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“Australian pre-July 2007 “Retirement Tax biases and the
likely effect of tax reform on retirement plans”

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Abstract:

We develop a simulation model explaining the accrual of social security wealth gained from working one year beyond retirement and from this calculate an implicit tax rate on the additional year's work. We find that the pre July 2007 Australian tax on retirement benefits is biased in favour of ages 59 and less, while the implicit rate is positive on retirement past 59. We also use the results of a national survey of 2,500 households (ASRAM SURVEY) to determine the likely response to the tax changes implemented in July 07 and find that half those sampled are either very likely or likely to change their expected retirement date in response to tax reform.

Key words: Retirement intentions, Implicit tax, Social security wealth

JEL codes: I38, J26

1. Introduction

The demographic prognosis for the 21st century is that all national populations will age structurally and most in the developed world will ultimately decline in size. Australia's structural ageing is less pronounced than many of its counterpart countries, but it will nevertheless experience stagnating growth from a decade hence. One often stated concern is that the social security systems of nations like Australia will not be sustainable in their present form because the next generation will not be able to raise sufficient taxes to support a burgeoning pensions bill. These intergenerational financial pressures are compounded by another trend, namely, that over the past fifteen years employees have been leaving the workforce at ages well below the now-defunct 'official' retirement age, 65 years. In Australia and other nations this decline in labour force participation has been partly explained by generous social security provisions, but also by redundancy- and retrenchment-driven 'structural retirement' (Jackson, Walter, Felmingham and Spinaze 2006).

Our first aim in this study is to determine if the Australian arrangements for taxing retirement benefits as they existed before July 1 2007 created a bias in favour of early retirement. Our second aim is to assess the extent to which the reforms of the Australian taxation system effective from that date are likely to alter the retirement intentions of those nearing retirement. We are motivated in pursuing these aims by a recent shift in policy emphasis which encourages workers to stay on the job longer. Clearly if we find an unfavourable bias against working longer, then the sweeping reforms announced in the 2006-2007 federal budget are warranted. Their potential effect will depend first and foremost on the reaction of potential retirees to these reforms and if there is only a limited reaction then

such reforms will only make a limited contribution to keeping workers at work.

In relation to the first aim, the presence of early retirement biases in the tax system pre 1/07/07 is determined by calculating the implicit taxation rate on income derived by workers who work one more year beyond retirement. We find this implicit tax to be positive on those aged 60 plus, but negative on incomes of workers approaching retirement at ages 59 or less. This negative tax effect is a subsidy favouring early retirement.

The second aim of the paper is fulfilled by using the results from the “Australian Survey of Retirement Attitudes and Motivations” (ASRAM 2006) commissioned as part of an ARC discovery grant. The Survey is described in greater detail in section 4 of this paper.

Although the literature pertaining to the effects of population ageing on the economy is profuse, there are only a few studies which quantify the effects of social security provisions on retirement intentions. A seminal piece on this topic was assembled by Gruber and Wise (1999). This is a study of the relationships between social security plans and retirement patterns in eleven countries: Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, UK and USA. The authors of the individual country studies are shown on the list of references which follow the text. Our study is based on the foundation designed by Gruber and Wise. Three features stand out from these 11 individual country studies: first, there is a strong relationship between what can be defined as ‘early’ and ‘normal’ retirement ages, and actual exit from the workforce. ‘Early’ retirement typically occurs in an individual’s mid-fifties when superannuation benefits (not government pensions) become accessible for the first time. ‘Normal’ retirement typically occurs around age 65, while ‘actual’ exit typically falls somewhere between the two. Second, existing social service provisions are placing a tax

burden on working beyond early retirement ages thereby providing an incentive for early retirement. Third, the tax incentives for early retirement vary substantially across countries.

Gruber and Wise (1999, table 1, p29) summarize these implicit tax rates on earnings derived from working beyond the early retirement ages along with statistics about labour force participation and unused labour capacity. The eleven-nation average of the implicit tax rate on earnings after retirement is 50.3 percent. This means that those who continue to work beyond the retirement age are on average taxed at 50% on additional earnings in this sample of countries.

The assessment of an early retirement bias is based on Australian data and is applied to a modification of the Gruber and Wise (1999) approach. The study is designed to examine the nature of retirement incentives confronting single person and couple households. This classification reflects the structures of the Household Wealth and Income Survey on which this study is based. The survey of the Household, Income and Labour Dynamics in Australia (HILDA) survey is focused on households.

The following section (section two) examines the relevant literature in which we summarise the Australian experience of labour force participation and relevant population parameters. The method of analysis, data series and characteristics pertaining to the data are outlined in section three, where the results of the study are also discussed. The response of individuals to superannuation tax reforms are assessed in section four and policy implications are outlined in a closing section five.

2. Literature Review

The imperative for studying individual retirement intentions is driven largely by the importance of the macroeconomic impact of ageing, generally the larger the expected impact, the stronger is this imperative. This follows from the view that at least some of the negative effects of ageing can be ameliorated by changing intended retirement intentions. For example, the Australian government's 2006/07 budget included superannuation taxation policy initiatives which are designed to delay individuals' decisions about their expected retirement dates. By convincing individuals that there is a net return in delaying retirement, some of the recognised costs of ageing may lessen as a consequence. These costs are identified by the Australian Productivity Commission (2005) and are briefly summarised. One quarter of Australians will be aged 65 plus years by 2045, twice the current proportion. This will have several macroeconomic consequences: the participation rate will fall from 63.5 percent today to 59 percent in 2025; tax revenue will follow the per capita growth rate down, while an increased government pension burden forces expenditure up creating budgetary pressures in the form of increasing budget deficits. The most important driver of growing federal and state budget deficits is public health expenditure which is expected to rise by 4.5 percentage points in 2045. Timely intervention now might alleviate the need to apply a 'big-bang' correction later.

Keese (2005) outlines the policy responses required of the group of OECD member countries to ageing and notes the importance of modifying pension/superannuation rules to remove biases in favour of early retirement, while noting in most OECD countries that the effective retirement age falls well short of the official age for retirement. Australia is no

exception as the effective age (63 years) of recent retirees is less than the recently abolished official age of 65 years (ABS 2006). In its overview of Australian ageing and employment policies the OECD (2005) argues the case for removing those biases favouring early retirement as an incentive for working longer. Those incentives are the focus in the first part of this paper. The same argument is advanced by Carey (1999) in relation to specific Australian labour market characteristics. Carey's work is particularly valuable in relation to a policy analysis of the retirement decision in an Australian setting. If it is possible to lift participation rates back to 1960s levels for the 55 plus year age group by 2030 then the economic effects of Australian ageing will be greatly diminished. According to Carey, increased participation on this scale will offset about half the effects of population ageing on the economy.

Borland's (2005) definition of retirement transition appears to include a broader range of alternatives to either working in a relatively permanent capacity to not working at all. The sudden transition from relative ~~as~~ to no work at all ignores the prospect of phased retirement when the number of hours worked gradually diminishes over a period of time. Phased retirement is proving to be increasingly popular. According to Cameron (2005) the desire for phased retirement in Australia is increasing, up from 47 percent in 2001 to 55 percent of potential retirees in 2004. Cameron's ANOP survey (2005) canvasses a broad range of attitudes to superannuation, savings and retirement choices and reveals a number of factors which account for an apparent reluctance to delay retirement; included here are negative business attitudes towards the employment of older workers and a lack of understanding about the complexities of private superannuation and its tax effectiveness as a source of retirement income. In the second part of this paper, we put this proposition about superannuation taxes to

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the test by asking a sample of forthcoming retirees about their responses to the Australian government's superannuation tax reforms effective from July 1 2007, in particular, the potential effect on expected retirement.

The following study of retirement incentives is motivated by an ongoing National Bureau of Economic Research Study of social security provisions around the world. In the first of three phases of that study, Gruber and Wise (1999) examine the impact of the incentives inherent in social security systems in 11 developed countries. The major finding from the first stage is that security systems encourage older workers to leave the workforce early. The results of the second phase published by Gruber and Wise (2004), illustrate the large effects that changes in social security can have on labour force participation of older worker in these 11 nations. Gruber and Wise (2005), in the final phase of their project, measure the reduced costs of ageing which flow from increased labour force participation by older workers in 12 developed nations.

It is the first phase of this NBER study which is more relevant to this study because it provides a modelling basis for pursuing our first aim, which is to identify the presence of an early retirement bias in Australia's pre July 07 superannuation tax regime.

3. The incentive effects of plan provisions

3(a) Australian retirement entitlement provisions

Historically, Australian males have been able to access a government pension at age 65 and females at age 60, so these have become Australia's 'normal' retirement ages. However, changes have recently been made to the age of access for females; it is currently 62 years of age,

and over the next decade it will rise to 65 years¹. The lowest of these actual dates (55 years) therefore defines the prospect of early retirement for Australian workers and consequently this age has tended to become the early retirement age.

Superannuation schemes extant pre July 2007 are of two major types: employer sponsored schemes and self employed schemes. The employer sponsored schemes require a minimum employer contribution of 9 percent on annual earnings and also accommodate employee contributions. Many employers contribute more than the 9 percent minimum and employees often boost their own contributions by way of salary sacrifice. Contributions which have not been taxed at the time individual superannuants reach the eligibility age and withdraw their benefits are tax deductible. Employer sponsored schemes were taxed at three points: as funds are invested in a Scheme; on the earnings accrued by the fund and upon the withdrawal of benefits. End superannuation benefits were taxed at 15 percent provided entitlements were less than a Reasonable Benefit Limit (RBL). Self employed people may establish their own superannuation schemes and subject to age eligibility may qualify for tax deductions. Contributions up to \$5,000 or less are 100 percent tax deductible while 75 percent of contributions up to \$100,587 (age 50-70), \$40,560 (age 35-49) and \$14,603 (age <=35) were deductible prior to July 1 2007. In addition, individuals could make personal contributions to approved (for tax concessions) superannuation funds. Further, individuals earning less than \$28,000 annually may benefit from the Australian government's co-contribution superannuation scheme which entails a government contribution of \$1.50 for every \$1.00 invested by the individual in superannuation. This is the situation as it prevailed prior to July 1

¹ People with private superannuation can also access their funds at age 55 if they were born prior to 1995 and age 60 if born past this date.

2007.

From July 1 2007, the end benefit taxed at 15 percent is tax free for those over 60 years of age. Further, the RBL, which placed a ceiling on the value of the superannuation benefits qualifying for the 15 percent tax rate also disappears. Prior to July 1 2007 superannuation benefits were taxed at the full marginal rate in excess of the RBL.

3.(b) *Simulation of tax biases*

The following simulation analysis determines if the superannuation tax system biased superannuation benefits in favour of early retirement, in particular, at ages 55-59. Further, from our national survey of changes in retirement intentions we will assess the likelihood of individuals changing their retirement plans in light of the recent (July 1, 2007) tax reforms.

The extent to which people continue to work after the early retirement age is closely related to the second key feature of retirement plan provisions, the pattern of benefit accrual. Suppose that at a given age a , a person has acquired an entitlement to future benefits upon retirement. The present discounted value of these benefits is the person's social security wealth at age a , which is labeled SSW_a . The key consideration for retirement decisions is how this wealth will evolve with continued work. If a person is aged 59 years, for example, what is the change in SSW if he/she retires at age 60 instead of age 59? The difference between SSW if retirement is at age a and SSW if retirement is at age $a+1$: $SSW_{a+1} - SSW_a$, is called the SSW accrual. We compare the SSW accrual to net wage earnings over the year after the retirement date. If the accrual is positive it adds to total compensation from working the additional years; if the accrual is negative, it reduces total compensation. More details about this ratio are

provided in the following paragraphs where it is defined as an implicit tax on earnings from continuing work for one more year in preference to retirement at the given age.

3.(c) *A model of the implicit tax on superannuation retirement benefit*

The following model is a modified version of one developed by Gruber and Wise (1999). The modifications are dictated by the availability of suitable Australian data, these are indicated as the model unfolds.

The theoretical basis for the model developed in the following paragraphs is described by Diamond and Gruber (1999, pages 454-456). In essence, individuals nearing or at the retirement age make the customary leisure versus future income choice. Leisure is manifest in the decision to retire and live on superannuation benefits and is traded off against income derived from additional work. The bias which may emerge in favour of early retirement is manifest in a loss of social security wealth associated with an additional year's work causing a disincentive to additional work.

An individual's social security wealth evaluated at age a_0 and retirement age r [$SSW(a_0, r)$] is composed of the present value at age a_0 of future social security benefits if retirement occurs at age r [$PB(a)$] minus the present value of social security contributions at age a_0 until retirement at age r [$SSC(a_0, r)$]:

$$SSW(a_0, r) = PB(a_0, r) - SSC(a_0, r) \quad (1)$$

This is a simplified version of the model developed by Gruber and Wise (1999). They add to $SSW(a_0, r)$ the present value of survivor benefits at age a_0 if a worker dies. We were unable to observe the amount of survivor benefits at spouse's age from Australia, data thus our

calculation refers to *SSW* accrued by the individual without considering survivor benefits. Not all retirees have survivor benefits either because their superannuation entitlements do not provide for these, or because they have no surviving beneficiaries.

$PB(a_0, r)$ is defined in the following manner:

$$PB(a_0, r) = \sum_{a=r}^{a=\max} P(a)B(a) \frac{1}{(1+\rho)^{a-a_0}} \quad (2)$$

The pension benefit is summed from the date of retirement through to the maximum age in Australia of 85 years². $P(a)$ is the probability of worker's survival at age a conditional on survival at age a_0 ³. $B(a)$ is the amount of retirement benefit at age a , conditional on retirement at age r . The discount rate for this calculation is $\rho = 0.03$ p.a., a proxy value for the real rate of interest and $a - a_0$ is the discount interval. This discount rate is applied in the simulations conducted by the eleven individual economic researchers involved in the Gruber and Wise (1999) study. We adopt the same discount rate for purposes of comparison.

$SSW(a_0, r)$ is defined in terms of the discounted social security payments ($C(a)$) made by the individual as follows:

$$SSC(a_0, r) = \sum_{a=a_0}^{a=r-1} P(a)C(a) \frac{1}{(1+\rho)^{a-a_0}} \quad (3)$$

The accrual of social security wealth is the change in *SSW* between two years and is written:

$$\Delta SSW_{a+1} = SSW_{a+1} - SSW_a \quad (4)$$

The wealth accrual is the change in *SSW* occurring at age $a+1$ minus the value of *SSW* at age a . This is a net benefit loss if the accrual is negative and a gain if positive. From this

² The selection of a maximum age of 85 years is based on advice provided by the Australian Bureau of Statistics and is only marginally greater than the weighted average of the male and female life expectancy.

³ $P(a)$ is calculated from the Life Tables, ABS 2302.0.55.001, 2002-04.

definition of wealth accrual we can calculate the implicit tax rate on working one additional year. This is the accrual divided by the individual's earning in the year of additional work:

$$Tax / Subsidy = -\Delta SSW_{a+1} / Earning(a+1) \quad (5)$$

If this implicit tax on additional earnings is positive, then the extra year's work is deemed to be taxed, and if negative then the individual's additional year of work is subsidized. Our task is to determine if early retirement is subsidized and later retirement is taxed. Note in (5) that a tax applies if ΔSSW_{a+1} is negative and a subsidy applies if this term is positive. Negative values on Table 1 and 2 indicate the rate of subsidy paid and positive values denote the implicit rate of tax on earnings beyond retirement.

3.(d) *Measurement of variables and simulation method*

The task of developing a suitable data set is demanding and requires a substantial explanation. Data for an individual's Social Security Wealth at age a involves the measurement of after tax benefit, $B(a)$ in expression (2). These benefits include the age pension and superannuation entitlements and are obtained from ABS data for individuals for different ages: $a_0=49$ years of age up to the pre-specified maximum age of 85 years. Thus the measurement of benefits $B(a)$ includes both the after tax retirement age pension entitlements and after tax superannuation benefits. The effect of the tax regime prevailing prior to July 1 2007 in creating an early retirement bias is represented by the effects of the pre July 07 tax regime on after tax benefits. A reduction of the tax burden on benefits will boost the values of after tax benefits. The probability of individuals surviving to age a , $P(a)$ is calculated from the Australian life table (ABS 2302.0.55.001 2002-04) and the calculation of $P(a)$ is conditional on

the probability of the individual reaching earlier ages. Social Security Contributions are largely represented by superannuation contributions but these are not available by age, so a different approach is adopted. This involves the calculation of the following ratio: Total Superannuation Contributions in dollars/ Total Australian after tax earnings in dollars. Both values are available in ABS 6348.0, 2003 table 1(a). The outcome of this calculation is the proportion 8.78 which indicates that on average for all ages 8.78 percent of after tax income is contributed to superannuation. Superannuation contributions at each age (a) are determined by applying this proportion to average annual after tax earnings at each age (a). After tax earnings data are drawn from the publication ABS 6523.0 for 2003/04. The average income for each age group is used as an approximation for each age within the group.

The model described by expressions (1) to (5) is calculated, first, for a base case involving a single person household. The result of these calculations is shown on table 1. A second set of calculations for married couples is also conducted and the results are shown on Table 2.

The outcome of this simulation exercise is a tax/subsidy rate, which indicates the absolute change in social security wealth (accrual) as a ratio of the potential earnings from working one more year assuming people retired at age 60 if they are younger than 60 years of age when assessed. This represents the implicit tax on, or subsidy to, continued work in terms of the net change in social security wealth implied by the additional years work. The numerator of this tax/subsidy rate is the opposite of the change in social security wealth from working the additional year. The denominator is the potential earnings over the additional year. Thus, if the ratio in (5) is positive, the social security system is assumed to cause a disincentive to additional work through foregone social security wealth. This is the relevant concept for the

worker who is trading off leisure against continued work.

For the purposes of simulation, we assume that workers claim social security benefits either at the point of their retirement or when they become eligible if they retire before the point of eligibility. To produce the base-case numbers, we use a typical single individual or the couple household head born in January 1943 and who turned sixty in January 2003. In theory, to calculate benefits for a worker, we would need his/her entire earnings history. Because the HILDA survey is conducted from 2001 only, we use social security benefits across all ages in one year (2003) to represent a single person and a couple's entire benefit receiving history. To be consistent, the average earnings and salary across all ages for year 2003 are collected from ABS (2003-04) to represent a single person and a couple's entire earning history.⁴

The calculations for a couple are more complicated. They include benefits for the surviving spouse, weighted by the survival probability of the spouse. Due to the difficulty of obtaining data on widows pensions, we simplify the case to assume that a male worker's wife will survive to a given age enabling us to use data from HILDA (2003). A "couple family" here includes all types of couple families with or without dependent or independent children. In practice, we use a static earning history, which is the median earnings of the single person over different ages in one single year 2003.

3.(e) *Incentive computations*

Table 1 shows our single worker results. Each row represents the age of a worker in the last year that he or she worked. Recalling our inability to disaggregate these data by sex, he/she is

⁴ Preferably, we use the median earnings and benefit entitlement of a sixty year old in 2003 (the last available year of data) as our base point and then follow this cohort back through time (using the median benefits for age fifty nine in 2002, age fifty

entitled to social security benefit when he/she reaches the age of sixty. Over age 59, the accrual rate fluctuates between -1 percent and -7 percent. The implicit tax imposed on single workers is quite high as shown on the table. The implicit tax on working beyond age 59 is positive, 40 percent at age 60, rising to a maximum of 101 percent at age 65. Note also that a subsidy applies to workers age 59 years or less, and peaks at this age (59 years).

Table 1 Single person incentive calculations

Last Year of Work	Social Security Wealth	Accrual	Accrual Rate	Tax/Subsidy
49	210,127	0	0.00	0.00
50	216,575	6,448	0.03	-0.19
51	226,837	10,262	0.05	-0.31
52	237,494	10,657	0.05	-0.32
53	248,574	11,080	0.05	-0.33
54	260,111	11,536	0.05	-0.35
55	272,143	12,033	0.05	-0.43
56	284,184	12,040	0.04	-0.43
57	296,907	12,723	0.04	-0.45
58	310,268	13,361	0.05	-0.48
59	324,338	14,071	0.05	-0.66
60	315,869	-8,470	-0.03	0.40
61	314,136	-1,733	-0.01	0.08
62	311,905	-2,231	-0.01	0.11
63	291,483	-20,422	-0.07	0.96
64	273,457	-18,026	-0.06	0.85
65	252,033	-21,424	-0.08	1.01
66	235,927	-16,106	-0.06	0.83
67	223,830	-12,097	-0.05	0.63
68	212,678	-11,152	-0.05	0.58
69	198,750	-13,928	-0.07	0.72

Note: Social Security Wealth and Accrual are in Australian Dollars.

Table 2 explores the same issues for a married (male) worker assuming his wife is not entitled to any social security benefit. Thus, above age fifty five, tax rates are generally higher for single than married workers. However in both cases, the pension accrual is typically negative at older ages. Continuation in the labour force means a loss in pension benefits, which imposes an implicit tax on work and provides an incentive to leave the labour force. Again at

eight in 2001 and so on until age forty in 1983). 2002, age fifty eight in 2001 and so on until age forty in 1983).

age 60 the implicit tax on a married worker is 77 percent. This rises rapidly to a maximum of 104 percent at age 66 for married workers and declines past age 66.

Table 2 Couple family incentive calculations

Last Year of Work	Social Security Wealth	Accrual	Accrual Rate	Tax/Subsidy
49	231,012	0	0.00	0.00
50	242,481	11,469	0.05	-0.32
51	253,874	11,393	0.05	-0.32
52	265,706	11,831	0.05	-0.33
53	278,007	12,302	0.05	-0.34
54	290,044	12,037	0.04	-0.33
55	304,177	14,133	0.05	-0.43
56	317,843	13,667	0.04	-0.42
57	332,163	14,319	0.05	-0.44
58	347,197	15,034	0.05	-0.46
59	363,008	15,811	0.05	-0.53
60	339,898	-23,110	-0.06	0.77
61	322,046	-17,852	-0.05	0.60
62	308,123	-13,923	-0.04	0.46
63	294,023	-14,100	-0.05	0.47
64	284,568	-9,455	-0.03	0.32
65	271,452	-13,116	-0.05	0.44
66	244,080	-27,372	-0.10	1.04
67	226,491	-17,589	-0.07	0.67
68	207,898	-18,592	-0.08	0.70
69	194,770	-13,128	-0.06	0.50

Note: Social Security Wealth and Accrual are in Australian Dollars.

How does Australia stand in an international comparison of the implicit tax rate on work at age 60 under the pre July 1 2007 superannuation tax rules? The answer to this question is provided in a comparison of the implicit tax rates on further work at age 60 with implicit tax rates elsewhere. In Australia, the implicit tax rate at age 60 is 40 percent for single persons and 77 percent for couple families. By way of contrast, Gruber and Wise (1999) find the implicit tax on earnings from one extra year's work to be 82 percent (Belgium), 80 percent (France), 141 percent (Netherlands), 75 percent (UK), 35 percent (Germany), -23 percent (Spain), 8 percent (Canada), -1 percent (United States), 28 percent (Sweden) and 47 percent (Japan). The average implicit tax on one year's additional work in these cases is 47.2 percent, so Australia's

40 percent for single workers is slightly below this average. Note that comparison ignores all changes in retirement tax policy in these 11 countries since 1999 and predates the Australian tax reforms introduced on July 1, 2007.

4. The potential response to tax reform

Several references are made in the Treasurer's budget speech for 2006/07 to the importance of encouraging older workers to stay longer at work. This is the prevailing wisdom underpinning retirement policy in Australia and elsewhere. If this is true then the identified bias favouring early retirement is inconsistent with the intent of policy. The main features of the tax reforms announced in May 2006 and effective from July 1 2007 namely, removal of the tax on end superannuation benefits and of the RBL mechanism may help counter this bias by increasing the after tax social security wealth of individuals aged 60 years and over. From expression (5) this increased social security benefit from age a years to $a+1$ years reduces the tax on retirement benefits given the flow of earnings for an additional year's work. It is one thing for a government to offer an incentive for individuals to stay at work and another altogether for them to respond to this incentive. So how will individual baby boomers respond to these tax reforms? Will they respond by working beyond 60 years of age, or even 65 years of age.

New research explaining potential responses of individuals to end benefits tax reform are contained in the outcomes of a national survey commissioned by the three authors of this paper. This survey of 2500 Australian households is described as the Australian Survey of Retirement

Attitudes and Motivations (ASRAM)⁵ and involved phone interviews with 2500 Australian households and workers aged 40 to 59 years (essentially the Baby Boom generation). They were questioned about retirement attitudes and intentions with a particular focus on factors that might extend or shorten an individual's working life.

We determined the effects of end benefits tax reform on retirement intentions by cross tabulating the answers to question 34(a) with answers to questions 25Ro2 and 25Ro1. This allows the likelihood (as a relative frequency) of individuals revising their retirement intentions to work beyond 60 years of age (qu. 34a). It also allows us to identify the source of retirement income: private superannuation (qu. 25 Ro2), government pension (25 Ro1) or other social security benefit and investment income of various types. We are also able to distinguish superannuation and pension benefits as a major or a minor source of retirement income. The proportions (percentages) of sampled responses associated with the likelihoods of individuals working beyond 60 years of age are distinguished by their likelihood. Respondents were asked if they were "very likely", "likely", "unlikely", "very unlikely" to work beyond 60 years of age as a result of the July 07 tax reforms. Some answered by declaring the issue not relevant to them because they plan to work beyond 60 years of age in any eventuality and a tiny proportion of the sample were not aware of the end benefit superannuation reforms. These likelihood categories, plus the not relevant and unaware answers account for 100 percent of 2264 and 2212 valid responses of potential superannuants and pensioners respectively.

The Chi-square test statistics shown at the foot of Table 3 indicate that there is a significant difference between the cross tabulation results of the groups involved in this study.

⁵ Commissioned by the authors as part of ARC Discovery Grant No. DPO557922

Table 3: The Likelihood of Australian Baby Boomers delaying retirement beyond age 60 years following tax reduction

Likelihood	Superannuation Income			Government Pension Income		
	Major %	Minor %	Total %	Major %	Minor %	Total %
Very Likely	19.95	16.86	18.46	17.59	19.09	18.37
Likely	32.94	28.51	31.45	30.99	34.65	31.47
Unlikely	25.86	29.07	26.55	24.46	26.76	26.82
Very Unlikely	11.89	12.78	12.63	12.40	10.40	12.64
Not Relevant	8.18	11.52	9.72	13.23	7.58	9.57
Unaware	1.18	1.26	1.19	1.33	1.52	11.13
	100.00	100.00	100.00	100.00	100.00	100.00

Sample Details

Sample	Superannuation		Government Pension	
	Valid Responses	% Valid	Valid Responses	% Valid
2500	2264	90.6	2212	88.40

χ^2 tests

	Superannuation			Government Pension		
	Value	df	Asy. Significance	Value	df	Asy. Significance
Pearson Chi-square	39.298	10	0.000	39.126	10	0.000
Likelihood Ratio	37.608	10	0.000	36.631	10	0.000
Linear Association	24.952	1	0.000	0.227	1	0.634

The sample survey results recorded on Table 3 suggest that of those who regard private superannuation as their major source of income 19.95 and 32.94 percent are very likely and

likely, respectively, to work beyond 60 years of age in response to these tax reforms. In other words, 52.89 per cent of those surveyed are either likely or very likely to change retirement plans and work beyond 60 years of age. This compares with 25.86 and 11.89 percent who are “unlikely” or “very likely” to change retirement plans. If superannuation constitutes a minor source of retirement income, then 16.86 (very likely) and 28.51 percent are likely to work beyond 60 years of age compared with the 42 percent who are unlikely or very unlikely to change their plans. A similar description applies to Government pension benefits: 45.37 percent of those dependent upon a government pension are either very likely or likely to alter their retirement plan and work beyond 60 years of age as a result of the tax reforms. This outweighs the proportion whom are unlikely or very unlikely to change their retirement plan (36.86%).

A further dimension is added to the analysis by cross tabulating answers to question 25 Ro1 and Ro2 about the sources of retirement income with answers to question 38 which involves identification of those who would contemplate working beyond 65 years of age in response to the end benefits tax reform. This analysis applies only to those accumulating retirement benefits from private superannuation, or those seeking government pensions in retirement and not other sources of retirement income such as investments. The valid responses (2227) constitute 89 percent of the total sample of 2500 while the statistical properties from cross tabulation are evident in the Chi-square Tests at the foot of Table 4 revealing that differences between the cross tabulation results of groups involved in this study are significant.

The results again support the view that individuals will respond to the end benefit tax reforms. For those who regard superannuation as a major retirement income source 39.22 and

14.36 percent are very likely or likely to work beyond 65. Thus 53 percent of valid responses indicate that they are very likely or likely to work beyond 65 which is more than the 27.63 percent who are very unlikely or unlikely to work beyond 65 years of age. The same results apply to those who view superannuation as a minor component of retirement income: 54.6 percent are very likely or likely to work beyond 65 while 27.69 percent are unlikely or very unlikely to do so. In total, 52.83 percent are very likely/likely to work beyond 65, while only 28.05 percent are unlikely/very unlikely to work beyond 65 years of age.

Table 4: Likelihood of Australian Baby Boomers working beyond 65 years of age in response to end benefit tax reform

Likelihood	Major%	Minor %	Total %
Very Likely	39.22	31.54	34.32
Likely	14.36	23.08	18.51
Unlikely	19.34	18.46	18.80
Very Unlikely	8.29	9.23	9.25
Not Relevant	16.57	16.92	17.63
Unaware	2.22	0.77	1.49
	100.00	100.00	100.00

Sample Details

Sample	Valid Responses	% Valid
2500	2227	89.08

Chi-Square Tests

Statistic	Value	Df	Asym. Significance
Pearson Chi-Square	250.84	15	0.000
Likelihood Ratio	230.23	15	0.000
Linear by Linear Association	15.28	1	0.000

5. *Conclusion and policy implications*

The major finding of this study is that biases in the Australian taxation system pre July 2007 favoured early retirement. The implicit tax on continuing work was negative for the age groups 49 to 59 suggesting that early retirement was encouraged by the taxation system as it existed prior to July 2007. The same outcome applies to married workers where the implicit tax on further work is also negative. The only discernible difference between single and married workers is that a higher subsidy is paid to single workers. The average subsidy to single workers (12 percent p.a.) is smaller than the average subsidy paid to married workers (11 percent p.a.). However above age 59 both single and married workers are taxed on work performed for each year beyond the retirement age. Thus the Australian taxation system as it existed prior to July 2007 was biased against continuing to work beyond age 59.

This bias is explained in part by legal structures in some cases and by the ideological climate prevailing in the labour market in the 1990s. A good example of legal effects is the so called 54/11 'problem' applying to Australian federal public servants. Laws pertaining to retirement and the Commonwealth Government's public service pension scheme mean that retirement benefits are maximised at 54 years and 11 months and the costs to individual workers retiring beyond that age are penal in nature. Other examples will surely be found. In

relation to the 1990s, this was an era in which downsizing and early retirement were almost a *cause celebre* and in some respects engendered by an IT revolution in which there was a mismatch between a previous skills generation and the job requirements of the IT age. Many mismatched workers took voluntary redundancies or were involuntarily retired by employees in a downsizing process commensurate with the needs of a new IT technological epoch in work patterns.

The policy paradigm has shifted again as skill shortages have become evident in many sectors of the Australian economy and encouragement for skilled workers to stay at work at older ages is becoming an imperative. One way of achieving this outcome is to reduce the tax burden on superannuation retirement benefits, as signalled by the Australian government in the 2006-07 federal budget. Lump sum and pension payments will no longer be taxed at the point of exit. This applies to all taxed superannuation benefits regardless of the age at which retirement occurs. The precise effect of this tax exemption cannot be determined until after the new system is implemented on 1st July 2007. The likely effect is that all of the implicit tax rates shown on tables 1 and 2 will fall and it is conceivable that some of the positive implicit tax rates at and beyond age 60 will become negative, although this is not guaranteed. However, this tax exemption will apply to all superannuation payouts, particularly those occurring at ages 55 to 59; thus the effect in these cases will be to make the implicit tax on retirement at these ages even more negative. The removal of the 15 percent tax on all but untaxed funds may not disturb the balance between early retirement and continued work. The government has addressed this imbalance by confining tax exempt status for those aged 60 and above upon retirement might be fully exempt from the exit tax on their funds.

The removal of the Reasonable Benefits Limits (RBL) announced in the 2006-07 budget will affect the retirement decisions of wealthier employees; those entitled to lump sums exceeding \$600,000 in value or a stream of pension entitlements exceeding 1.1 million dollars. The excess (above RBL) entitlements have previously been taxed at the normal marginal rate. Now wealthier retirees can access their funds at a nil exit rate regardless of the size of their benefit. Further research is called for on these issues, although this extended research agenda must await the 12 month consultation period which applies prior to the policy implementation date of 1st July 2007. There are several additional changes to superannuation concessions, particularly limits and entitlements to be finalised following consultations by the government with the superannuation industry.

A survey of Australian households to determine their retirement intentions was commissioned by the authors of this paper. By cross tabulating answers to questions about the sources of retirement funding for individuals with the questions about reactions to the tax reforms announced in the 2006/07 federal budget, we were able to assess the probabilities of people staying at work longer following these reforms. Of particular interest is the policy change removing taxation from end-benefits beyond July 2007. This primary research reveals that 50 percent of the 2264 individuals sampled in the 40-59 years age group say they are likely or very likely to use the policy to extend their work tenure beyond 60 years of age. Thus policy makers can expect important economic effects to follow these reforms. In particular, one can expect substantial effects on the rate of exit from the workforce; on unemployment and employment, and on the magnitude and pattern of aggregate consumption. An extensive further research agenda is evident in relation to the effects of the July 1, 2007 tax reforms.

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