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Financial Incentives Affecting the Retirement Decisions of Mature Age Australians

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Abstract

In Australia, labour force participation among older people, particularly men over the age of 55, has been declining over the last 30 years. Previous research has found that in many OECD countries, the retirement income system actually provides incentives for older workers to retire early rather than remain in the work force. We use data from the first five waves of the Household, Income and Labour Dynamics in Australia (HILDA) survey to identify any financial incentives present in the Australian retirement income system on retirement decisions of men and women aged between 54 and 64 in 2001. As the superannuation guarantee only came into effect in 1992, the majority of people in this age group would not have built up substantial superannuation savings, and most will rely at least partially on the age pension in retirement.

A unique feature of the HILDA data is that detailed information on wealth, superannuation and income support payments is provided. Following Gruber & Wise (2004), we model retirement behaviour where individuals retire in the period that the present value of their lifetime retirement income is maximised. We also utilise an augmented model that considers the trade-off between utility drawn from leisure and utility drawn from labour income. Our findings suggest that for men the Australian retirement system provides incentives to retire early, while for women financial incentives are less significant, as the factors that influence women's retirement behaviour are more commonly found to be family related, rather than financial incentives.

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1. Introduction

As in most OECD countries, the ageing population in Australia has given rise to concerns about whether, in the future, there will be enough people in the workforce to support the growing proportion of the population who have left the labour force. At the same time, a majority of Australian men and women retire before the statutory age for the pension. Combined with increased life expectancy, this means that the average number of years Australians are spending in retirement is increasing, and a high proportion of retirees will not have saved enough to be self-funding in retirement, so will have to rely on government pensions.

The main negative consequences of this upcoming policy problem are usually said to be a possible shortfall in public finances to cover the pension entitlements that people believe they should be entitled to and, more importantly, a potential drop in living standards due to the aging of the population and a consequent worsening retired person dependency (RPD) ratio.[1] Therefore, a key policy issue for the Australian Government is how to increase mature age participation. Understanding how retirement expectations are determined, as well as the incentives, or disincentives, that older people face when deciding whether or not to continue working has important implications for knowing the main determinants of future labour supply decisions for the mature age population.

In making the decision about when to retire, workers face two competing sets of incentives: the longer they remain in the labour force, the larger their retirement income will usually be when they do retire, but more years of work also mean fewer years of retirement. If the increase in annual retirement income due to postponement of retirement is not large enough to offset the shorter period of retirement income receipt, they have a financial incentive to exit the labour force.

In most countries, employees who are eligible to collect an old age pension face *positive* marginal tax rates if they choose to continue to work. In other words, when pensions forgone by continuing to work are taken into consideration, for many people the financial benefits from continuing to work are small, and if the increase in retirement income from working an extra year is not enough to offset pension income foregone, the pension system effectively imposes a tax on continuing to work.

The international comparative literature clearly shows that the higher a country's implicit taxes on continued work, the lower the actual average age of retirement (Duval, 2004; Gruber and Wise, 1999, 2004). The trend is linear except for spikes at the ages at which particular types of occupational and state pensions become available.

This paper models the financial incentives facing mature age Australians who are deciding whether to continue in paid work or to exit the labour force. The aim is to determine whether the current superannuation and age pension system in Australia actually makes older people financially better off if they stop working rather than continue in the labour force. The models that we have developed extend to Australia

[1] The retired dependency ratio defined as the ratio of persons retired to those actually working.

an influential line of research initiated by Stock and Wise (1990), Coile and Gruber (1999) and Gruber and Wise (1999, 2004). In Gruber and Wise (2004), models of this type have been developed for twelve industrialised countries, which in all cases have workforce conditions and particularly retirement income arrangements quite different from Australia's. In ten of the twelve countries there were disincentives against continued work, or, put the other way round, the retirement income system provided incentives to exit the labour force early.

To date analysis of this kind has not been conducted for Australia.[2] However, Australia is included in the main OECD studies and Australian economists have also undertaken analyses of the effective marginal tax rates faced by employees at different ages as they decide whether to continue working or retire (Woodland, 1987; Freebairn, Porter and Walsh, 1989; Atkinson, Creedy and Knox, 1995; Atkinson, Creedy and Knox, 1996; Atkinson and Creedy, 1996; Atkinson and Creedy, 1997; Bacon, 1999). Australia appears to be close to the OECD average in terms of the effective marginal tax rates on the incomes and savings of mature age people (Duval, 2004). It should be noted that the Australian literature is limited by dealing almost entirely with men, and until the advent of the Household, Income and Labour Dynamics in Australia (HILDA) Survey it was also limited by being based solely on cross-sectional rather than longitudinal research.

This paper is organized as follows; section two describes the Australian retirement income system and the key elements that are likely to either encourage or discourage early retirement, section three provides information about the HILDA Survey data that is used in this study, section four describes the construction of the financial incentive measures. Section five contains the results from estimating binary response models of retirement including these incentive measures, and section six uses these models to simulate the effects of policy changes on the probability of leaving the labour force. Section seven concludes.

2. Australia's Retirement Income System

The Australian retirement income system is made up of three elements, which have become known as the three pillars. Firstly, a publicly funded means tested age pension; second, the mandatory private superannuation system, and third, voluntary saving, including voluntary superannuation and other long term saving through property, shares and managed funds. The Australian government provides incentives such as the deferred pension bonus plan and the senior Australians' tax offset to encourage older workers to remain in the labour force and, from 1 July 2007, will abolish taxes on superannuation benefits for those who are aged 60 or over at the time they claim their superannuation benefits.

The Age Pension

The age pension was introduced in 1908 and since that time has served as the social welfare safety net for the elderly, providing a modest benefit on the basis of need. The

[2] Felmingham et. al. (2006) have used the HILDA Survey data to calculate implicit tax rates for people aged between 49 and 69, and found that for people aged 60 and over, the implicit tax rate on continuing to work is positive, but did not examine the impact of these taxes on labour force participation or do separate calculations for men and women.

Australian Government has legislated to maintain the single rate age pension at a minimum of 25% of male average earnings and, as retirees solely reliant on the age pension pay no income tax, this translates to a net of tax replacement rate of 37% (Bateman and Piggot, 2001). The pension is payable to men aged 65 and over and women aged 62 and over, and is subject to means tests by which the amount of pension received is determined by a person's income or assets, whichever determines the lower rate of pension.[3] In 2002, around 82% of the population of age pension age received an age pension or similar payment and 67% of age pensioners were paid the maximum rate of pension (FaCS, 2002).

The Deferred Pension Bonus Plan

In July 1998, the deferred pension bonus plan was introduced. This scheme offered individuals reaching pension age a financial incentive to remain in the workforce. This scheme offers a once only, tax free, lump sum bonus to people who continue working instead of claiming an age pension or service pension. The amount of bonus depends on the amount of basic age pension the individual would be entitled to when they leave the workforce, the length of time they have been a member of the pension bonus scheme, and whether they are single or partnered during the time they are deferring the pension. A maximum of five years accruing membership can be taken into account for the bonus. The maximum amount of pension bonus payable, effective from March 2007, is $1283.30 for singles and $1071.70 for partnered people who defer retirement for one year and who would have been entitled to a full age pension, and increases to $32083.60 for singles and $26792.40 for partnered people who deferred their retirement for five years.

The Senior Australians' Tax Offset

The Senior Australian Tax (SATO) offset provides a further incentive for older people to continue working beyond age pension eligibility age. Introduced in July 2000, the SATO reduces the amount of tax payable by senior Australians who would be eligible for an age pension, but continue working. As of 1 July 2005, single people who meet the eligibility criteria for this tax offset can earn up to $21,968 per year ($36,494 for couples) before having to pay any income tax.

Disability Support Payment and other types of income support

There are several income support payments available to people who have not yet reached age pension eligibility age. The most commonly received income support payments for men and women over 55 but not yet eligible for the age pension are the disability support payment (DSP), unemployment benefits (NewStart Allowance and Mature age allowance) and service pension (a pension available to service men and women from the age of 60). These pensions are means tested and subject to particular eligibility requirements. A major policy concern in Australia, as in other OECD countries (OECD, 2002), is whether mature age people who cannot get a job or who no longer want to work stay on government benefits such as the disability support

[3] The eligibility age for women is being increased to age 65 by the year 2014. Details of the means tests for the age pension are provided in appendix Table A1.

payment (DSP) and NewStart until they become eligible for the age pension. The HILDA Survey data indicates that in 2003, the most common type of income support for men and women who consider themselves retired, but are still below age pension age was the Disability Support Pension.

Superannuation

Prior to the superannuation guarantee in 1992, superannuation coverage in Australia was low, and mainly limited to white collar workers. Tax concessions for voluntary superannuation contributions were first introduced in 1915 and strengthened in 1936, however the superannuation industry was largely unregulated and benefit standards were poor (Bateman and Piggot, 2001). Superannuation became more widely available in the 1970's through negotiation on its inclusion in industrial awards, but by 1974, only 32.2% of wage and salary earners (40.8% of male wage and salary earners and only 16.5% of females) were covered by superannuation (Treasury, 2001).

The 1986 National Wage Case provided for a minimum level of superannuation for employees covered by awards, when half of the negotiated 6% wage rise was to be paid in the form of a 3% employer superannuation contribution. This produced an immediate jump in superannuation coverage in the public sector to over 90 per cent (ABS, 1993). In the private sector, superannuation coverage increased progressively over the next four years, and, after the introduction of compulsory award-based superannuation in 1991, superannuation coverage increased to 79% of employees. In 1992, the government introduced the "superannuation guarantee", which requires employers to make superannuation contributions into an approved fund on behalf of their employees. Initially employer contributions were 4% of earnings, with progressive increases until the target of 9% was reached in July 2002. By June 2004, 90% of employees had some form of superannuation coverage in a superannuation system that included 10 million employees and 1.1 million employers (ATO, 2003).

The superannuation co-contribution scheme, an initiative to assist eligible individuals to save for their retirement, was first introduced in July 2003. Under this scheme, the government would match personal superannuation contributions, dollar for dollar, up to a maximum of $1000 for people whose annual income was less than $28000. The scheme was extended in 2004 to cover those with incomes of up to $58000, and the maximum co-contribution available was increased to $1500. In a further attempt to encourage labour force participation of older workers, from 1 July 2007, the 15% benefits tax on superannuation payouts will be removed for people who remain in the workforce until at least age 60. This tax cut will increase retirement incomes for those who retire after the age of 60, and encourage voluntary superannuation contributions.

Superannuation benefits may be accessed in the form of a lump sum or income stream upon reaching the preservation age, currently 55, increasing to 60 by 2025. There appears to be a strong preference for taking superannuation as a lump sum payment, even though income streams are treated more favourably by the age pension means test (Mitchell and Piggott, 2000).

3. Data

The data used for this paper come from the first five waves of the Household, Income and Labour Dynamics in Australia (HILDA) Survey. Described in more detail in Watson and Wooden (2002), the HILDA Survey began in 2001 with a large national probability sample of Australian households occupying private dwellings. The survey involved interviews with all household members over the age of 15 years. In the first wave, 7683 households representing 66 percent of all in-scope households were interviewed, generating a sample of 15,127 persons who were eligible for interviews, of whom 13,969 were successfully interviewed. Almost all of the wave 1 interviews were conducted during the period between 24 August 2001 and 21 December 2001. A crucial feature of the HILDA Survey data is the special wealth module which was included in 2002, in which detailed information was collected on individual and household level wealth (assets and debts), including superannuation holdings.

Compared with European and North American models, the data requirements for Australian modelling of the incentives to retire early are markedly different and are in fact substantially met by the HILDA Survey. For Australian research we need to know the value of individuals' superannuation and also the value of other household assets, because these are what determine retirement income. In 2002 the HILDA Survey collected superannuation and wealth data (and will do so again in 2006). In Europe and North America, by contrast, the data requirements for models include individual lifetime earnings profiles, since these are what determine final retirement income.[4] In Australia such earnings profiles are not needed, except for individuals in defined benefit schemes, and even for them the HILDA data about superannuation and wealth holdings in 2002 give us enough information to estimate future retirement income under different scenarios of continued work versus labour force exit.

Sample Selection

The sample used for modeling consists of men and women between 55 (the superannuation preservation age) and 70 years of age. We further restrict our sample to those in paid employment when the HILDA Survey began in 2001 and who had superannuation and household wealth data from wave 2 of the HILDA Survey. Given that all the men and women in the sample were employed in 2001, we only use their data from 2002 onwards in our regressions. Each of these individuals remains in the sample until they exit employment, leaving a total of 2318 observations from 589 individuals.[5]

[4] Note that the models for most overseas countries lack wealth data, which is quite a serious defect, given the importance of property and share holdings to many people's total income in retirement.

[5] Re-entry into the labour force for people aged 55 to 70 is relatively uncommon, with 8% of people aged between 55 and 70 who were employed in 2001 leaving the labour force and then re-entering during the period from 2002 to 2005.

4. Measures of Financial Incentives to Retire from the Labour Force

When deciding whether to continue working, mature age people would consider not only their current earnings from employment but also the effect of continued employment on future retirement income. So, in addition to human capital and demographic variables that are usually included in labour force participation models, analysis of the labour force participation decisions of the mature age population requires additional information about financial incentives to remain in work or to exit the labour force.

Mature age workers face two competing sets of incentives: the longer they remain in the labour force, the larger their retirement income will usually be when they do retire, but more years of work also mean fewer years of retirement. If the increase in annual retirement income due to postponement of retirement is not large enough to offset the shorter period of leisure, they have a financial incentive to exit the labour force ('retire early'). Hence, the main hypothesis is that, in each observed period, the probability of mature age people working will be influenced by the strength of financial incentives to do so.

The starting point for the calculations of financial incentives to retire rather than work is the concept of 'social security wealth' (SSW). In the Australian context, SSW can be thought of as the present value of expected total lifetime retirement income, which can be a combination of income from the old age pension, and/or from superannuation.[6] The key idea is that if the increase in retirement income due to postponement of retirement is not large enough to offset the shorter time of pension income receipt, then there is a financial incentive to retire earlier.

For a worker who is S years old and plans to retire at age R, SSW is defined as:

$$SSW_s(R) = \sum_{t=R}^{T} B(r)_t . \alpha_t . \delta^{t-S} \qquad (1)$$

Where S = age now.
R = retirement age.
$B(r)_t$ = net retirement income at age t (from pensions and superannuation)
T = age of certain death (here assumed to be 102)
α_t = probability of surviving until at least age t, given survival until age t-1.[7]
δ = discount factor.[8]

[6] The third component of retirement income, voluntary savings, is not included in the calculations of SSW, as our aim is to identify financial incentives that can be changed by government policy. Instead, household wealth is controlled for in the probit regressions.
[7] The conditional probabilities that are required for these calculations were derived from age and gender specific Australian Life Tables (ABS Catalogue 3302.0).
[8] A standard discount rate of 3% is used.

Financial incentive variables

For each individual we calculate three different incentive measures: the SSW accrual (Fields & Mitchell (1984), Haussman & Wise (1985), Suyoshi (1989)), the peak value (Coile and Gruber (1999)), and the option value (Stock and Wise (1990)).

SSW Accrual

Our first financial incentive measure compares potential lifetime retirement income if a person chooses to retire now with potential lifetime retirement income if the person chooses to continue to work for one more year. The difference between social security wealth if a person chooses to retire now and social security wealth if they continue working for one more year is referred to as the accrual in social security wealth.

$$\text{SSW Accrual} = SSW_t - SSW_{t-1} \qquad (2)$$

In order for the accrual measure to be positive, the increase in the future benefits due to postponement of retirement should offset the fact that the individual will receive the benefit for one less year. If the accrual is positive, there is a financial incentive to continue working. However, if social security wealth in one year's time is lower than social security wealth if the person retires now (i.e. a negative accrual), then there is a disincentive to remain in the labour force—the person gives up an extra year of retirement and their total expected social security wealth over the rest of their lifetime is less than if they had retired one year earlier.

As Gruber and Wise (2004) noted, it is natural to think of the accrual as positive, or at least not negative. That is, if a person works for another year and thus foregoes one year of retirement income, it might be expected that the flow of retirement income which began one year later would be large enough to offset the fact that receipt was postponed for a year. However, in most countries, once age pension eligibility age has been reached the social security accrual is *significantly negative* (Gruber and Wise, 2004).

Peak Value

SSW accrual only takes account of the immediate benefit of working one extra year versus retiring immediately. In practice we would expect mature age people to have longer time horizons. Peak value, suggested by Coile and Gruber (1999), is based on an assumption that individuals considering work versus retirement have a lifetime perspective, rather than basing their decision only on the year ahead.

The peak value is the difference between the maximum possible value of expected social security wealth and expected social security wealth if the person retires now.[9]

[9] It should also be noted that if SSW for an individual is maximum at time *t*, then the peak of the SSW process will be attained with immediate retirement, and the peak value will be exactly the same as the dollar accrual value. Also, beyond the optimal retirement age (after SSW has peaked) the peak value calculation also collapses to the one-year accrual measure.

The peak value can be defined by following equation:

$$Peak = \max(SSW_R) - SSW_t, R > t \qquad (3)$$

Investigating all possible future retirement ages allows us to identify non-linearities in the accrual profile, which would not be apparent when only one extra year of work is considered. For example, for a person who would be eligible for the deferred age pension bonus, a small negative accrual in year *t* could be followed by a small positive accrual in year *t+1,* and an even larger positive accrual in year *t+2*.

Option Value

So far, the financial incentive measures have only considered income once the individual has retired. An alternative measure, the option value (Stock and Wise (1990)) considers the labour-leisure tradeoff by incorporating utility of consumption into the analysis. The option value is based on the idea that individuals' decisions about when to retire may be based on a desire to maximise utility during their remaining lifetime. They are thought of as balancing the utility gained from leisure in retirement, coupled with a certain retirement income, against the disutility of working coupled with a certain labour income.

Following Stock and Wise (1990), utility of consumption is represented by an isoelastic utility function in after tax income, $u(Y) = Y^{\gamma}$, where γ is the degree of risk aversion. The utility gained from work, or, as a proxy, the utility assumed to be derived from labour income is given as:

$$U_W(W_S) = W_S^{\gamma} \qquad (4)$$

where W_S = labour income at age S

In order to capture the utility from leisure, retirement income is weighted by (κ>1) Hence, the indirect utility of retirement income is:

$$U_R(B(r)_S) = (\kappa B(r))_S^{\gamma} \qquad (5)$$

where $B(r)_S$ = retirement income at age S

Overall, the option value is the expected gain in utility from postponing retirement to the optimal retirement age, or, in other words, the option value is the maximum utility difference between retiring at any future age and retiring now. Option value can be expressed as:

$$OV_a = \max_h(V_h - V_a), \quad h = a + 1, ..., R \qquad (6)$$

where V_a is the total expected utility of retiring at age *a,* and

V_h is the total utility of retiring at age *h* (*h* > *a*)

The total expected utility of retiring at age *a* is defined as:

$$V_a = \sum_{t=a+1}^{T} \alpha_t \delta^{t-a} [\kappa B(r)_t]^{\gamma} \qquad (7)$$

and the utility drawn from retiring at a later age, *h,* is defined as:

$$V_h = \sum_{t=a+1}^{h} \alpha_t \delta^{t-a} W_t^{\gamma} + \sum_{t=h+1}^{T} \alpha_t \delta^{t-a} [\kappa B(r)_t]^{\gamma} \qquad (8)$$

where W_t = Expected annual retirement income at age *t*

$B(r)_t$ = expected after-tax wage at age *t*

α_t = probability of surviving at least until age *t* given survival until age *t-1*

δ = discount factor=1/(1+r) , r = 0.03

T = age of certain death (here assumed to be 102)

κ = parameter to account for the disutility of labour, and

γ = degree of risk aversion.[10]

Tables 1.1 and 1.2 summarise the values of the financial incentive variables described above for men and women between the ages of 55 and 70.

Table 1.1
Financial incentives to retire (medians), Men 55-70

Age	SSW_0 ($)	Accrual ($)	Peak Value ($)	Option Value
55	263816	5086	28466	77118
56	270645	4408	24622	70544
57	273369	4344	20038	61583
58	258774	4023	18980	59626
59	246856	2902	13190	47750
60	250549	2145	7681	37023
61	239014	2053	3821	27928
62	263663	1364	3296	25792
63	234848	1142	1142	19679
64	210030	682	682	19279
65	176005	-3425	-3425	15595
66	167289	-1748	-1060	13251
67	206388	-2577	-2577	12203
68	224066	-1248	-1248	9716
69	160506	-139	-139	5562
*70	144475	-5566	-5566	-80

* Fewer than 20 cases for men of this age.

[10] Following Blundell et al (2004), we set $\kappa = 1.25$ and $\gamma = 0.75$. Reasonable changes to these values, including setting $\kappa = 1.5$ and $\gamma = 1$, do not affect the significance of the option value variable in regressions.

The median level of social security wealth (if the person chooses to retire immediately) is generally higher for men who have not yet reached the age of 65 than for men aged 65 or older. Median social security wealth accrual decreases with age and becomes negative at age 65, indicating that, in terms of social security wealth, many men would be better off to retire at this age rather than continue working. The median levels of peak value and option value also decrease with age. From the age of 65 onward, peak value is negative, and the median peak value at ages from 63 onwards (with the exception of age 66) is equal to accrual, indicating that at least 50% of men at these ages would maximise their social security wealth by retiring either in one year's time (for men aged 63 and 64 where the peak value is positive) or immediately (men aged 65 and over).

Table 1.2
Financial incentives to retire (medians), Women 55-70

Age	SSW_0 ($)	Accrual ($)	Peak Value ($)	Option Value
55	202783	4307	19925	61602
56	209042	3617	16621	49695
57	218577	2959	10997	41827
58	218180	2797	8810	38933
59	238064	2288	5209	30910
60	233055	2876	3678	32853
61	242605	-1995	-1995	24037
62	238423	-2737	-2737	20204
63	240327	-1829	-1829	16437
64	231866	-1155	-1155	10361
65	213688	614	767	6547
66	217720	-6086	-6086	-614
* 67	206650	-6252	-6252	-1017
* 68	154735	-6513	-6513	674
* 69	62918	723	3649	9405
* 70	238860	-2180	-2180	1125

* Fewer than 20 cases for women of this age.

The median levels of social security wealth (and hence dollar accrual) are lower for women than for men. This is a result of the fact that women generally have lower superannuation balances than men do. As was the case for men, median SSW accrual becomes negative once women have reached age pension eligibility age. Peak value and option value were also lower for women, but showed the same pattern of decreasing with age.

5. Estimated Financial Incentives and the Probability of Retirement

In this section we present estimates of the impact of the financial incentive variables on retirement decisions by modeling the conditional probability of exit from employment. The probability of exiting labour force at time *t* for an individual *i* can be expressed as:

$$\Pr(R_{it} = 1) = \Phi(\beta' X_{it} + \delta I_{it}) \qquad (9)$$

Where R_{it} is 1 if the individual *i* has left the labour market in period *t*. X_{it} is a matrix of observed characteristics, I_{it} represents one of the financial incentive measures (i.e accrual, peak value or option value) and $\Phi()$ is the normal cumulative distribution function.

The key hypothesis to be tested is that the higher an individual's accrual, peak value, or option value due to continuation in paid work, rather than taking retirement, the less likely it will be that he or she retired from the workforce. So, a priori we expect negative coefficients for the effects of these financial incentive measures.

Our approach is to estimate probit regressions, pooling all five years of HILDA data (2001-2005), but excluding the cases for the first year as we have selected only people who were employed in that year. The explanatory variables included in the model are shown in Table 1.3.

Table 1.3
Variables Included in Multivariate Analyses – Men and Women Aged 55 to 70

		Men		*Women*	
		Mean	S.D.	Mean	S.D.
Accrual	Change in SSW if continue working for one extra year ($)	3673	5707	2189	4308
Peak value	Maximum possible increase in SSW if continue working ($'0000)	23649	42210	17170	27122
Option value	Measure of maximum possible utility from work-leisure combination	53199	45707	45603	39008
Age	Age at time of interview	59.68	3.60	59.10	3.34
Household net worth	Household net worth ($'0000)	101.26	111.14	82.14	91.73
Other household Income	Income from other family members ($)	28267	47668	38224	55084
Resident children	Has resident dependent children	0.27	0.44	0.18	0.38
Home owner	Owns home outright	0.69	0.46	0.67	0.47
Health condition	Long term health condition or disability (self-reported)	0.23	0.42	0.23	0.42
Years of education	Years of education, e.g. year 12 education = 12, bachelor degree = 15	12.85	2.17	12.65	2.10
Work experience	Percentage of years in paid work since leaving full time education	0.97	0.05	0.78	0.20
Partner employed	Partner/spouse currently employed	0.51	0.50	0.44	0.50
Partner not employed	Partner/spouse not currently employed	0.36	0.48	0.18	0.38
Job satisfaction	Job satisfaction in the previous year (out of 100)	80.41	17.64	80.37	19.82

The reasons for including the remaining explanatory variables are more straightforward. Previous studies of the factors associated with deciding whether to retire or continue working (Woodland, 1987; Norris and Bradbury, 2001; Knox, 2003; Borland, 2005; Cai and Kalb, 2005; Cobb-Clark and Stillman, 2005) have shown that age, gender, health, education, work experience, carer responsibilities, pension eligibility, and owning a home outright are all important determinants of retirement. Not being partnered seems to encourage a longer working life, while men and women who have a partner who has left the labour force are more likely to retire themselves

(Knox, 2003; Warren, 2006). Knox (2003) also found that, for men, flexible work hours and a stress-free work environment led to later retirement.

Based on these previous studies the expectations about the explanatory variables used in our model are as follows. It was expected that the older individuals were, the less likely they would be to remain in work. People in wealthier households and households where other members have high incomes would be less likely to need to continue working, and so more likely to retire. It was hypothesised that mature age people with resident dependent children would be more likely to continue in work, as they need more current income than people who do not have children to support. People who own their home outright would be less likely to remain in work as they require less cash income to achieve any given standard of living, once their mortgage has been paid off.

People with a long term health condition or disability would be less likely to be employed – many would be unable to work or have difficulty finding jobs. Naturally, the prevalence of new ill-health conditions (or the worsening of existing ones) makes employment harder to maintain from both the employer's and employee's point of view. For individuals whose health is compromised a dollar received from retirement income is likely to have considerably more utility than a dollar earned from work.

People with higher levels of education and higher levels of work experience are hypothesised to be more likely to remain in work, because they could presumably earn higher wages. However, some of those able to earn high wages might have decided that they had saved enough for a comfortable retirement and so decided to leave the labour force.

Those who were more satisfied with their job would be less likely to leave the labour force than those who were dissatisfied. Finally, it was expected that those whose partner remained in work were more likely to have kept working themselves. The idea here is that many couples presumably choose to coordinate their activities and retire at the same time.

Regression Results

Table 1.4 and 1.5 provide estimates of the marginal effects of the financial incentive measures, together with other influences on the work versus retirement decision for men and women. It can be seen that, while the signs of marginal effects of the financial incentive variables are as expected for both men and women, the effect of all of the financial incentive variables on the decision to work rather than retire are statistically significant for men, but only accrual is significant for women, and only at the 10% level. In other words, for men but not women, the desire to maximise lifetime income appears to have a significant effect on decision-making.

This Australian result is parallel to Gruber and Wise's (2004) results for most of the 12 countries they studied. In seeking to understand the gender difference, it is reasonable to point out that in most households men are still the main earners, so that it is their continuation or exit from the workforce which is going to make most difference to the household's lifetime income. Women are less likely to be in work, and on average their incomes and superannuation savings are lower. There is also a great deal of

international evidence that, compared with men, they are more influenced by non-monetary factors, including whether their partner continues in work and whether they have continuing caring responsibilities, including responsibility for children still living at home (Gruber and Wise, 2004). In Australia, Warren (2006) confirmed that the factors influencing women's retirement decisions were substantially different from men's, and were more commonly based on family considerations rather than financial incentives.

Table 1.4
Decisions to Continue Working or Retire
Marginal effects from Probit Regressions, Men 55-70

	Accrual	Peak	Option Value
Financial incentive	**-0.0434****	**-0.0080****	**-0.0041***
	(0.0145)	(0.0027)	(0.0018)
Age	0.0008	0.0014	0.0014
	(0.0018)	(0.0017)	(0.0019)
Household net worth	-0.0001*	-0.0001*	-0.0001*
	(0.0001)	(0.0001)	(0.0001)
Income of other household members	-0.0002	-0.0001	0.0001
	(0.0020)	(0.0020)	(0.0018)
Resident children	-0.0514**	-0.0491**	-0.0516**
	(0.0114)	(0.0113)	(0.0115)
Own home outright	0.0615**	0.0584**	0.0621**
	(0.0111)	(0.0109)	(0.0112)
Long term health condition	0.0872**	0.0848**	0.0890**
	(0.0208)	(0.0204)	(0.0211)
Education (years)	0.0018	0.0018	0.0016
	(0.0030)	(0.0029)	(0.0030)
Work experience (%)	-0.2290*	-0.2214*	-0.2314*
	(0.1116)	(0.1100)	(0.1149)
Job satisfaction in previous year	-0.0003	-0.0003	-0.0003
	(0.0003)	(0.0003)	(0.0003)
Employment status of partner (Control = no partner)			
Partner employed	-0.0145	-0.0188	-0.0219
	(0.0209)	(0.0202)	(0.0208)
Partner not employed	0.0458*	0.0403*	0.0394^{+}
	(0.0235)	(0.0221)	(0.0228)
Observations	1308	1308	1308
Pseudo R^2	0.1769	0.1770	0.1715

Notes: Robust standard errors in parentheses. $^{+}$ significant at 10%; * significant at 5%; ** significant at 1%.
Regression results from the model with age category dummies are reported in appendix.

Table 1.5
Decisions to Continue Working or Retire
Marginal effects from Probit Regressions, Women 55-70

	Accrual	Peak	Option Value
Financial incentive	**-0.0481**$^{+}$	**-0.0040**	**-0.0031**
	(0.0265)	(0.0047	(0.0034)
Age	0.0034	0.0060*	0.0055^{+}
	(0.0033)	(0.0029)	(0.0032)
Household net worth	-0.0002	-0.0002	-0.0002
	(0.0001)	(0.0001)	(0.0001)
Income of other household members	0.0029	0.0029	0.0029
	(0.0021)	(0.0022)	(0.0022)
Resident children	-0.0395^{+}	-0.0378^{+}	-0.0379^{+}
	(0.0193)	(0.0198)	(0.0197)
Own home outright	0.0452*	0.0456*	0.0451*
	(0.0186)	(0.0187)	(0.0187)
Long term health cond'n	0.0169	0.0184	0.0182
	(0.0216)	(0.0216)	(0.0216)
Education (years)	0.0008	-0.0003	-0.0001
	(0.0044)	(0.0045)	(0.0046)
Work experience (%)	-0.0623	-0.0627	-0.0608
	(0.0446)	(0.0441	(0.0445)
Job satisfaction in previous year	-0.0010*	-0.0010*	-0.0010*
	(0.0004)	(0.0004)	(0.0004)
Employment status of partner (Control = no partner)			
Partner employed	0.0006	-0.0010	-0.0012
	(0.0242)	(0.0244)	(0.0244)
Partner not employed	0.0819**	0.0818**	0.0812**
	(0.0339)	(0.0343)	(0.0343)
Observations	1010	1010	1010
Pseudo R^2	0.0690	0.0658	0.0660

Notes: Robust standard errors in parentheses. $^{+}$ significant at 10%; * significant at 5%; ** significant at 1%.
Regression results from the model with age category dummies are reported in appendix.

Turning to non-financial variables, for both men and women owning their home outright increased the probability of retiring, as did having a partner who had already left the workforce, and having resident dependent children had a negative influence on leaving the workforce.

For men, a striking result concerns the effect of health. Having a long term health condition or disability which has lasted for six months or more is the variable most strongly related to the decision to exit the labour force. These results suggest that, keeping other things equal, having a long term health condition or disability increases the probability of retirement by around 9%. In this context it is important to record that around 30% of HILDA respondents who answered detailed questions about their reasons for retirement in the 2003 questionnaire reported that health was a major reason for exiting the labour force. In taking their decisions they were in many cases influenced by their doctors and partners, as well as by their own concerns. It is also the case that men with more years of work experience tend to stay in work longer than

those who have less work experience. This is likely to be because they earn more, and perhaps because they enjoy their work more.

For women, confirming earlier results, 'family' variables appeared to be more important than for men. The evidence in Table 1.6 also indicates women are influenced in their decision to continue in work or retire by their partner's employment status. For women, having a partner who is not in the labour force increases the probability of retiring by about 8%. Furthermore, women with higher levels of job satisfaction were more likely to remain in the labour force.

Financial incentives to retire, by age cohort

The previous results suggest that for men, there are financial incentives to retire, but are there incentives to retire from the labour force 'early', that is, before age pension eligibility age? In order to test the impact of financial incentives before and after age pension eligibility, the regressions were run separately for men aged 55 to 59, 60 to 64 and 65 to 70; and for women aged 55 to 60 and 61 to 70.[11] Tables 1.6 and 1.7 show the marginal effects for the financial incentive variables for men and women, by age group.[12]

Table 1.6
Financial Incentives to Retire – Marginal Effects, Men, by age cohort

	Age Group			
	55-59	60-64	65-70	Total (55-70)
Accrual ($)	**0.0047**	**-0.0534**$^{+}$	**-0.1880****	**-0.0434****
	(0.0079)	(0.0282)	(0.0719)	(0.0145)
Peak Value	**-0.0008**	**-0.0166***	**-0.0833****	**-0.0080****
	(0.0011)	(0.0074)	(0.0349)	(0.0027)
Option Value	**0.0002**	**-0.0090**$^{+}$	**-0.0494***	**-0.0041***
	(0.0010)	(0.0046)	(0.0226)	(0.0018)

Notes: Robust standard errors in parentheses. $^{+}$ significant at 10%; * significant at 5%; ** significant at 1%. Full results are available from the authors upon request.

For men aged between 55 and 59, the financial incentive variables are not significant and the signs of the coefficients for SSW accrual and option value are not as expected. For men aged between 60 and 64, and also for men aged between 65 and 70, all three financial incentive variables are significant and the signs are as expected. For men between 65 and 70, the marginal effects of the financial incentive variables are larger. These results suggest that financial incentives to retire early do exist, particularly for men between the ages of 60 and 64, and once age pension eligibility age has been reached, the financial incentives to retire are much stronger.

[11] Women were divided into only 2 age groups because age pension eligibility age is earlier (61 in 2002 compared to 65 for men) and the number of women still working after the age of 60 is relatively small.
[12] Complete regression results are available from the authors upon request..

Table 1.7
Financial Incentives to retire – Marginal Effects, Women, by age cohort

	Age Group		
	55-60	61-70	Total (55-70)
Accrual ($)	**-0.0467**	**-0.0513**	**-0.0481**$^{+}$
	(0.0357)	(0.0565)	(0.0265)
Peak Value ($'0000)	**-0.0049**	**-0.0248**	**-0.0040**
	(0.0041)	(0.0192)	(0.0047)
Option Value ($'0000)	**-0.0042**	**-0.0127**	**-0.0031**
	(0.0158)	(0.0158)	(0.0034)

Notes: Robust standard errors in parentheses. $^{+}$ significant at 10%; * significant at 5%; ** significant at 1%.

When the regressions were run separately for women before and after age pension eligibility age, the signs of the marginal effects of all three financial incentive variables were all as expected. However, none of the financial incentive variables were significant, confirming the conclusion that financial incentives have little importance in women's decisions to retire.

These results suggest that for men aged between 60 and 64 there are significant financial incentives to retire from the labour force, and once age pension eligibility age had been reached, the incentive to retire is much stronger. For women the financial incentives before age pension eligibility age are not significant, but there appears to be a weak incentive to retire once age pension eligibility age has been reached.

6. Simulating Policy Changes

To illustrate the effects of the financial incentive variables on retirement behaviour, we simulate the effect of delaying age pension eligibility by three years. The pension income components of the incentive measures are recalculated so that age pension is only received after the age of 68 for men and 64 for women. The probabilities of receiving other types of income support are extended by three years, based on the probability of receiving DSP, NewStart, Mature Age Allowance or Service Pension at the age of 64 for men and 60 for women. Receipt of the deferred pension bonus is also delayed by three years. The models are re-estimated with the new financial incentive variables, holding everything else constant.

Following Gruber and Wise (2004), we use three different specifications for the policy simulation. The simulations differ from each other by the use of age indicators. The first simulation method (S1) uses a linear age specification, the second method (S2), uses age indicators and the third method (S3), uses age indicators in the estimation and adjusted age indicators in the simulations. The third method aims to capture the long run effect of the policy reform by approximating the change in the social norm of the retirement age. For example, to simulate the social norm shift due to the three year eligibility delay, the age indicator for a given age is taken to be the estimated age indicator three years prior to the given age. The basic idea is that once the 3 year delay is introduced, the "normal" retirement age will shift to 68 for men and 64 for women. Therefore, the retirement rate spikes that we observe under current policy environment (at age 65 for men and at 61 for women) will shift to 68 for men and 64 for women.
Simulation method S3 is expected to produce the most pronounced effect in the predicted retirement rates due to the policy change, while S2 is expected to produce the

least. One can argue that the figures produced by S2 will underestimate the true effect hence can be seen as lower boundaries. Similarly, method S3 will probably overestimate the true effect; hence the figures will serve as upper boundaries of the true effect of the policy reform. We also expect that the method that uses the linear age specification (method S1) will predict retirement rates within these boundaries.

Figures 1 to 6 compare the predicted probability of retirement for men when the age pension eligibility age is 65 and when eligibility age is raised to 68. The results are produced using accrual and option value models.[13] Using dollar accrual as the financial incentive measure (method S1), Figure 1 shows that when age pension eligibility age is increased, the predicted probability of retiring for men aged between 65 and 67 is lower, and higher for men aged 68 and 69. When the linear age variable is used, the predicted probability of retiring at the age of 65 is 12.9%, compared to 15.7% for the base case, and at the age of 69, the predicted probability of retiring is 22.2% when pension eligibility age is increased by three years, compared to 19% for the base case. When age dummies are used (method S2) in Figure 2, the predicted probability of retiring at the age of 65 drops from 29.3% to 26% when age pension eligibility is delayed. In Figure 3, we approximate the long run effect of the policy change by shifting all age specific behaviour by three years in addition to the change in the accrual measure. The simulated retirement rates are drastically different than the rates that are predicted using the current policy environment. We see that the delay in age pension age shifts the expected retirement age by 3 years for men. A big drop in retirement rates at age 65 is followed by a significant increase in the predicted retirement rate at age 68. Under the policy reform, the predicted retirement rate for men at age 65 drops from 29.3 % to 8 %. By contrast, the retirement rates at age 68 increases to 35 % following the policy change from its initial predicted value of 14 %. Using the option value measure, there is hardly any difference in the predicted probability of retiring whether the age pension becomes available at the age of 65 or 68 when the change in age specific behaviour is not taken into account (Figures 4 and 5). The predicted probability of retiring at each age is increased by only around 0.2% and 0.5% at age 70 when linear age is used. The retirement rates under policy reform are significantly different than base case only when we use method S3. In Figure 6 we observe the same 3 year shift in the retirement age that we observe in the accrual model. However, this difference is entirely due to the change in the age specific behaviour rather than the change in the option value variable.

For women, using the accrual measure, the probability of retirement between the ages of 61 and 63 is lower if the pension age is delayed and for 64 and 65 year old women the probability of retirement is higher. However, because the age pension bonus will also be delayed by three years, the predicted probability of women retiring between the ages of 66 and 68 is lower when age pension eligibility is delayed. When the linear age variable is used (Figure 7), the predicted probability of retiring for women aged 61 drops from 13.2% in the base case to 10.5%. For women aged 65, the predicted probability of retiring increases from 13.3% to 15.6%. Using option value (Figures 10 to 12) the effect of increasing age pension eligibility age on predicted probabilities of retiring is very small, in Figure 11 the decrease in the probability of retiring is shown to be around 0.2% at each age.

[13] Figures using Peak Value model are available upon request.

Figure 1: Effect of delaying pension eligibility on predicted probability of retirement, Men aged 55 to 70, using linear age and dollar accrual

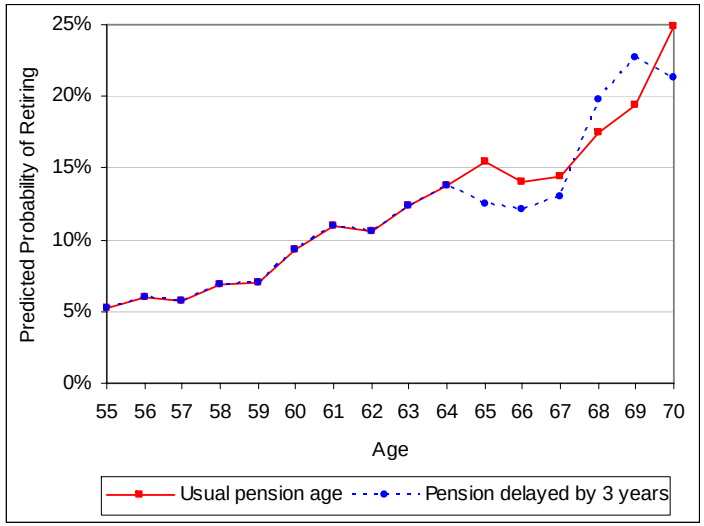


Figure 2: Effect of delaying pension eligibility on predicted probability of retirement, Men aged 55 to 70, using age dummies and dollar accrual

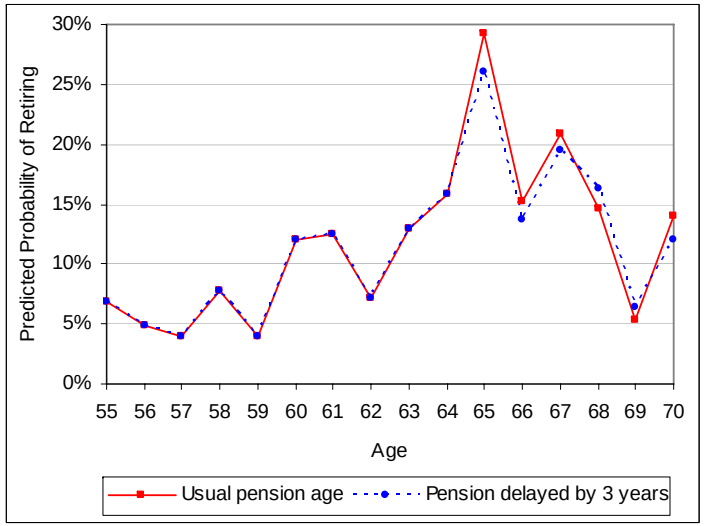


Figure 3: Effect of delaying pension eligibility on predicted probability of retirement, Men aged 55 to 70, using age dummy shift and accrual

Figure 4: Effect of delaying pension eligibility on predicted probability of retirement, Men aged 55 to 70, using linear age and option value

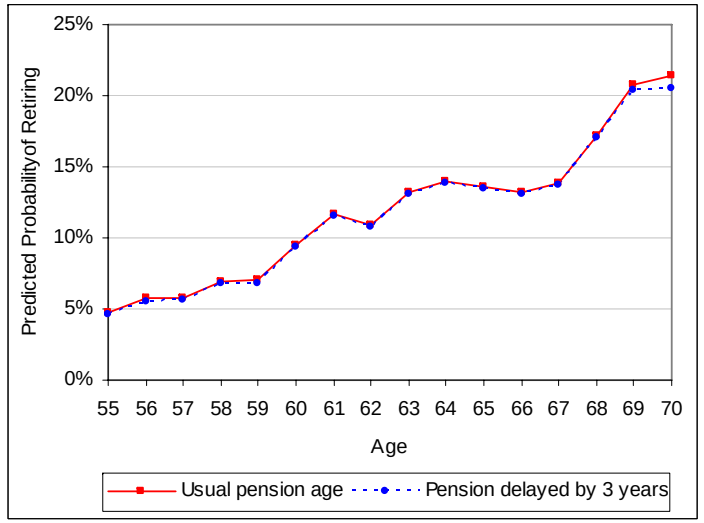


Figure 5: Effect of delaying pension eligibility on predicted probability of retirement, Men aged 55 to 70, using age dummies and option value

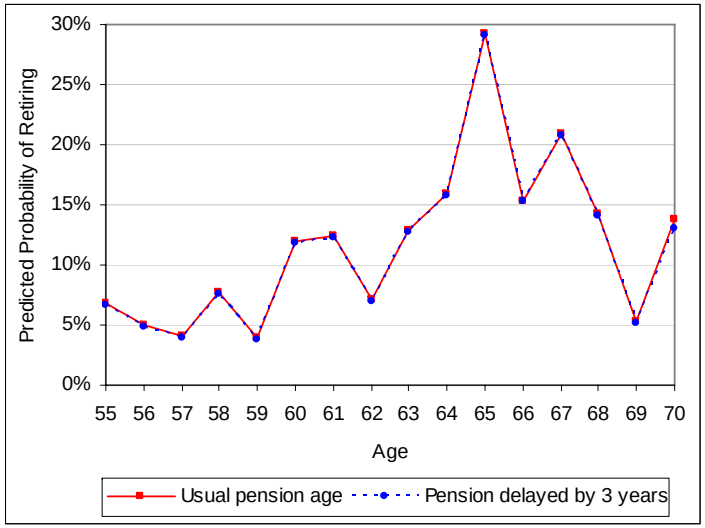


Figure 6: Effect of delaying pension eligibility on predicted probability of retirement, Men aged 55 to 70, using age dummy shift and option value

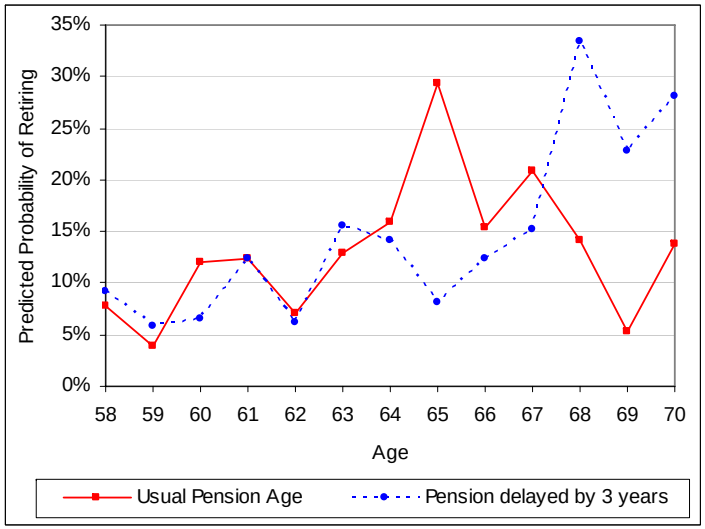


Figure 7: Effect of delaying pension eligibility on predicted probability of retirement, Women aged 55 to 70, using linear age and dollar accrual

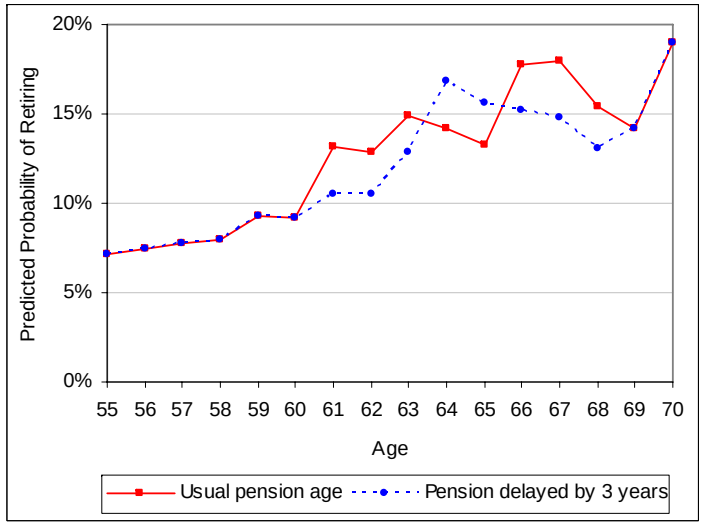


Figure 8: Effect of delaying pension eligibility on predicted probability of retirement, Women aged 55 to 70, using age dummies and dollar accrual

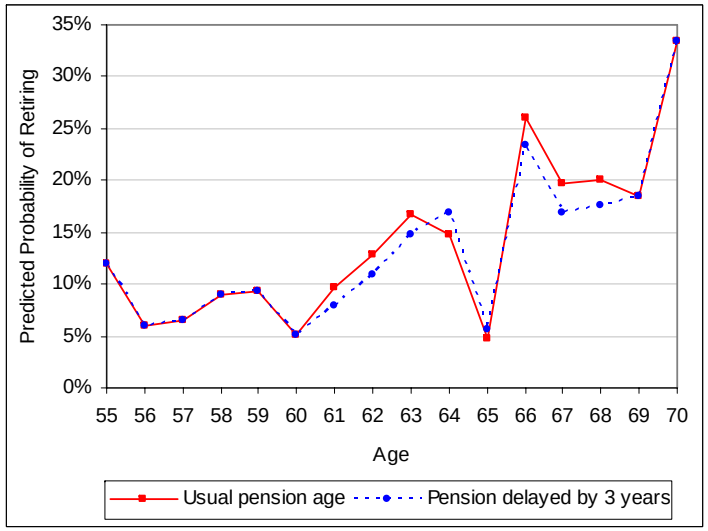


Figure 9: Effect of delaying pension eligibility on predicted probability of retirement, Women aged 55 to 70, using age dummy shift and accrual

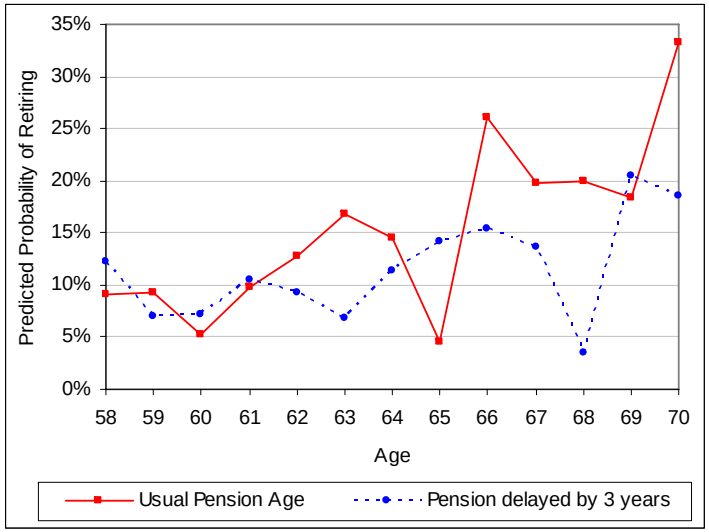


Figure 10: Effect of delaying pension eligibility on predicted probability of retirement, Women aged 55 to 70, using linear age and option value

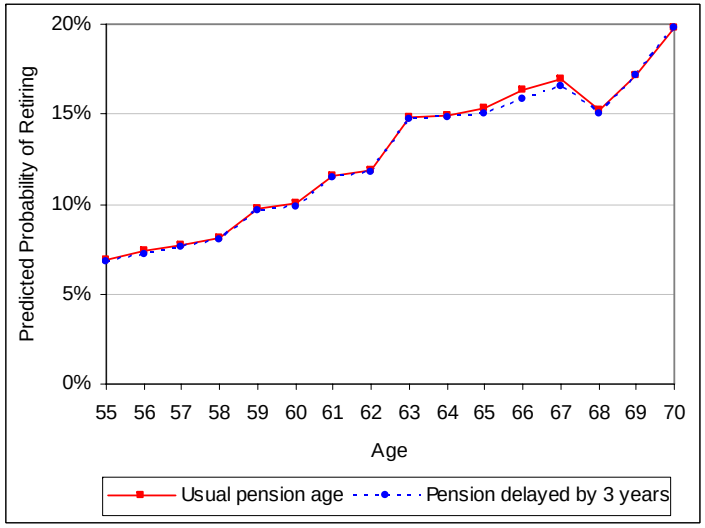


Figure 11: Effect of delaying pension eligibility on predicted probability of retirement, Women aged 55 to 70, using age dummies and option value

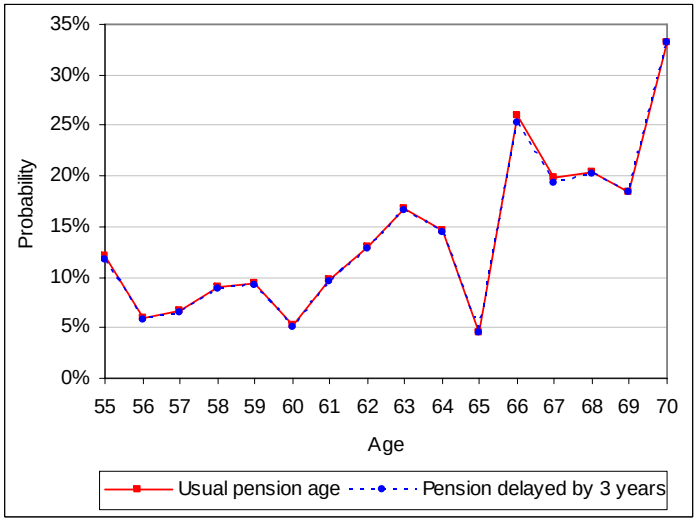
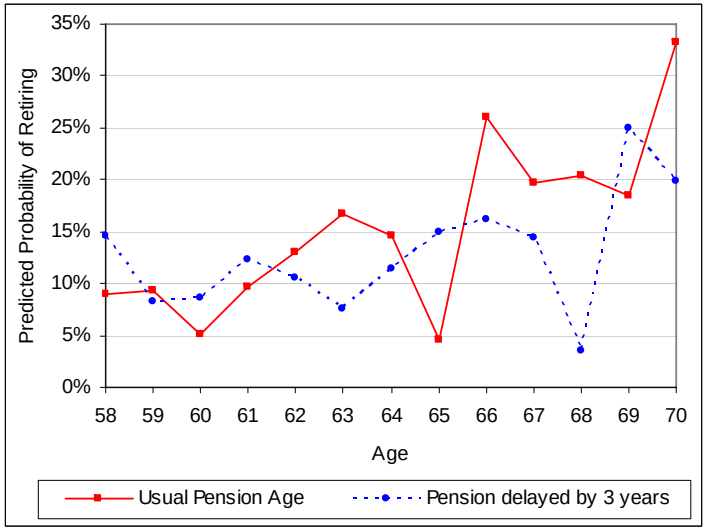


Figure 12: Effect of delaying pension eligibility on predicted probability of retirement, Women aged 55 to 70, using age dummy shift and option value



7. Conclusions

This paper provides an evaluation of the financial incentives for retirement underlying the Australian retirement system using a sample of men and women aged between 55 and 70 from the HILDA Survey. Overall, our results confirm the value of the Gruber and Wise (2004) approach to modeling the effects of financial incentives on the workforce decisions of mature age people, particularly mature age men. We find that for men, the Australian retirement system provides financial incentives to retire early, while for women financial incentives are less significant, as the factors that influence women's retirement behaviour are more commonly found to be health and family related, rather than financial incentives. When those who have already reached age pension eligibility age are considered separately, the financial incentives to retire for men are stronger than before, indicating that, for those who are eligible to receive the age pension, there are strong incentives not to continue in paid work past age pension eligibility age.

Our policy simulations show that, in the short term, delaying age pension eligibility age by three years will provide some incentive to remain in work until age pension eligibility age has been reached. However, according to our simulations, the major effect of this policy reform will be in the long run, when the social norm of retirement age is shifted towards the new "normal" retirement age.

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Appendix

Calculations of expected retirement income

For each individual, expected annual retirement income is calculated for each remaining year of life. Life expectancy tables are used to predict survival rates and age of death. Expected retirement income is defined as the sum of pension income and income from superannuation. All incomes are discounted back to present values (2002 prices), using a standard discount rate of 3%.

It is assumed that before retirement superannuation is invested at a rate of 6% (real). It is also assumed that when an individual eventually retires, super is invested at the same rate as before retirement (6% real), and that these assets are drawn down in equal amounts each year for the rest of the person's life (i.e. superannuation is exactly exhausted at death, if the person lives to exactly his/her predicted age).[14] Use of an alternative rate of return of 4% did not substantially change interpretation of the key results relating to financial incentives. For people with potential annual retirement incomes of more than $24000, superannuation income is assumed to be taxed at 15% (a figure intended to reflect average actual rates).[15]

Pension income

Potential age pension income is calculated based on 2002 payment rates. In 2002, the full age pension was $429.40 per fortnight for a single person and $358.40 (each) for couples. For each person, age pension eligibility was checked against both the income test and the assets test, and the amount of age pension then allocated according to whichever test gave the lower amount of pension. For most people, this was the income test.

Under the income test in 2002, the first $34000 ($57400 for pensioner couples) of financial assets were deemed to earn 2.5%, and financial assets over these amounts were deemed to earn 4% - actual income from financial assets was not counted. Single people could earn up to $116 per fortnight and still receive the full pension, and for each dollar over this amount, the pension was reduced by 40 cents. Couples could earn a combined amount of $204 before their pension was affected, but for each dollar over this amount their combined pension was reduced by 40 cents.

Under the assets test in 2002, the age pension was reduced by $3 per fortnight according to home ownership and marital status, as shown in Table A.1.

Table A.1: Asset test thresholds for age pension in 2002

Family Situation	*For full pension*	*For part pension*
Single homeowner	Up to $145250	Less than $290500
Couple homeowners (combined)	Up to $206500	Less than $447500
Single non-homeowner	Up to $249750	Less than $395000
Couple non-homeowners (combined)	Up to $311000	Less than $552000

[14] People are assumed to live until the average life expectancy, as determined in ABS Life Tables. If the individual lives longer than average life expectancy, they are assumed to rely solely on the age pension for those additional years.

[15] These rates are scheduled to change on July 1 2007, following announcements in the 2006 budget.

For those who would be eligible for an age pension, but continue working beyond age pension eligibility age the deferred pension bonus amount is added to social security wealth. While working for one extra year beyond pension eligibility age has only a very small impact on SSW (an extra $800 for couples and $1000 for singles), people who would be eligible for a full age pension but continue working for an extra five years beyond age pension eligibility age receive a lump sum payment of around $25000 if they are single and $21000 if they have a spouse or partner.

For people under age pension eligibility age, it is assumed that, if they were not working, they would be eligible for another type of government income support (e.g. Newstart payments, mature age allowance, service pension, or disability support pension) subject to appropriate eligibility and means tests, until they reached age pension eligibility age.[16]

For men under the age of 65 and women under the age of 62, potential income support from the sources mentioned above is calculated in 2002 values, using the income and assets tests appropriate for that year. Potential income from government pensions is then allocated to the individual by multiplying the probability of receiving that type of income support for a person of that age and gender. The amount of income support that would be received is then allocated, subject to means tests based on individual circumstances.[17]

For disability support pension and the service pension, the payment rates and means tests are the same as for the age pension. However, the payment rates for Newstart allowance and mature age allowance are slightly lower, and, while the assets test is the same for all pensions, the income test for Newstart and mature age allowance are stricter than those for age pension and DSP. As a result, our calculations of expected pension incomes for people under age pension age usually result in lower values than expected pension income once age pension age is reached.

[16] For people who would have been eligible for a full or part age pension, but continue working after age pension eligibility age, the lump sum they would receive when they retire is calculated (9.4% of age pension foregone, for a maximum of five years) is calculated and included in the social security wealth calculation measure.

[17] Probabilities by age and gender were calculated using HILDA income support data.

Table A.2 Decisions to Continue Working or Retire: Marginal effects from Probit Regressions, Men 55-70 (Dummy variables for age)

	Accrual	Peak	Option Value
Financial incentive	**-0.0327***	**-0.0072****	**-0.0037***
	(0.0128)	(0.0025)	(0.0017)
Age (control = 55)			
56	-0.0216	-0.0225	-0.0231
	(0.0191)	(0.0176)	(0.0188)
57	-0.0273	-0.0295	-0.0307
	(0.0184)	(0.0164)	(0.0175)
58	-0.0060	-0.0076	-0.0097
	(0.0228)	(0.0215)	(0.0222)
59	-0.0317	-0.0327	-0.0347
	(0.0164)	(0.0146)	(0.0155)
60	0.0068	0.0006	0.0004
	(0.0280)	(0.0253)	(0.0269)
61	-0.0007	-0.0075	-0.0087
	(0.0255)	(0.0223)	(0.0237)
62	-0.0252	-0.0276	-0.0292
	(0.0183)	(0.0157)	(0.0170)
63	-0.0037	-0.0104	-0.0109
	(0.0268)	(0.0231)	(0.0250)
64	0.0063	0.0006	0.0005
	(0.0322)	(0.0286)	(0.0310)
65	0.0721	0.0761^{+}	0.0803^{+}
	(0.0622)	(0.0616)	(0.0661)
66	0.0034	0.0041	0.0044
	(0.0407)	(0.0388)	(0.0417)
67	0.0309	0.0299	0.0307
	(0.0626)	(0.0612)	(0.0650)
68	-0.0142	-0.0149	-0.0162
	(0.0332)	(0.0300)	(0.0320)
69	-0.0432	-0.0418^{+}	-0.0446^{+}
	(0.0108)	(0.0096)	(0.0098)
70	-0.0310	-0.0264	-0.0278
	(0.0218)	(0.0230)	(0.0251)
Household net worth	-0.0001*	-0.0001*	-0.0001*
	(0.0001)	(0.0001)	(0.0001)
Income of other household members	0.0006	0.0008	0.0008
	(0.0020)	(0.0019)	(0.0019)
Resident children	-0.0512**	-0.0486**	-0.0510**
	(0.0107)	(0.0106)	(0.0107)
Own home outright	0.0575**	0.0545**	0.0578**
	(0.0104)	(0.0101)	(0.0104)
Long term health condition	0.0871**	0.0841**	0.0883**
	(0.0202)	(0.0197)	(0.0203)
Education (years)	0.0019	0.0019	0.0018
	(0.0030)	(0.0028)	(0.0030)
Work experience (%)	-0.2165*	-0.2044^{+}	-0.2127^{+}
	(0.1131)	(0.1102)	(0.1155)
Job satisfaction in previous year	-0.0003	-0.0003	-0.0003
	(0.0003)	(0.0003)	(0.0003)
Employment status of partner (Control = no partner)			
Partner employed	-0.0207	-0.0226	-0.0256
	(0.0195)	(0.0187)	(0.0194)
Partner not employed	0.0390*	0.0354^{+}	0.0345^{+}
	(0.0215)	(0.0203)	(0.0209)
Observations	1308	1308	1308
Pseudo R^2	0.2003	0.2036	0.1984

Notes: Robust standard errors in parentheses. $^{+}$ significant at 10%; * significant at 5%; ** significant at 1%.

Table A.3 Decisions to Continue Working or Retire: Marginal effects from Probit Regressions, Women 55-70

	Accrual	Peak	Option Value
Financial incentive	**0.0064**	**-0.0049**	**-0.0037**
	(0.0292)	(0.0047)	(0.0033)
Age (control = 55)			
56	0.0230^{+}	-0.0496^{+}	-0.0503^{+}
	(0.0228)	(0.0228)	(0.0226)
57	0.0243	-0.0459	-0.0469
	(0.0240)	(0.0243)	(0.0242)
58	0.0296	-0.0254	-0.0266
	(0.0285)	(0.0292)	(0.0288)
59	0.0298	-0.0313	-0.0336
	(0.0288)	(0.0292)	(0.0287)
60	0.0242^{+}	-0.0591^{+}	-0.0604^{+}
	(0.0227)	(0.0224)	(0.0222)
61	0.0313	-0.0330	-0.0342
	(0.0295)	(0.0302)	(0.0298)
62	0.0442	-0.0082	-0.0107
	(0.0387)	(0.0423)	(0.0416)
63	0.0484	0.0016	-0.0025
	(0.0456)	(0.0472)	(0.0464)
64	0.0552	-0.0053	-0.0112
	(0.0473)	(0.0498)	(0.0480)
65	0.0317	-0.0636	-0.0662
	(0.0250)	(0.0262)	(0.0240)
66	0.0902	0.0766	0.0650
	(0.0809)	(0.0848)	(0.0831)
67	0.0930	0.0346	0.0251
	(0.0768)	(0.0836)	(0.0808)
68	0.1332	0.0634	0.0508
	(0.1012)	(0.1172)	(0.1130)
69	0.1532	0.0362	0.0233
	(0.1113)	(0.1168)	(0.1095)
70	0.1942	0.1459	0.1283
	(0.1730)	(0.1801)	(0.1744)
Household net worth	-0.0002	-0.0002	-0.0002
	(0.0001)	(0.0001)	(0.0001)
Income of other household members	0.0028	0.0028	0.0028
	(0.0021)	(0.0021)	(0.0021)
Resident children	-0.0428*	-0.0415^{+}	-0.0416^{+}
	(0.0183)	(0.0186)	(0.0186)
Own home outright	0.0440*	0.0444*	0.0437*
	(0.0181)	(0.0181)	(0.0181)
Long term health condition	0.0164	0.0173	0.0170
	(0.0209)	(0.0208)	(0.0208)
Education (years)	-0.0001	-0.0004	-0.0002
	(0.0044)	(0.0044)	(0.0045)
Work experience (%)	-0.0627	-0.0622	-0.0602
	(0.0434)	(0.0429)	(0.0432)
Job satisfaction in previous year	-0.0010*	-0.0010*	-0.0010*
	(0.0004)	(0.0004)	(0.0004)
Employment status of partner (Control = no partner)			
Partner employed	0.0001	-0.0012	-0.0012
	(0.0236)	(0.0236)	(0.0236)
Partner not employed	0.0833**	0.0822**	0.0815**
	(0.0334)	(0.0335)	(0.0335)
Observations	1010	1010	1010
Pseudo R^2	0.0869	0.0862	0.0865

Notes: Robust standard errors in parentheses. $^{+}$ significant at 10%; * significant at 5%; ** significant at 1%.