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POPULATION AGEING, TAXATION, PENSIONS AND HEALTH COSTS

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Abstract

This paper argues against the policy position that begins with a doomsday scenario of publicly provided health insurance and pension systems threatened with collapse under the stresses imposed by population ageing, and instead contends that the threat of crisis in these systems is policy driven. The central thesis of the paper is that a range of policies lead to the creation of an ageing crisis by inhibiting the efficient reallocation of female labour from the home to the market in response to the decline in fertility. The analysis focuses on family support policies that create large effective tax burdens on female labour supply, by means testing the support on family income, or selectively on the second income. Examples include Family Tax Benefit Part A and Part B, the Medicare Levy and the Medicare Safety Net. The analysis draws on household survey data to show that female labour supply is strongly positively associated with household saving, the purchase of private health insurance and spending on family health generally. Policies that inhibit female labour supply therefore have the effect of reducing the tax base for funding public pensions and health care, while simultaneously reducing the capacity of families to fund them privately.

JEL: D19, H13, I18, J26
Keywords: life cycle, health costs, pensions, household taxation

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1 Introduction

This paper examines the question of how to deal with the consequences of population ageing resulting from a large decline in fertility, coupled with significant advances in the technology of medical care, that Australia in common with all other developed countries has experienced over the last four or five decades. Population ageing necessarily increases the Aged Dependency Ratio (ADR), the number of retirees per person of working age, while the advances in medical technology, in making available major improvements in the scope and quality of medical care, have increased *per capita* health care costs. Since the aged have an above average demand for health services, the combined effect appears to be an increasing strain on the ability of the working generation to finance pensions and health services for the aged. The Australian Government has produced two reports, Intergenerational Report 2002-03 (IGR1) and Intergenerational Report 2007 (IGR2) that highlight the rising burden on future working-age generations of the projected rise in the ADR over the next four decades.[1]

The proposed solutions focus on privatisation. The policy response to the rising cost of pensions has centred on measures to increase contributions to superannuation, with the aim of partially replacing reliance on the non-contributory, income-tested Pay-As-You-Go (PAYG) aged pension by private saving for retirement as the ADR rises. There has also been strong support for the expansion of private health insurance and private provision of hospital services. These solutions tend to be presented as self-evidently essential, without discussion of the fundamental issues concerning insurance market failure, transactions costs and the social allocation of risk, that are important reasons for the existence of the publicly funded systems they are intended to replace.

This paper first presents in Section 2 an alternative perspective on the economic effects of population ageing. The remainder of the paper then argues that not only is the economic case for privatisation of pensions and the relevant insurance systems unsubstantiated, but there are alternative policies aimed at the system of income

[1] See Australian Government (2002, 2007).

taxation and transfers that address the problem at its roots, and offer a more effective and less costly solution.

2 Population ageing and dependency costs

Though increasing longevity has been a contributing factor, the primary cause of the increasing ADR has been the large decline in fertility since the early 1960's. In 1961 the Total Fertility Rate (TFR) in Australia was 3.5. By 1980 this had fallen to 1.9, and since that time it has tended to level out at 1.7 to 1.8. It is projected to remain at around this level for the next 40 years. IGR2 dramatically portrays the effects of this by pointing out that "In 2007 there are 5 people of working age to support every person aged 65 and over. By 2047, there will only be 2.4 people of working age supporting each person aged 65 and over".

Why might the drama be misplaced? First, it is misleading to focus purely on the ADR when declining fertility is the major cause of population ageing. What is important is the Total Dependency Ratio (TDR), the ratio of the *total* non-working to the working age population. This is influenced by the child-to-working-age ratio, or Child Dependency Ratio (CDR), and of course declining fertility reduces this. The TDR can therefore be falling as the ADR is rising. This has in fact been the general trend since 1961. The projected levelling out of the fertility rate at its current level will cause the TDR to rise, with the result that the TDR will tend to exhibit a U-shaped profile over the period from 1961 to 2047. Since the minimum point in the profile is around the present time, a continuing rise in the TDR is projected for the next 40 years due, as stated in IGR2, to a fall in the traditional working age category (15-64 years of age) from its current 2007 level of 67.5 per cent of the total population to around 60 per cent by 2047, and a rise in the ADR that is greater in absolute value than the fall in the CDR. However, the projected TDR for 2047 is close to the rate for 1961, which did not appear to cause the collapse of civilisation as we know it.[2]

[2] It should also be pointed out that with productivity growth in the historically experienced range of 1%-2% per annum, over 40 years the average worker's productivity increases by between 50%-120%, and so productivity growth alone can be expected to continue to make a significant contribution to raising output per capita. See Cutler et al. (1990).

Secondly, declining fertility and population ageing need not imply an increase in the *resource costs* associated with an increasing TDR. If the cost to the economy of a child is greater than that of a retiree, the overall costs of dependency can be falling even when the TDR is constant or rising, because of the changes in its composition. In developed economies children are very costly. All need full time care for at least some years and, depending on training and education choices, some may not enter the labour market for at least two decades.[3] On the other hand it might be argued that the health care costs associated with ageing and greater longevity make retirees more costly than children. Recent research in health economics however has shown that neither the direct nor indirect effects of ageing can account for much of the sustained rise in medical expenditure in recent decades. A number of studies argue that the growth rates of health spending are driven primarily by rising per capita income.[4] Others focus on the contribution of improvements in medical technology.[5] These take the form of innovations that increase the number and types of health problems capable of successful treatment, and so have the effect of increasing the demand for and costs of medical care. However, it is something of a paradox that technological innovations which offer the possibility of curing sickness and saving lives should be regarded as a problematic rather than beneficial development.[6] What may make them so is a failure of policy in the health care sector to solve the problem of structuring the health insurance system appropriately.

Finally, and most fundamentally, the question arises of what happens to the resources released by the falling fertility rate. Dramatizing the gap (in terms of absolute values) between the ADR and CDR from the present time to 2047 is open to the objection that it distracts attention from the resource implications of the reverse relationship that held from 1961 to the present time. Given the evidence that, on average, a child is

[3] This point is highlighted by Barro and Becker (1989). For an analysis using Australian data, see Apps and Rees (2002).
[4] See Hall and Jones (2007), Cutler and McClellan (2001) and Cutler et al. (2006).
[5] See Newhouse (1992). The invention of new technologies may however be endogenous, as argued in Hall and Jones (2007).
[6] The view contrasts with the modelling of health expenditure as investment in human capital. Barro (1996) argues that medical advances have made an important contribution to sustaining a long-term positive growth rate. See also Nordhaus (2003) and Becker et al (2005) who conclude that increases in longevity have contributed almost as much to welfare as increases in non-health consumption in the US and worldwide.

more costly than a retiree,[7] the period from 1961 to 2007 should have seen a significant rise in output per capita due to demographic change alone. Thus, the lower TDR over this period should have provided the resources necessary to offset any fall in output per capita up to 2047. In other words, the period should have seen additional saving and higher tax receipts from a larger tax base as sources of finance for productivity-improving investments, such as in education, health and infrastructure. Provided the resources released by a declining fertility rate have been used for these purposes, there can be no reason to anticipate an "ageing crisis" with the leveling out of the fertility rate to 2047.[8]

The central thesis of this paper is that a range of government policies have led to the creation of a potential ageing crisis by inhibiting the efficient reallocation of female labour from the home to the market as fertility has declined.[9] Our analysis focuses on family support policies that create large effective tax burdens on female labour supply by means testing the support on family income, and on the second income. Examples include Family Tax Benefit Part A and Part B, the Medicare Levy and the Medicare Safety Net under which benefits depend on eligibility for Family Tax Benefit Part A.

In the following section we show how policies of this kind, in combination with a poorly developed and costly childcare system, make it very difficult for married women to work in the market when they have young children. In Section 4 we go on to present evidence of a negative impact on female labour supply across the lifecycle. We then show that there is a strong positive relationship between female labour supply, household saving, the purchase of private health insurance and private spending on health generally. Thus, on the one hand the government provides subsidies to encourage saving for retirement and the purchase of private health insurance and, on the other, puts in place a tax and family support system that has strong negative effects on both. The section provides a brief critique of these policies, and of the move towards privatisation. A concluding comment is contained in Section 5.

[7] For an analysis of child costs in a lifecycle framework, see Apps and Rees (2003).
[8] If fertility rises significantly, then of course the cost of dependency per working-aged individual could rise significantly.
[9] It is also of interest to note that a number of studies argue that policies that have a negative effect on female labour also reduce fertility.

3 Taxes, family support and income tests

Australia is widely viewed as having a progressive tax on individual incomes. However, the rate schedule of a country's income tax system is set not solely by the schedule of rates applying to personal income but also by the design of income tests for benefits, exemptions, credits and offsets. The focus of the analysis here is on the high rates of tax faced by married women as second earners under a system of *effective* joint taxation, introduced by targeting the Medicare Levy (ML) exemption and Family Tax Benefit Part A (FTB-A) on the basis of joint income, and the withdrawal of Family Tax Benefit Part B (FTB-B) on the income of the second earner. The Medicare Safety Net, which is linked to FTB-A, is also at fault. The section first explains the structure of tax rates created by these policy instruments based on hypothetical cases, and then goes on to present an empirical analysis of the impact on families using household survey data.

3.1 Structures of tax rates

We compare two hypothetical families, the first with one partner in full time work and the second with both partners in full time work, to show how the above policy measures set high rates on the income of a second earner. For convenience, we label the single-earner household "H1" and the two-earner household, "H2". Each household is assumed to have two children, one aged under 5 and the other under 13 years, and to decide first on the primary earner's labour supply and then to choose the labour supply of the second partner. The male partner is taken to be the primary earner. All adults face the same gross wage and have zero non-labour incomes. Under these assumptions the two households have the same primary incomes, but the H1 household has only half the joint income of the H2 household because the female partner in H1 has chosen to specialise in the home production of childcare and related services rather than in market work.

Figure 1a plots the profile of marginal tax rates (MTRs) that apply to the income of the primary earner in each household when the 2006-07 schedule of MTRs on

personal income is combined with the Low Income Tax Offset (LITO). The LITO has the effect of raising the zero rated threshold of the personal income tax rate schedule from $6000 to $10,000 and the MTR on income from $25,001 to $40,000 from 30 cents to 34 cents in the dollar. [10] Because the tax base is still individual income and the partners in the H2 household earn the same incomes, the graph shows a single MTR profile for both partners in the H2 household.

Figure 1a MTR schedule + LITO

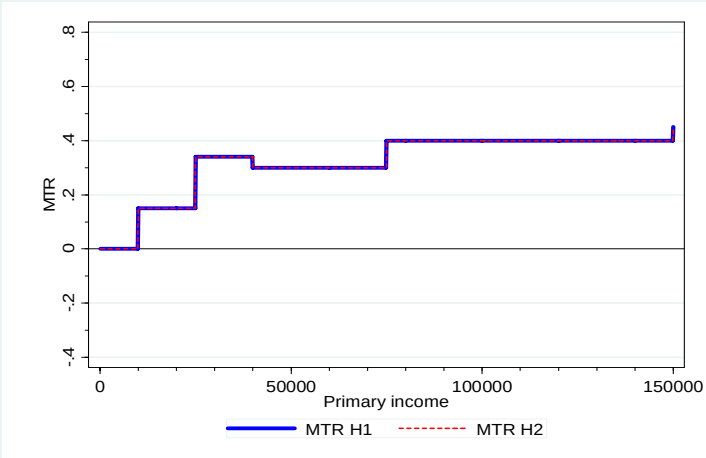


Figure 1b ATRs: MTR schedule + LITO

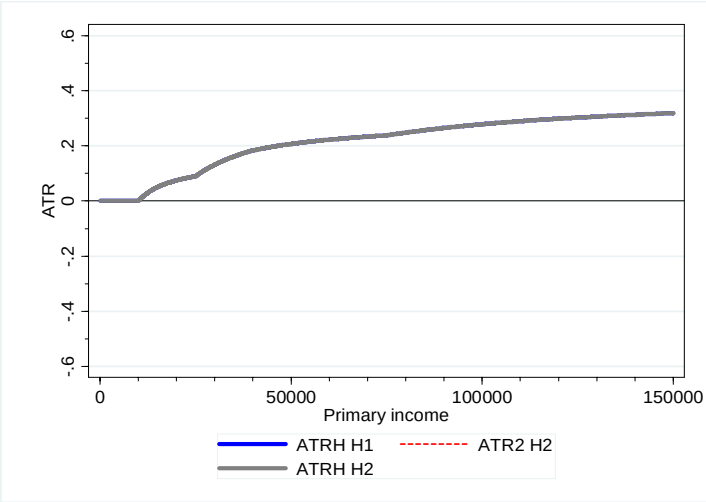


Figure 1b plots the ATR profile. Again, there is a single profile because the tax base is individual income. Note, however, that both members of the H2 household pay tax, and so at any given level of primary income, the household pays twice as much tax as

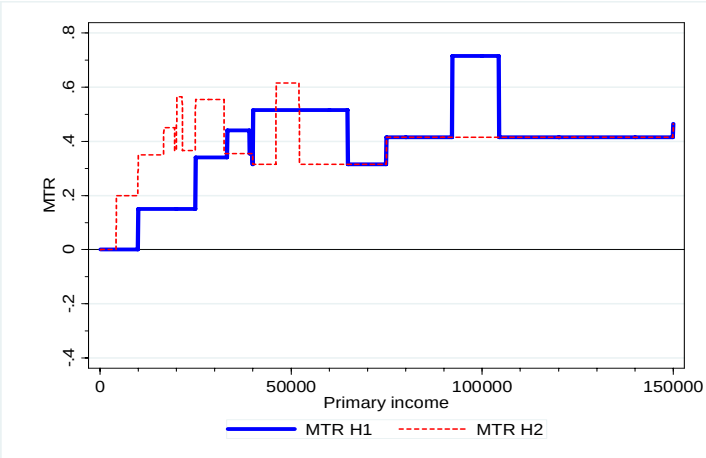
[10] The LITO is in fact an entirely redundant policy instrument that serves only to reduce the transparency of the true MTR schedule, with a rate of 34 cents in the dollar on incomes from $25,001 to $40,000, depicted in Figure 1.

H1. In effect, the H1 household avoids tax on a second income by having one parent working in untaxed home production rather than in taxed market work.[11]

Figures 2a and 2b show what happens when the ML and FTBs are included. The MTR and ATR profiles change dramatically. There is now a large gap between the MTR profiles for H1 and H2, created by higher marginal rates on the second income up to the point where the base rate of FTB-A has been entirely withdrawn on joint income. In Figure 2b the resulting ATR on the income of the second earner, ATR2, is well above that on the income of the primary earner, and therefore on the income of the single-earner household, ATRH H1, up to around the upper income limit of $104,317 for the base rate of FTB-A, for H1. As a result the ATR profile for the two-earner household, ATRH H2, is well above that for the single-earner household, ATRH H1, up to this point.

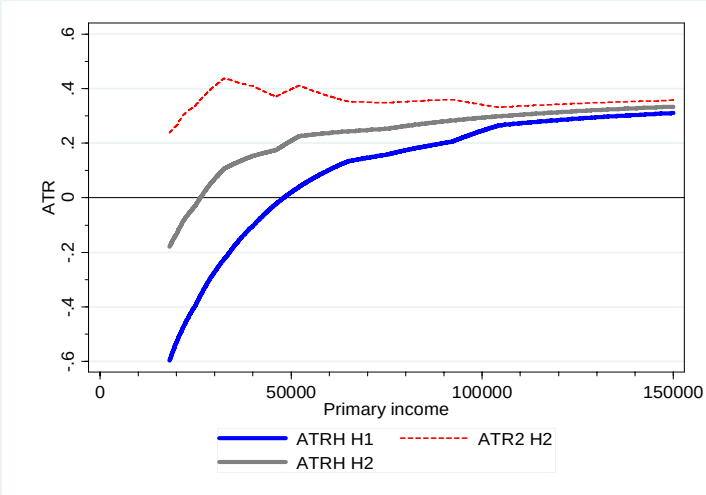
A gap of this kind between primary and second earner ATR profiles is a characteristic feature of joint taxation. Under a system of full joint taxation or, equivalently, income splitting, the second earner faces on the first dollar earned the MTR on the primary earner's last dollar. And because she faces a higher MTR on every dollar she earns, she has a higher ATR. The withdrawal of FTBs on joint income and the income of the second earner has the same effect up to the primary income level at which the H1 household has entirely lost FTB-A.

Figure 2a MTR schedule + LITO + ML + FTBs



[11] If tax revenue is used to finance a universal benefit for each family, then, at any give level of primary income, the H2 household contributes more to the revenue cost of the benefit and therefore effectively finances a subsidy for the H1 household by working longer hours in the market.

Figure 2b ATRs: MTR schedule + LITO + ML + FTBs



The effective tax rate on the second earner at this income level can be even higher, due to the Medicare Safety Net thresholds. For eligible services outside hospital, Medicare pays 80 per cent of the out-of-pocket (OOP) costs above a family threshold of $519.50. For families not in receipt of FTB-A, the threshold rises to $1039.00.[12] The second earner in the H2 household on $52,200, a figure slightly below average weekly earnings (AWE), can therefore lose an additional 80 per cent of the increment in the threshold, that is, of $519.50, depending on the family's OOP costs.[13]

3.2 Impact on families

We use data for a sample of 1945 "in-work" couple income units drawn from the Australian Bureau of Statistics (ABS) Income and Housing Survey (IHS) (2003-04)[14] to examine the overall impact of the system on families. The sample is selected on the criteria that the couple income unit has dependent children and at least one parent is employed. Families in which both parents are unemployed or out of the workforce are excluded in order to focus on the income tax and FTB system, rather than on the wider welfare system. This excludes very few records.[15] The sample is also limited to

[12] These were the thresholds for 2006-07.
[13] The findings of a study by Van Gool et al. (2006) indicate that the Medicare Safety Net my have led to an increase in provider fees. This would result in further losses in the net income of families at this income level.
[14] Second edition.
[15] Of male partners in the full sample of families, 83.6 per cent are in full time work, 6.7 per cent are in part-time work and 2.5 per cent are unemployed. 27.9 per cent of married mothers are in full time employment. 37.6 per cent are in part time work and 2.3 per cent report being unemployed. Only a quarter of one per cent of families reports both parents as unemployed.

families in which at least one parent earns above $15,000 per annum, earnings are principally from wages and salaries, and neither parent has a negative income from investments or unincorporated enterprises. The parent with the higher private income is treated as the primary earner.[16] The male partner is the primary earner in over 87 per cent of records. All incomes are indexed to the 2006-07 financial year.

Given the assumption that the household decides first on the primary earner's labour supply and then chooses the labour supply of the second partner, the tax burden on the primary earner can be calculated as the tax the family would pay if it had only one earner, that is, if the second earner withdrew from work and therefore reported zero earnings. The burden on the second earner is then calculated as the increase in the family's tax burden when her earnings are included in family income.

The upper panel of Table 1 presents the results that would hold for all families if the second earner withdrew from work, by quintiles of primary income. Row 1 reports data means for the incomes families would have under this assumption. The next row reports average family tax burdens as *net tax*, calculated as the sum of income taxes (including the LITO) and ML, less FTBs. The ATR in row 3 is calculated as the ratio of net tax to the average income that families would have with only the primary earner in work, expressed as a percentage. The lower panel of the table reports data means for second earnings, net tax calculated as the increment in the family's tax burden due to the second earnings, and the resulting ATR on second earnings. The final row of the table shows the average number of dependent children in each quintile.

Table 1 In-work families: Tax burdens and rates, by primary income

Quintile	**1**	**2**	**3**	**4**	**5**	**All**
Primary income $pa	31004	43680	54445	67417	120055	63447
All households as single-earner families						
1. Family income $pa	31556	44759	55087	68775	123936	64958
2. Net tax $pa	-7401	-1669	2929	8353	30760	6648
3. ATR %	**-23.6**	**-3.7**	**5.3**	**12.1**	**24.8**	**10.3**
Additional tax on second earnings						
1. Second earnings $pa	11185	17809	20560	23344	22978	19159
2. Net tax $pa	3871	6314	6538	7197	7425	6266
3. ATR on second earnings %	**34.6**	**35.4**	**31.8**	**30.8**	**32.3**	**32.7**
Number of dependent children	1.92	1.79	1.89	1.92	1.97	1.90

[16] Private income is income from all non-government sources such as wages and salaries, profits, investment income and superannuation. See ABS (2005).

The average net tax on family incomes is $12,914, the sum of the amount that would be payable if the second earner worked at home, $6,648, and the additional net tax payable when she goes out to work, $6,266. Thus, if all families had only one earner or, equivalently, if all second earners withdrew from market work, the average net tax per family in the sample would fall from $12,914 pa to $6,648 pa, that is, by over 48.5 per cent. The dramatic rise in the family's tax burden when the second earner goes out to work is reflected in the very high ATRs on her earnings.

The figure of $6,266 represents an average burden for all second earners. It is very unequally distributed due to the diverse work decisions of married mothers. Only 29.7 per cent of second earners are employed full time, 36.4 per cent are in part-time work, and the remainder, 33.9 per cent, are not in the work force. As indicated in Table 2, much of the tax burden on second earners falls on the 29.7 per cent in full time (FT) work, and supporting close to the same average number of dependent children as all families in the full sample. The average burden on second earners employed FT is $11,639, which is almost twice that of the overall average of $6,266 for the full sample. Note also that families with a FT second earner are fairly evenly represented across quintiles, and so the results cannot be driven by primary earnings. While there are marginally more records in quintile 4 (see row 2), the overall mean of their primary incomes, at $60,022, is below that of $63,447 for the full sample (see Table 1).[17]

Table 2 Second earner in full time work: tax burdens by primary income

Quintiles	**1**	**2**	**3**	**4**	**5**	**All**
1. Primary income $pa	31775	43758	54074	67583	107844	60022
2. % second earner employed FT	25.4	34.6	32.2	30.8	25.6	29.7
3. Second earnings $pa	20861	30771	35843	41886	47441	35351
4. Tax on second earnings $a	7620	10509	11376	13536	15186	11639
5. ATR on second earnings %	**36.5**	**34.2**	**31.7**	**32.3**	**32.0**	**32.9**
Number of dependent children	1.70	1.69	1.63	1.72	1.82	1.71

The highest ATR on second incomes, of 36.5 per cent, appears in quintile 1. This rate reflects large FTBs losses and, in addition, withdrawal of the ML exemption on joint income. For example, a second earner in a family with a primary income near the

[17] Note that asset incomes contribute very little to average family incomes across much of the distribution, and so primary income, shown in row 1 of Table 2, largely represents primary earnings.

quintile mean and two dependent children pays an additional $930 in tax because she not only has to pay the ML on her income but she also has to repay the exemption on the primary earner's income.[18] In the case of a family in which both parents earn, say, $31,000 and have one child under 5 and another under 13 years, the second earner pays $4290 in income taxes, $930 ML and loses $7,867 in FTBs. The total is $13,088, or 42.2 per cent of her income.

Among those especially disadvantaged are two-earner families in which both parents work full time to earn around half the upper income limit of FTB-A, which is around AWE for a family with two children. They pay twice as much in personal income taxes as the single-earner family also on AWE, and they are denied FTBs. In addition, they can be disadvantaged by the Medicare Safety Net because rebates for OOP costs are dependent on eligibility for FTB-A.

It is well established empirically that male labour supplies are not especially sensitive to tax rates, whereas female labour supplies are much more so.[19] Taxes and safety nets that reduce so significantly the net earnings of second earners across low and average wage households can therefore be expected to have a strong negative effect on female labour supply and, in turn, on the tax base and GDP. The system therefore has the potential to create an ageing crisis by preventing the required reallocation of resources from home to market production with declining fertility and, as well, with technological change.

4 Labour supply, saving and health costs

Household survey data on hours of work indicate that Australia does not do well in comparison with a number of comparable OECD countries. For example, in terms of hours worked by married women aged from 25 to 64, Australia ranks below the US and UK by over 10 percentage points, and below Sweden by over 20 percentage points.[20] Participation rates reported by the OECD for these countries in 2005 are

[18] A primary income of $31,000 is below the lower joint income limit of $33,435 for the ML reduction for a family with two dependent children. The upper income limit is $39,335. Because the ML reduction is withdrawn on joint income, it is partly a joint income tax, rather than simply a flat rate tax.
[19] For a survey, see Heckman (1993).
[20] For data sources and further details, see Apps and Rees (2005).

much closer - 64, 63, 66 and 72 per cent for Australia, the UK, US and Sweden, respectively. However, female participation rates bear only a weak relationship to hours worked. While almost all married men of prime working age in these countries work full time until close to retirement, there is wide variation in full time female rates of employment. Australia has the lowest full time female rate across these countries and, as a result, the largest gender gap in market hours of work.

This section first of all presents evidence on gender differences in lifecycle labour supply behaviour drawing on data for all couple income unit records in the ABS IHS 2003-04. The sample contains 6953 records. The section then goes on to show that there is a strong positive relationship between female labour supply and household saving, purchase of private health insurance, and private health costs, using data for couple income units drawn from the ABS 2003-04 Household Expenditure Survey (HES) (2003-04)[21]. This second sample contains 4228 records.

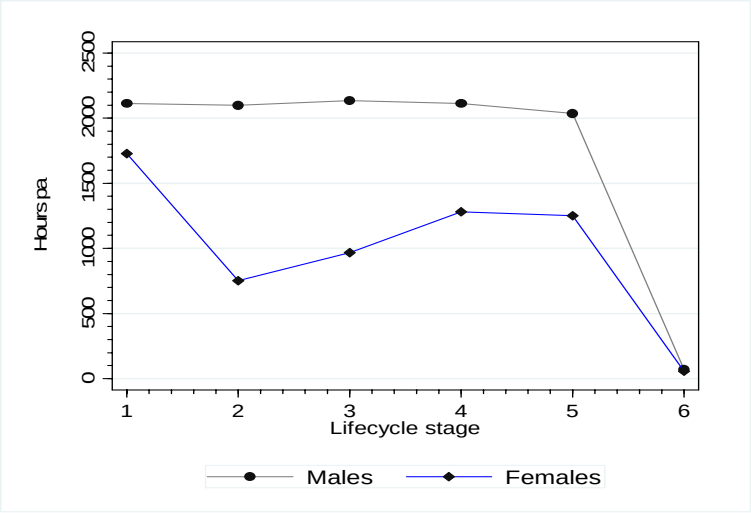
Female labour supply is strongly associated with the presence of children and therefore simultaneously with the tax treatment of married mothers as second earners. To capture the combined effects of both, we present lifecycle profiles of labour supply across six phases broadly defined as follows[22]

Phase 1:	adult members do not yet have children[23]
Phase 2:	household has children of preschool age
Phase 3:	children are of primary school age
Phase 4:	children are of high school age or have left school
Phase 5:	adults are of working age but the children have left home
Phase 6:	adults are retired, or over 55 and working part time

Figure 3 plots the weighted data means of male and female hours in each phase. The data show a dramatic fall, on average, in female market hours after the first child. In phase 1 there is only a small gap, reflecting the fact that both partners tend to work full time before the arrival of children. In phase 2 female labour supply falls to around a third of

[21] Second edition.
[22] There are 782, 945, 1041, 1072, 1551, and 1562 records in phases 1 to 6, respectively.
[23] This phase includes all couples in which the female partner is aged under 40 years and there are no children present in the household.

Figure 3: Labour supply by gender



male labour supply. Although female hours then tend to rise in the following working-age phases, they do not reach much above 50 per cent of male hours, even after the children have left home in phase 5.

Time use data show that the sharp fall in female hours in phase 2 is associated with an even more dramatic rise in hours of domestic work, much of which is childcare.[24] This suggests that, due to the demand for childcare, domestic work is a close substitute for market work in this phase. The data offer an explanation for why the labour supply elasticity of the female partner, typically on a lower wage, is found to be greater than that of the male partner, especially in a country with a poorly developed childcare sector. When market and home childcare are close substitutes, and childcare is costly, tax rates on the income of married mothers at the levels indicated in the preceding section can be expected to induce labour supply responses that generate low female hours as depicted in Figure 3.

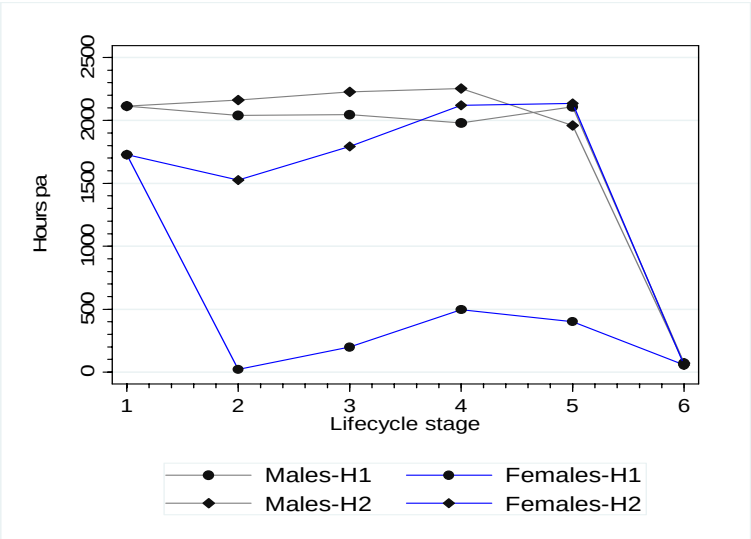
The average profile for female labour supply in Figure 3 conceals the high degree of heterogeneity observed in female hours. The majority of married women work either

[24] See Apps and Rees (2005). Time use data for a number of countries, including the UK, US and Germany, as well as the 1997 ABS Time Use Survey data, show this.

full time or not at all. If we select female records aged 25 to 59 years from the full sample of couples in the IHS, we find that 35.4 per cent are employed full time and 30.1 per cent have zero hours. Thus, a total of 65.5 per cent are at the extremes of the distribution. In contrast, the vast majority of males in the same age category, 83.6 per cent, are employed full time. Since almost all married women in phase 1 are in full time work, this heterogeneity in female hours is driven by variation in hours across phases 2 to 5. In these phases households tend to divide into two groups: those in which the female partner works few hours in the market or not at all, and those in which she works full time or relatively long part-time hours.

We split the sample into these two groups within each of these phases. The first group, labelled H1, represents households in which the female partner works below median female hours, and the second, H2, those in which she works above median hours. The separate labour supply profiles of the two groups, based on weighted data means, are plotted in Figure 4. The figure shows graphically the very different work choices of married mothers in phase 2, and the persistence of heterogeneity in those choices until retirement in phase 6.

Figure 4: Labour supplies by household type



Partitioning the sample into lifecycle phases on the criteria outlined has the effect of controlling for the presence and age of children but not for family size. If the H1

household has, on average, more children, the second earner may work fewer hours because of greater home childcare demands. However, family size cannot be the main driver of the large gap in female hours because both household groups have close to the same average number of dependents within each phase: 2.03, 2.35 and 1.78 in the H1 household and 1.65, 2.16 and 1.67 in the H2 household, across phases 2, 3 and 4, respectively. An explanation can, however, be found in the structure of tax rates on the second income.

With the arrival of the first child in phase 2, the female partner, as the lower wage parent, faces a choice between providing childcare at home and working in the market and buying-in childcare. If she works full time at home she avoids income taxes and the GST on her implicit income from, and expenditure on, home production and her family gains large FTBs. However, she loses work experience and may therefore face a lower wage later in the lifecycle, which has associated risks. On the other hand, if she goes out to work she faces very high tax rates, as well as high costs for bought-in childcare.[25] Because, as shown in the preceding section, taxes as a ratio of her gross earnings tend to fall with hours worked, she faces a non-convex budget set. This can create a discontinuity in her labour supply function, with small differences in factors, such as perceived domestic productivity or the price of bought-in childcare, inducing large differences in labour supply choices in phase 2. Panel data studies find that the time allocation decisions made at this time tend to persist over the lifecycle, even after the children have left home, as depicted in Figure 4.[26]

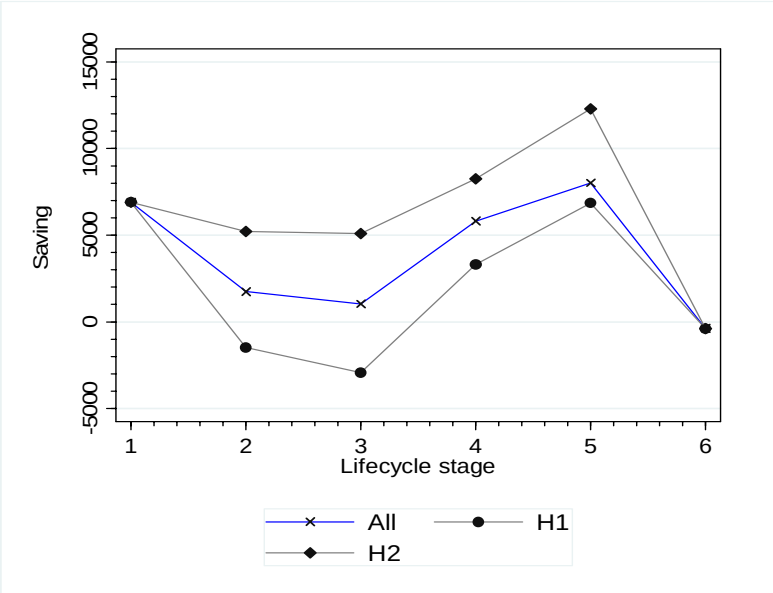
We now examine household saving and health costs using the HES data sample. Again we partition the sample into the six lifecycle phases defined above. Saving is computed as total weekly household income less total expenditure excluding the

[25] Time use data indicate she also faces a "time crunch". On average, mothers of young children in full time employment work longer total hours – market plus domestic – than those who specialise in home production, and they work longer hours than their male partners. See Apps and Rees (2003).
[26] See, for example, Shaw (1994). The studies typically specify unobserved fixed effects, following Heckman (1981), to deal with unexplained heterogeneity. For a survey see Blundell and MaCurdy (1999).

principal component of mortgage repayments, capital housing costs and superannuation and life insurance. [27]

Figure 5 plots the lifecycle profiles of median saving for each household group, and the profile for the full sample. The figure shows graphically the strong tendency for household saving to track female labour supply. This is not a surprising, given that the H1 household has chosen to substitute domestic for market work and therefore has less market income available for the purpose of saving. Median household saving by H1 households is well below that by H2 households from phase 2 to retirement. In phase 1, median saving is high because almost all female partners work full time. In phase 2 there is a sharp fall in the median of the full sample, due to a dramatic fall in the saving of H1. The median saving of the H1 household is actually negative in phases 2 and 3.

Figure 5: Lifecycle saving by household type



Again the diverse decisions of the two household groups cannot be attributed to family size or, in this case, to the effects of family size on labour supply and therefore on earnings, for two reasons. First, the household groups have close to the same

[27] Note that total expenditure includes income tax and so saving is, in effect, computed as net income less consumption expenditure.

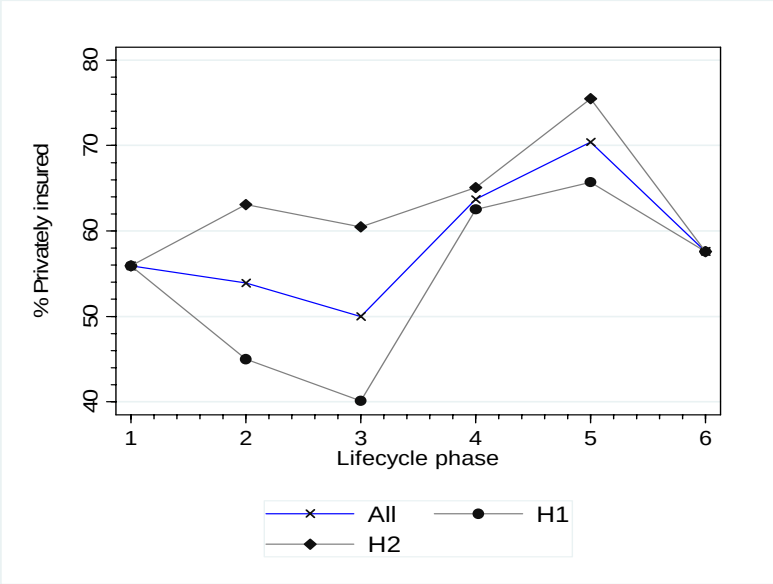
number of dependents, consistent with the data means for the larger IHS sample.[28] Second, the gap between data means for saving is much larger than the gap between medians depicted in Figure 6. Controlling for the effects of family size, lifecycle phase and the net income of each partner using regression analysis generates profiles that show a wider gap in household saving. The result is driven by a coefficient on the net income of the female partner that is around twice that on primary net income, indicating a much higher propensity to save from her net earnings.[29] An additional child is found to have a large negative effect, but because the two household groups have close to the same number of children, family size explains very little of the additional saving of the H2 household, evaluated at data means. A formal model of the joint determination of female labour supply and household saving over the lifecycle that generates profiles similar to those in Figure 5 can be found in Apps and Rees (2003).[30]

Similar results are obtained for lifecycle spending on health and insurance across the child-rearing phases. The profiles of private health insurance are depicted in Figures 6a and 6b. Figure 6a plots the percentage of households in each group, and in the full sample, that purchase private insurance to cover hospital, medical and dental costs. Figure 6b plots the corresponding data means for fees incurred by each group, and by the full sample. The H1 and H2 profiles in both figures show a strong tendency to track female labour supply in the early child-rearing years. Only 45.0 per cent of H1 households in phase 2 and 40.1 per cent in phase 3 purchase private health insurance cover for hospital, medical and dental costs. The figures for the H2 household are 63.1 per cent in phase 2 and 60.5 per cent in phase 3.

[28] For the smaller HES sample, data means for the number of children are: 1.98, 2.41 and 1.87 for the H1 household and 1.61, 2.20 and 1.63 for the H2 household, respectively.
[29] The result was found to hold across a wide range of model specifications. The models were estimated on a sample that excluded the bottom five per cent of male net incomes, negative female incomes, and the top 1 per cent of male and female net incomes, to remove the effect of outliers.
[30] An essential feature of the model is that it takes account of the presence of two-adults in the household. Much of the literature on saving behaviour treats the household as a single decision unit. See, for example, Blundell et al. (1994) and the survey by Browning et al. (1996). In models of this kind high wage H1 households are confused with much lower wage H2 households because, in effect, the models fail to control for wage rates. The studies therefore miss the strong positive association between female labour supply and household saving at a given wage level.

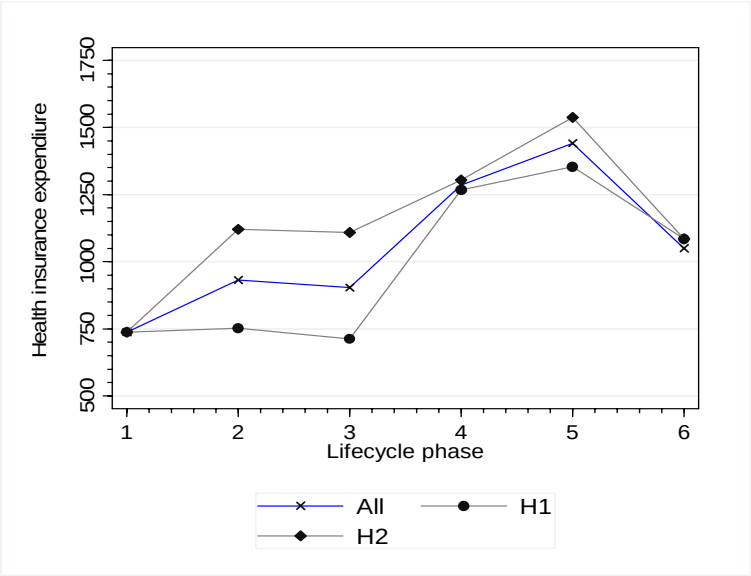
The lifecycle demand for health insurance is, in contrast to female labour supply and household saving, complicated by the rise in health risk with age. Average female hours are at their highest level in phase 1 of the lifecycle, however the health risk of the household is at its lowest point in this phase, and so the demand for health insurance is low in phase 1. In the later phases, the profiles for private health insurance tend to converge, with both rising significantly with age, as we would expect. Although rising health risk is obviously an important determinant of the shape of the profiles over the lifecycle, nevertheless it is evident that households with a higher female labour supply are more likely to purchase private insurance and to spend more on fees.[31]

Figure 6a: % private health insurance



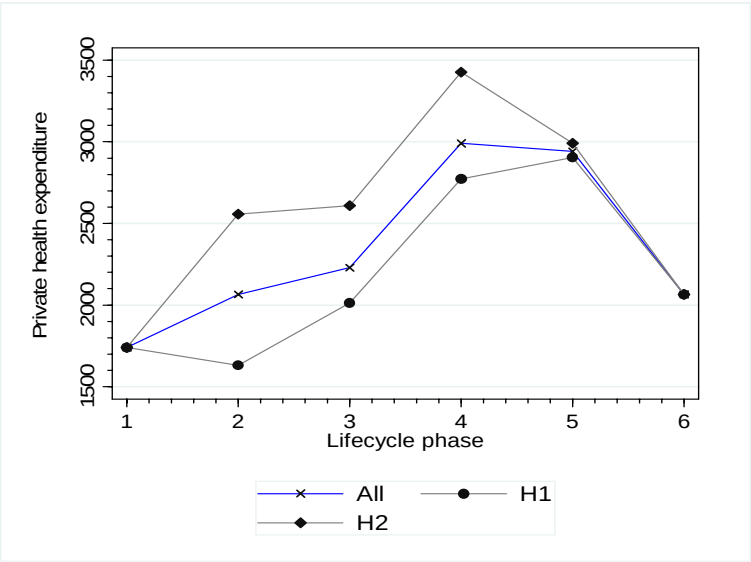
[31] This is consistent with the finding of Doiron et al. (2007) that personal income effects are stronger than other household income on the purchase of private health insurance, and that the effects of personal income are stronger for women than for men.

Figure 6b: Health insurance fees



The H2 household also typically spends more on health overall, as we would expect, given the preceding results. Figure 7 plots the lifecycle profiles of median household expenditure on medical care and health expenses. The profiles tend to match those for female labour supply up to the pre-retirement phase, where the medians for both household groups tend to converge.

Figure 7: Household health costs



These results suggest that household decisions concerning labour supply, household saving and private heath insurance cover, and spending on health overall, are made simultaneously, and in response to net of tax wage rates as well as interest rates and insurance premiums. Tax policies that create strong disincentives for female labour supply can therefore be expected to have strong negative effects on saving and private health spending. The same policies also contract the tax base, by reducing female labour supply. A reduced tax base will make the higher level of tax revenues required for funding family support, pensions and health less sustainable, while also limiting the ability of families to fund health costs privately.

In the light of this evidence, it is something of a contradiction for government to provide, on the one hand, tax subsidies to encourage saving for retirement and the purchase of private health insurance and, on the other, to put in place a family tax and support system that sharply reduces both, by inhibiting female labour supply. The policies, when examined jointly, can be seen to make very little sense as a response to a rising ADR.

Moreover, as stand alone policies, tax subsidies for superannuation and private health insurance are open to objections that are well established in the economics literature. In the first instance, it has been known since Samuelson's (1958) classic paper on overlapping generations economies that switching from a PAYG to a funded pension system cannot, *per se*, lead to an efficiency gain. There is now a large body of research that draws on the Samuelson model to show that the switch to a fully funded scheme cannot be a solution to the problems raised by declining fertility and increasing ADRs.[32] A key effect of the policy change is to require the present working generation to pay twice – they must save for their own retirement while continuing to pay taxes that finance the pensions of the currently retired. This double burden is especially problematic for working married women who are already contributing disproportionately to government revenues under the present tax system.

The approach also fails to address the problem of insurance cover for longevity risk,

[32] The studies include Breyer (1989), Geanakoplos, Mitchell and Zeldes (1998), Chand and Jaeger (1996) and Orszag and Stiglitz (1999) among others. For a discussion in the Australian context, see Apps and Rees (2002).

which is known to be notoriously badly handled by private annuity markets due to adverse selection, and which cannot be dealt with simply by increasing total saving. Individual insurance buyers are much better informed about factors such as their state of health, previous and current life style, and family health history that determine their risk class in terms of whether they have a high or low probability of a relatively short life. The private market solution to the adverse selection problem involves restricted coverage to good risks, which represents the market failure. It can be shown that an insurance system that pools all risks by giving everyone the same coverage and the same rate of return, in such a way that the scheme breaks even actuarially, involves no market failure, but does represent a redistribution of income from good to bad risks. For this reason it cannot be sustained as equilibrium on a private annuities market: sellers could always find profitable contracts that would bid good risks away from the pooled contract. However, a publicly operated pension system does not allow such separation of risk types – it enforces pooling.[33]

Similar arguments apply to health insurance markets, defined broadly to include not only those that provide coverage for health care costs, but also those that insure against loss of income and income-earning possibilities due to ill health and invalidity. Again adverse selection problems arise in such markets. There are also serious problems of market failure due to asymmetric information that arise out of moral hazard on health insurance markets.[34] Such problems arise in both public and private health insurance systems, but there appears to be no evidence to suggest that privatization of public systems actually reduces the welfare losses due to these problems, and there are a number of areas in which they could be expected to get worse.

7 Conclusions

This paper has argued against the policy position that begins with a doomsday scenario of publicly provided health insurance and pension systems threatened with

[33] Rees and Apps (2006) show that this is a better outcome than the market outcome, and would be preferred by any policy maker who is (at least weakly) averse to inequality in levels of welfare among individuals.
[34] For a general discussion, see Newhouse (1992).

collapse under the stresses imposed by population ageing, and ends by proposing privatization of these systems, for example by moving to fully-funded pension schemes, as a solution to these problems. Population ageing caused by declining fertility should be accompanied by a reallocation of resources from the household to the market sector, which would expand the flow of real output and the tax base available to meet the changed pattern of demand for goods and services arising out of the demographic changes. However, up until now, the effect of family tax and safety net systems has been to place such heavy incremental burdens on working women as second earners, that this necessary resource allocation has not taken place. Thus the threat of crisis is policy driven, and can be eliminated by making the appropriate changes in tax and family support policies.[35]

The case for privatising pension systems and health insurance markets, when considered on its own merits, is widely rejected in the literature. Funding cannot make anyone better off without making others worse off, contrary to the impression that its advocates seek to give. Indeed, because of the higher administrative and transactions costs associated with it, it has the potential to make everyone worse off, though obviously it can be structured in such a way that some gain at the greater expense of others. Experience suggests that the pattern of gains and losses would be regressive. Health insurance markets notoriously suffer from problems of market failure associated with information asymmetries. These also present problems to the design of public systems, but repeating the mantra of privatization does not represent an effective approach to solution of these problems.

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[35] Such policies would obviously need to include the development of a high quality and affordable childcare system to be effective.

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