couples are less wealthy than are younger couples. Older households are more likely than their younger counterparts to have income and wealth levels that would qualify them for the income or asset tests. At the same time, it is younger households that are much more likely to be within ±10 percent of the means test thresholds, suggesting that their incentives to reallocate assets in order to qualify for the age pension may in fact be stronger than are those of older households.

4. Regression Results: The Determinants of Asset Portfolios

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.

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:

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[23]The exception is that singles aged 65–74 hold slightly more wealth in the form of other assets.

TABLE 3
WEALTH HOLDING BY AGE GROUP AND HOUSEHOLD TYPE

	Couples					Singles				
	55–64	S.D.	65–74	S.D.	55–64	S.D.	65–74	S.D.		
Net wealth										
Mean total net wealth	1,026,318	930,768	911,846	939,738	584,648	753,879	432,331	507,972		
Median total net wealth	755,250	256,955	647,800	259,527	339,925	247,200	313,775	194,750		
Mean asset portfolio										
Total financial wealth	120,593	284,004	184,631	416,800	108,532	265,658	96,441	204,636		
Interest-earning assets (banks)	44,198	78,730	57,907	124,818	32,236	89,585	30,244	55,785		
Interest-earning assets (other)	1,825	34,063	4,154	43,279	3,923	27,526	2,090	13,387		
Equity in stocks	74,824	232,509	120,015	383,242	72,412	213,282	57,695	168,921		
Other assets	15,233	95,934	8,319	44,349	6,962	49,778	8,071	41,402		
Unsecured debts	15,486	56,996	5,763	41,982	7,000	26,982	1,658	5,249		
Business	49,530	205,701	18,482	133,638	16,449	101,385	4,352	33,617		
Own home	393,808	304,463	405,807	318,631	260,537	325,014	236,260	211,160		
Total lifestyle	176,139	339,666	119,021	319,151	79,137	200,783	48,932	223,894		
Other real estate	141,971	326,038	94,047	306,831	62,099	197,479	39,208	213,709		
Vehicles	34,169	49,616	24,974	41,443	17,038	22,171	9,723	15,565		
Pension wealth	286,247	381,804	183,906	312,122	119,994	237,464	46,347	149,230		
Proportion owning										
Financial Wealth	0.997	0.056	0.998	0.048	0.980	0.140	0.989	0.105		
Business	0.179	0.384	0.059	0.235	0.067	0.250	0.029	0.168		
Own home	0.904	0.295	0.907	0.291	0.687	0.465	0.729	0.445		
Lifestyle	0.985	0.122	0.980	0.139	0.866	0.341	0.834	0.373		
Pension wealth	0.908	0.289	0.627	0.484	0.696	0.461	0.360	0.481		
Share of households										
Under eligibility threshold										
Income test	0.483	0.500	0.796	0.404	0.671	0.471	0.884	0.321		
Assets test	0.609	0.489	0.720	0.450	0.705	0.457	0.830	0.377		
In eligibility range										
Income test	0.122	0.328	0.058	0.234	0.057	0.233	0.031	0.174		
Assets test	0.085	0.279	0.057	0.232	0.032	0.177	0.026	0.159		
Current income	90,259	77,347	48,739	40,269	42,133	58,974	26,325	31,530		
N	511		356		336		266			

Notes: Own calculation based on wave 6 of HILDA data. A household falls within eligibility range when its assessable income or assets is ±10% of its relevant threshold to qualify for a part pension (see Section 2 for further details on eligibility thresholds). All figures are reported in constant 2006 Australian dollars.

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

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, lifestyle assets, and pension funds. The vector Y_i includes both total family gross income and an indicator variable capturing whether household income is within the range of being eligible to receive the age pension.[24] Moreover, X_i is a vector which includes a measure of poor health as well as other demographic characteristics reflecting a household's lifecycle 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 household heads (and their partners) 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.[25]

We consider two model specifications: (1) our baseline model as described above; and (2) an 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 4 to 7 and are discussed in detail below.[26] In Section 4.2, we consider additional longitudinal evidence on changes in asset portfolios over the period 2002 to 2006.

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

[24]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.

[25]Specifically, we require that the estimated marginal effect of an additional dollar of wealth sums 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.

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

effect, our results on asset composition are calculated for households with average levels of wealth.

4.1. *Education, Gender, and Marital History*

Table 4 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.

Gender and previous marital history appear to be more important in under-standing the portfolios of single-headed households (see Table 5). For example, single women allocate approximately $185,000 more wealth than comparable single men to their homes, while holding almost $149,000 less financial wealth and around $52,000 less in lifestyle assets. Single women also hold somewhat fewer business assets. Moreover, those who are divorced hold more than $178,000 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) in lifestyle assets. Finally, consistent with our results for couples, educational attainment is unrelated to the way in which single individuals hold their assets.

4.2. *Income and Income Eligibility*

We turn now to consider the effects of income. Our baseline specification accounts for both the linear effect of total family gross income as well as any additional effect of having an income level within ± 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 4 and 5). In addition, couples allocate more wealth to lifestyle assets. For example, each additional dollar of income is associated with couples holding $11.79 less housing wealth, $6.61 more pension wealth, $2.61 more financial assets, $2.32 lifestyle assets, and $0.24 more business assets.[27] Single individuals reallocate their wealth in much the same way as their income grows, though the magnitude of these effects is smaller.

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[27]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.

TABLE 4

(AVERAGE) DETERMINANTS OF ASSET PORTFOLIOS: COUPLE-HEADED HOUSEHOLDS (MARGINAL EFFECTS AND t-STATISTICS), WAVE 6

	Financial Wealth		Business Assets		Own Home		Lifestyle		Pension Wealth	
	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	−145,136.03	−1.15	13,998.26	0.61	−4,975.75	−0.04	31,446.78	0.88	104,666.74	1.28
Demographics										
Age	39,629.02	2.62	−3,335.78	−1.67	−10,507.50	−0.58	−4,150.97	−0.89	−21,634.77	−1.62
Education	−9,355.70	−0.48	431.23	0.21	4,265.03	0.21	−6,955.13	−0.13	11,614.57	0.80
Head eligible for AP	68,111.98	0.45	4,500.38	0.22	−83,066.40	−0.52	−9,821.39	−0.18	20,275.44	0.15
Spouse eligible for AP	235,652.70	2.23	−12,785.71	−0.95	158,141.61	1.16	47,288.00	0.96	−428,296.62	−2.86
Female head	−37,389.86	−0.41	−11,100.19	−0.89	93,173.52	0.94	31,026.96	1.09	−75,710.45	−0.99
Previoulsy married	−81,627.87	−0.97	8,310.91	0.63	7,718.57	0.09	3,487.63	0.13	62,110.78	0.78
Poor health	−24,006.09	−0.32	−19,663.02	−1.77	163,969.06	2.10	−48,306.20	−1.89	−71,993.75	−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	

Notes: 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 5

(AVERAGE) DETERMINANTS OF ASSET PORTFOLIOS: SINGLE-HEADED HOUSEHOLDS (MARGINAL EFFECTS AND t-STATISTICS), WAVE 6

	Financial Wealth		Business Assets		Own Home		Lifestyle		Pension Wealth	
	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	378,135.53	3.71	11,933.07	1.05	−437,155.09	−3.65	53,481.86	1.79	−6,395.36	−0.08
Demographics										
Age	34,673.14	2.28	−109.39	−0.30	−3,981.05	−0.25	−6,256.18	−1.79	−24,326.52	−3.38
Education	14,711.75	1.15	29.43	0.06	−19,540.25	−1.37	4,847.75	1.19	−48.67	−0.01
Eligible for AP	−155,910.78	−1.03	−1,007.10	−0.24	197,115.25	1.36	−27,737.38	−0.72	−12,459.99	−0.16
Divorced	−178,886.25	−2.31	2,094.16	0.82	97,903.62	1.20	27,126.40	1.15	51,762.07	1.08
Never married	55,325.46	0.51	−2,536.11	−0.77	14,439.38	0.11	−62,988.01	−1.84	−4,240.72	−0.06
Female	−149,124.44	−1.85	−6,317.75	−1.93	185,152.72	2.15	−51,796.62	−2.44	22,086.10	0.52
Poor health	52,927.32	0.69	−3,561.91	−1.76	48,410.76	0.58	−21,678.88	−0.90	−76,097.30	−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.

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) and more in both financial wealth (approximately $378,000) and lifestyle assets (approximately $53,000). This small increase in lifestyle assets is consistent with the incentives inherent in the age-pension means test, though the sharp drop in house equity is not. The implications of this are difficult to interpret, however, given that income eligibility, unlike age eligibility (see below), is endogenous.

4.3. *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). 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) has reached the relevant pension age.[28]

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) and less pension wealth (approximately $22,000) (see Table 4). 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 5). 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) and less pension wealth (approximately $428,000) 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

[28]Accounting for aging through a cubic and a 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.

differences in the housing equity or lifestyle 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 lifestyle 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.

4.4. *Net Worth*

In assessing the potential link between eligibility criteria and asset portolios, it is very important to compare households that are equally wealthy. Consequently, our baseline specification includes a control for overall wealth (i.e., net worth), while our joint, constrained estimation strategy ensures that equity across all asset types sums to total net worth (see Blau and Graham, 1990). Our results highlight the differences in the way that couples and singles allocate an additional dollar of wealth across their various asset holdings. For couples, each additional dollar of wealth is associated with an increase in home equity ($0.53), lifestyle assets ($0.72), and pension wealth ($0.12) and a reduction in financial wealth ($0.37) (see Table 4). For singles, each additional dollar of wealth is associated with a reduction in financial wealth ($0.51) and an increase in home equity ($0.49) of the same proportion, leaving the additional wealth to be allocated to lifestyle ($0.86) and pension ($0.16) assets.

4.5. *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 and t-statistics) from our second specification which allows for this interaction are presented in Tables 6 (couples) and 7 (singles). We compare these results to those from our baseline model (see Tables 4 and 5).

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 more equity in their homes and almost $49,000 less in lifestyle assets than similar couples with equal net worth in which both partners are in good health (see Table 4). 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 5).

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.[29] This exercise

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[29]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.

TABLE 6

(AVERAGE) DETERMINANTS OF ASSET PORTFOLIOS: COUPLE-HEADED HOUSEHOLDS (MARGINAL EFFECTS AND t-STATISTICS), WAVE 6

	Financial Wealth		Business Assets		Own Home		Lifestyle		Pension Wealth	
	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
AP means test eligibility range										
Income test	−141,331.58	−1.12	13,839.41	0.61	−13,456.91	−0.11	32,163.31	0.90	108,785.77	1.33
Demographics										
Age	37,656.17	2.49	−3,253.62	−1.64	−8,324.15	−0.46	−4,496.14	−0.96	−21,582.26	−1.61
Education	−7,344.30	−0.38	317.42	0.16	2,594.21	0.13	−6,722.90	−1.08	11,155.56	0.77
Head eligible for AP	−168,475.19	−1.04	17,030.52	0.66	169,032.50	1.01	−44,949.96	−0.67	27,362.13	0.18
Spouse eligible for AP	453,493.22	3.30	−22,320.67	−1.05	−162,750.97	−1.03	86,936.36	1.50	−355,357.91	−2.06
Female head	−33,414.71	−0.37	−11,287.40	−0.91	88,662.33	0.91	31,567.04	1.10	−75,527.25	−0.99
Previously married	−80,140.34	−0.95	8,247.01	0.62	4,541.50	0.05	3,843.26	0.14	63,508.56	0.79
Poor health	−146,297.64	−1.22	−11,597.51	−0.67	229,720.64	2.08	−60,688.36	−1.75	−11,137.15	−0.13
Elig. × poor health	590,740.94	2.82	−31,582.39	−1.24	−622,003.56	−2.61	87,126.63	0.99	−24,281.66	−0.11
Spouse elig. × poor health	−473,621.78	−2.35	20,658.08	0.90	704,226.25	2.84	−86,233.26	−0.92	−165,029.33	−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	
R²	0.07		0.07		0.26		0.19		0.36	

Notes: Eligible for 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 7

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

	Financial Wealth		Business Assets		Own Home		Lifestyle		Pension Wealth	
	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	383,312.06	3.92	11,885.50	1.04	−441,710.00	−3.77	53,527.20	1.79	−7,014.76	−0.09
Demographics										
Age	34,431.27	2.32	−106.43	−0.29	−3,810.37	−0.24	−6,258.96	−1.78	−24,255.51	−3.35
Education	13,471.00	1.07	44.00	0.09	−18,496.23	−1.31	4,872.95	1.20	108.28	0.01
Eligible for AP	−19,389.14	−0.12	−2,455.92	−0.49	81,550.64	0.54	−28,404.18	−0.66	−31,301.39	−0.39
Divorced	−180,069.22	−2.33	2,100.05	0.82	99,228.78	1.21	27,090.13	1.14	51,650.26	1.07
Never married	55,356.40	0.51	−2,540.05	−0.77	14,543.77	0.12	−62,955.89	−1.84	−4,404.22	−0.07
Female	−161,596.08	−2.06	−6,187.17	−1.88	195,830.06	2.30	−51,723.57	−2.42	23,676.75	0.55
Poor health	257,652.02	2.25	−5,728.56	−1.89	−125,320.01	−1.04	−22,739.51	−0.70	−103,863.94	−1.64
Elig. × poor health	−389,720.16	−2.77	4,116.17	1.10	330,662.91	2.17	1,926.34	0.04	53,014.71	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.

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.[30]

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 6). As discussed above (see Section 4.3) 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.

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 more equity in their homes and approximately $61,000 less in lifestyle 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 more 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 to reshape assets in order to quality for the Australian age pension, this appears to be concentrated among single-headed households.

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

4.6. *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 lifestyle 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 heads (and their partners) 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.

5. Difference-in-Difference: Changes in Wealth and Asset Portfolios over Time

Data on household wealth and assets were also collected in HILDA in 2002 (wave 2). Consequently, we have information for a limited number of households that reported wealth data in both waves 2 and 6 and did not change household type in the interim.[31] Our sample sizes are too small to permit the simultaneous estimation of a 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 there are significant differences over this period in the asset accumulation (or deccumulation) of households that did and did not become age eligible for the age pension. This exercise is useful in providing a robustness check on our previous conclusions.

Table 8 presents the average change in net worth and asset levels between 2002 and 2006 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

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

TABLE 8

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	127,333	180,946	0.314	133,259	81,921	0.264
Financial wealth	24,222	20,772	0.941	37,086	−7,841	0.047
Business	−21,745	−12,782	0.649	−10,082	972	0.552
Own home	65,846	95,090	0.426	64,153	56,289	0.554
Lifestyle	33,567	35,645	0.942	39,115	11,263	0.508
Pension wealth	25,443	42,220	0.513	2,986	21,238	0.301
N	120	419		75	269	

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

the table). The wealth of couples reaching pension age changed in substantially the same way as that of couples who did not reach pensionable age over the period. 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. This change is not consistent with the incentives inherent in the age pension means test. Specifically, financial wealth is deemed to have earned a specific rate of return in calculating assessable income under the income test, giving households an incentive to reduce rather than increase financial wealth.

Taken together, these longitudinal comparisons corroborate the main findings from our cross-sectional analysis of 2006 HILDA data. The variation in 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.

6. 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; however, it 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 to 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 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 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 appears to be predominately concentrated among single pensioners who are in poor health.

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 *et al.*, 1995; Barrett and Tseng, 2008; Cho and Sane, 2009); however, given the international literature it seems sensible to expect some effect on Australian savings levels as well.

References

Atkinson, M., J. Creedy, and D. M. Knox, "Planing Retirement Income In Australia: Routes through the Maze," *Australian Economic Review*, 28(4), 15–28, 1995.
———, "Alternative Retirement Income Arrangements and Lifetime Income Inequality: Lessons from Australia," *International Tax and Public Finance*, 6, 103–17, 1999.
Attanasio, O. P. and A. Brugiavini, "Social Security and Households' Saving," *Quarterly Journal of Economics*, 118, 1075–119, 2003.
Australian Bureau of Statistics, "Population by Age and Sex, Australian States and Territories," Technical Report, ABS, 2008.
Australian Government, "Guide to Social Security Law," Version 1.166, http://www.fahcsia.gov.au/guides_acts/ssg/ssg-rn.html, 2010.
Barrett, G. and Y. P. Tseng, "Retirement Saving in Australia," *Canadian Public Policy*, 34, 177–93, 2008.
Bateman, H. and J. Ablett, "Compulsory Superannuation and Australian Generational Accounts," *Economic & Analysis Policy*, 30(1), 33–48, 2000.
Beetsma, R., L. Bettendorf, and P. Broer, "The Budgeting and Economic Consequences of Ageing in The Netherlands," CESifo Working Paper 630, Center for Economic Studies and Ifo Institute for Economic Research, 2001.
Bingley, P., N. D. Gupta, and P. J. Pedersen, "The Effects of Pension Programme Incentives on Retirement Behaviour in Denmark," Working Paper 01-03, Centre for Labour Market and Social Research, 2002.
Blau, D., "Retirement and Consumption in a Life Cycle Model," *Journal of Labor Economics*, 26(1), 35–71, 2008.
Blau, F. D. and J. W. Graham, "Black–White Differences in Wealth and Asset Composition," *Quarterly Journal of Economics*, 105, 321–39, 1990.
Bonin, H., J. Gil, and C. Patxot, "Beyond the Toledo Agreement: The Intergenerational Impact of the Spanish Pension Reform," *Spanish Economic Review*, 3, 111–30, 2001.
Börsch-Supan, A., "The Impact of Population Aging on Savings, Investment and Growth in the OECD Area," in *Future Global Capital Shortages: Real Threat or Pure Fiction?* OECD, Paris, 103–41, 1996.

Börsch-Supan, A. and A. Reil-Held, "Retirement Income Level, Risk and Substitution among Income Components," Ageing Working Paper No. 3.7, OECD, Paris, 1998.

Cho, S.-W. and R. Sane, "Means-Tested Age Pension and Homeownership: Is There a Link?" Working Paper, University of New South Wales, 2009.

Cobb-Clark, D. A. and V. A. Hildebrand, "The Wealth and Asset Holdings of U.S.-Born and Foreign-Born Households: Evidence from SIPP Data," *Review of Income and Wealth*, 52, 17–42, 2006.

Cobb-Clark, D. A. and S. Stillman, "The Retirement Expectations of Middle-Aged Individuals," IZA Discussion Paper 2449, 2009.

Disney, R., "Crises in Public Pension Programmes in OECD: What Are the Reform Options?" *Economic Journal*, 110, F1–23, 2000.

Geyer, J. and V. Steiner, "Public Pensions, Changing Employment Patterns, and the Impact of Pension Reforms across Birth Cohorts: A Microsimulation Analysis for Germany," Discussion Paper 4810, IZA, 2010.

Greene, W. H., *Econometric Analysis*, 3rd edition, Prentice Hall, Upper Saddle River, NJ, 1997.

Gruber, J. D. W., "An International Perspective on Policies for an Aging Society," Working Paper 8103, NBER, 2001.

Harmer, J., "Pension Review Report," Technical Report, Department of Families, Housing, Community Services and Indigenous Affairs, 2009.

Heady, B., "Income and Wealth-Facilitating Multiple Approaches to Measurement and Permitting Different Levels of Aggregation," Technical Report, HILDA Project Discussion Paper Series, 3/03, 2003.

Heady, B., G. Marks, and M. Wooden, "The Structure and Distribution of Household Wealth in Australia," *Australian Economic Review*, 38, 159–75, 2005.

Hurd, M. D. and A. Kapteyn, "Health, Wealth, and the Role of Institutions," *Journal of Human Resources*, XXXVIII, 386–415, 2003.

Hurd, M., P.-C. Michaud, and S. Rohwedder, "The Displacement Effect of Public Pensions on the Accumulation of Financial Assets," Working Paper 2009-212, Michigan Retirement Research Center, 2009.

Jefferson, T. and A. Preston, "Australia 'Other' Gender Wage Gap: Baby Boomers and Other Compulsory Superannuation Accounts," *Feminist Economics*, 11(2), 79–101, 2005.

Jiménez-Martín, S. and A. R. Sánchez Martín, "An Evaluation of the Life Cycle Effects of Minimum Pensions on Retirement Behavior," *Journal of Applied Econometrics*, 22, 923–50, 2007.

Knox, D. M., "The Age Pension: Means Tested or Universal?" *Australian Economic Review*, 28, 107–10, 1995.

Mantovani, D., F. Papadopoulos, H. Sutherland, and P. Tsakloglou, "Pension Incomes in the European Union: Policy Reform Strategies in Comparative Perspective," Discussion Paper 1537, IZA, 2005.

Michaud, P.-C. and A. van Soest, "Health and Wealth of Elderly Couples: Causality Tests using Dynamic Panel Data Models," *Journal of Health Economics*, 27, 1312–25, 2008.

Preston, A. and S. Austen, "Women, Superannuation and the SGC," *Australian Bulletin of Labour*, 27, 272–95, 2001.

Sánchez Martín, A. R., "Endogenous Retirement and Public Pension System Reform in Spain," Working Paper 08.06, Universidad Pablo Olavide de Sevilla, 2008.

Sefton, J. and J. van de Ven, "Optimal Design of Means Tested Retirement Benefits," *Economic Journal*, 119, F461–81, 2009.

Sefton, J., J. van de Ven, and M. Weale, "Means Testing Retirement Benefits: Fostering Equity or Discouraging Savings?" *Economic Journal*, 118, 556–90, 2008.

Smith, J. P., "Healthy Bodies and Thick Wallets: The Dual Relation Between Health and Economic Status," *Journal of Economic Perspectives*, 13, 145–66, 1999.

Visco, I., "Ageing Populations: Economic Issues and Policy Challenges," in H. Siebert (ed.), *Economic Policy for Aging Societies*, Springer, Berlin. Heidelberg, 9–26, 2002.

Watson, N., "Hilda User Manual, Release 7," Technical Report, Melbourne Institute of Applied Economic and Social Research, University of Melbourne, 2009.

Whitehouse, E. R. and M. Queisser, *Pensions at a Glance: Public Policies Across OECD Countries*, Paris, OECD, 2007.

Williamson, J. B., "Privatizing Public Pension Systems: Lessons for the United States from Latin America," CRR WP 1999-03, Center for Retirement Research, 1999.

Willmore, L., "Three Pillars of Pensions? A Proposal to End Mandatory Contributions," DESA Discussion Paper Series 13, United Nations, 2000.

Wooden, M., S. Freidin, and N. Watson, "The Household, Income and Labour Dynamics in Australia (HILDA) Survey: Wave 1," *Australian Economic Review*, 35, 339–48, 2002.