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The Effects of Changing the Age Pension Means Test: A Lifecycle Model Simulation

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Key Findings and Policy Implications

This report summarises the results obtained by Kudrna (2015) for the effects of hypothetical changes in the existing taper rate of the Age Pension income test. Using an overlapping generations (OLG) model stylised to the Australian economy, Kudrna examined the implications of changing the income taper for lifecycle labour supply, consumption and savings of households, for key macroeconomic and fiscal aggregates and for household welfare.

The simulation results indicate that tightening the income taper combined with lower income tax rates (needed to support reduced pension expenditures) leads to

- Increased average lifecycle labour supply due partly to reduced income taxes and partly to reduced pension payments (and associated disincentives to work and generate private income);
- Larger private asset accumulations for most of the lifecycle with steeper asset withdrawals at older ages;
- Less consumption smoothing (i.e., increased consumption during working lives but lower consumption in retirement relative to the current or reduced taper);
- Positive macroeconomic effects with higher labour supply, consumption and assets per capita, as well as reduced pension expenditures both in the short run and the long run;

[1] This report has been prepared for the Committee for Sustainable Retirement Income (CSRI) roundtable. The results provided in this report are based on Kudrna (2015), which can be accessed at http://www.cepar.edu.au/media/147501/09_means_testing_of_public_pensions.pdf

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- Welfare gains for young and future generations, benefiting from increased self-funding in retirement and reduced income taxes;
- Welfare losses for current recipients of part Age Pension who face large pension cuts.

The findings have important policy implications, indicating that:

- Tightening the Age Pension means test not only improves directing public pension payments to those senior individuals most in need (currently almost 80% of the age-eligible population receives some Age Pension) but also generate significant reductions in overall government spending on the Age Pension, which is expected to increase due to an ageing of Australia's population;
- Tightening the taper combined with exemptions of labour income from means testing could be used as an alternative policy with potentially more equitable distributional implications to recently proposed changes to the access age and to indexation of the Age Pension.

1 Introduction

The Age Pension represents the major income source for most Australian retirees, with almost 80% of the age-eligible population currently receiving some pension. The pension is somewhat unusual among other developed countries in that it is non-contributory, funded through general tax revenues and means tested against pensioners' private resources, including labour earnings. The maximum pension benefit set at 27.7% of average male full time earnings is more generous and the Age Pension covers a larger proportion of the elderly population than means tested pensions in other countries. Furthermore, in most countries targeted public pensions are only income tested and not subject to both the income and asset tests as in Australia.

While the means testing of public pensions facilitates the aim of containing pension expenditures by governments, it has the effect of changing the incentives of individuals to work and save. First, it generates high effective marginal tax rates (EMTRs) for some elderly due to a withdrawal of their pension benefit, creating potentially important work and saving disincentives for older people. However, it is important to realise that means testing only affects some elderly through high EMTRs. In fact, a more aggressive withdrawal (or taper) rate affects a smaller proportion of the eligible population than a shallower taper. Second, means testing reduces

public pensions, which are known to discourage lifecycle labour supply and savings because they act as a substitute for private retirement income. Third, means tested pensions allow for lower taxes on workers, providing additional work and saving incentives. These important trade-offs between EMTRs, the number of people affected, and income taxes needed to support the Age Pension are captured by the model of the Australian economy applied by Kudrna (2015) to examine the implications of varying the pension means test.

This report summarises the results obtained by Kudrna (2015), with a particular focus on the effects of tightening the existing taper of the Age Pension income test. The next section provides a non-technical description of the model and compares the benchmark model solution with Australian data. The implications of changing the income taper are then discussed for the lifecycle behaviour of households, key macroeconomic aggregates and welfare of different cohrts and income types of households. The final section offers some policy implications.

2 The Model and Benchmark Economy

2.1 Model Overview

The model builds upon a general equilibrium OLG model developed for Australia by Kudrna and Woodland (2011a, b).[3] There are two important extensions incorporated into this model: a more detailed intra-generational heterogeneity based on income distribution data from Australian Bureau of Statistics (ABS) (2012); and an updated calibration with a rich treatment of retirement income policy in 2012.

The model consists of: (i) a detailed household sector, with households distinguished by age and income type; (ii) the main aspects of the Age Pension and mandatory superannuation; (iii) a perfectly competitive production sector with profit maximising firms; (iii) a government sector with a detailed fiscal structure; and (iv) a foreign sector with international budget constraints and exogenous interest rate.

The methodology has a range of features that make it particularly appropriate for the analysis of the means testing of public pensions:

[3] The model is essentially a small open economy variant of the Auerbach and Kotlikoff's (1987) OLG model that is augmented for the Australian economy.

- Multiple generations or cohorts aged from 21 to 90 years, with each generation represented by 5 heterogeneous households (i.e., income quintiles) distinguished by their lifetime earnings ability profiles and social welfare transfers based on ABS (2012a);
- Life cycle utility maximisation with endogenous retirement and a broader means test imposed on both asset income and labour earnings - allowing for a different means test treatment of these two sources of private income;
- Mortality risk - since uncertainty about the future lifespan influences household's lifecycle choices regarding consumption, saving and labour supply;
- Detailed model-equivalent representation of the means tested age pension, the fully funded superannuation guarantee and tax policy settings with progressive income, consumption, superannuation and corporation taxes;
- Dynamic and general equilibrium aspects of the model.

Since the age pension is an important pillar of Australia's retirement income policy, the changes to pension payments have the potential not only to affect the behaviour of households directly impacted by the changes, but also to have important macroeconomic effects and budgetary implications for the government with further feedback effects on all households. Importantly, the model with the key features listed above allows for crucial interactions between retirement and tax policies, macroeconomic impacts and household behaviour.

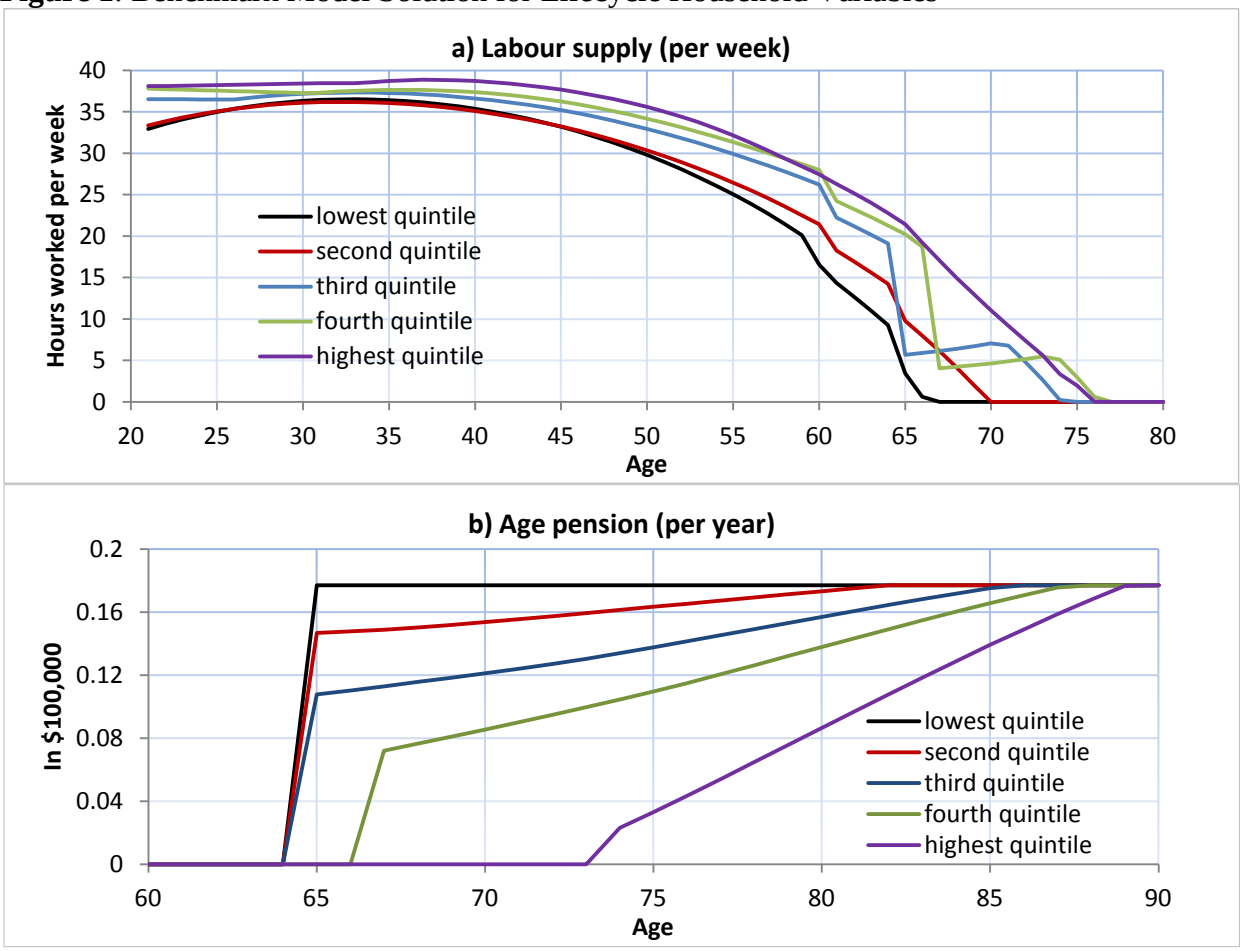
2.2 Benchmark and Data Comparison

The benchmark economy of the model is calibrated to key Australian data averaged over the 5-year period ending in June 2012, with tax and pension policy settings and parameters matching those applicable in 2012.[4] Although this subsection compares only the benchmark solution for the lifecycle profiles of labour supply and age pension with Australian data, the model replicates the Australian economy fairly well in terms of matching the components of aggregate demand and government indicators (see Kudrna, 2015). It also does a good job in matching the observed net income shares across the income quintiles and the Gini coefficient.

[4] See Kudrna (2015) for details on the parameterisation of the model and the computational technique to solve for the benchmark steady state equilibrium as well as for the transition between the benchmark and new policy steady states.

As shown in Figure 1b, the Age Pension differs across the quintiles due to its means testing. While the lowest quintile receives the maximum benefit from age 65 onwards (with assessable income below the income disregard), the second and third quintiles receive part pension at age 65 and the highest quintile households do not receive any pension until age 72. The pension payments increase with age as households run down their private assets in retirement.

Figure 1: Benchmark Model Solution for Lifecycle Household Variables

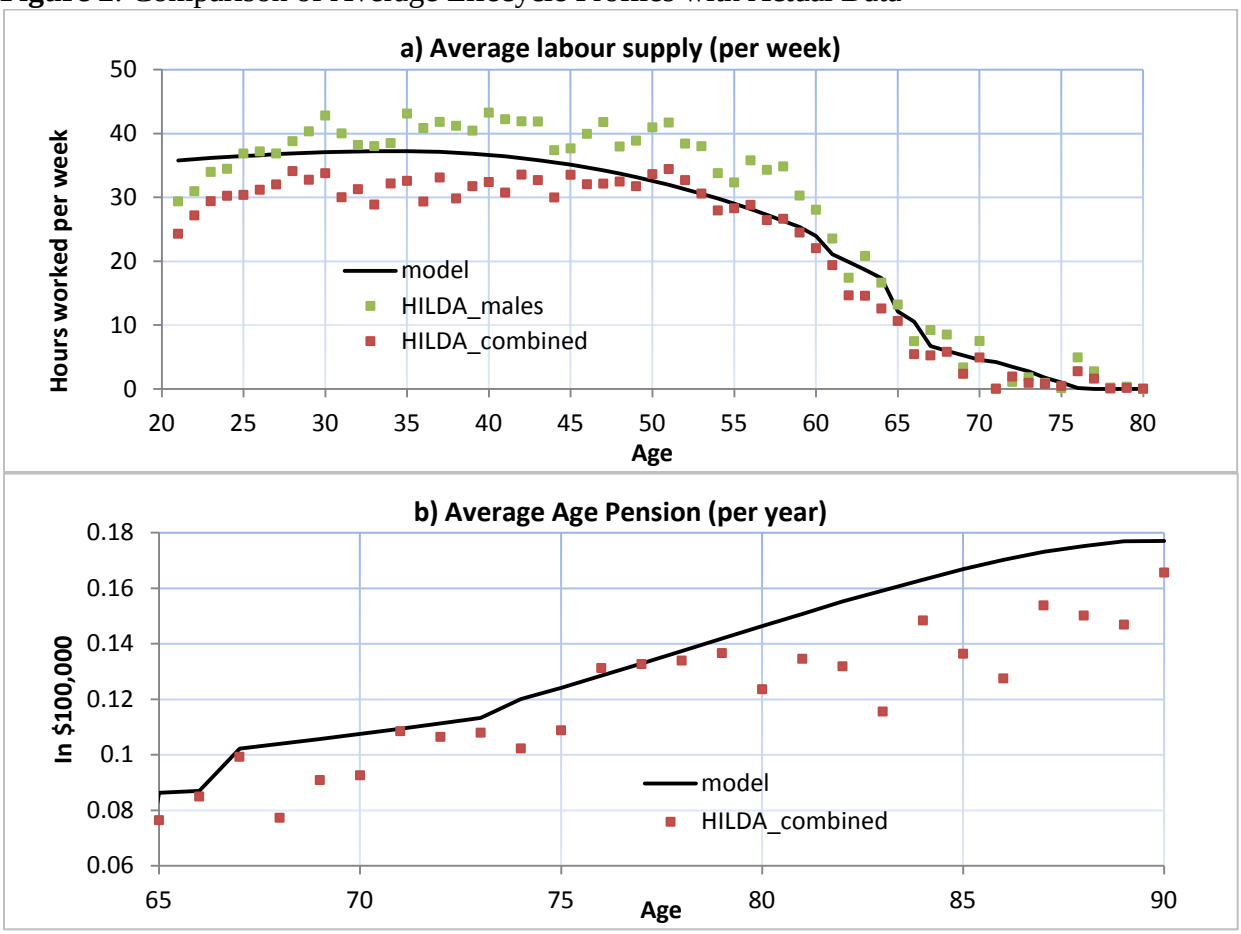


The labour supply profiles plotted in Figure 1a exhibit the standard hump-shape, mainly reflecting the assumed hump-shaped productivity over the lifecycle. The pension payments have also important labour supply impacts, which vary across the quintiles. The two lowest quintiles reduce their working hours at age 65 as a result of the income effect that their pension payments generate. The sudden drop in labour supply of the third quintile at age 65 is to avoid high EMTRs on earnings generated by the means test. Specifically, the third quintile at early age

pension ages reduces working hours to earn exactly $6,500 per year that is not means tested.[5] The same labour supply behaviour is shown for the fourth quintile at age 67. The richest quintile experiences a smooth transition to retirement, being unaffected by the pension or its means test. In sum, the means test has a negative impact on labour supply of only the third and fourth quintiles at early age pension ages.

The model-generated profiles for labour supply and pension payments averaged across the quintiles and the cross-section data derived from HILDA surveys (Wooden *et al*., 2002) are plotted in Figure 2. The comparison reveals similar shapes as well as levels of the model-generated and data-based profiles for the two selected household variables.

Figure 2: Comparison of Average Lifecycle Profiles with Actual Data



Notes: The HILDA profiles are derived from the individual data set of wave 10 conducted in 2010. The combined profiles relate to the average across males and females. The HILDA 2010 values for the Age Pension are inflated at the wage inflation rate of 3.5% to 2012.

[5] Labour supply is a continuous variable in the model and so households can choose to work any fraction of their total time endowment.

3 Simulation Results

The benchmark model with the existing 50% taper that was briefly described above is used to simulate four hypothetical changes in the taper rate, setting it to 0%, 25%, 75% and 100%. Each policy change is assumed to be implemented in 2012 and the government budget is assumed to be balanced by adjusting the progressive income tax schedule (i.e., proportionally increasing or reducing average/marginal tax rates). Setting the taper to 0% represents a shift to the universal pension (or demogrant) paid at a flat rate to all age-eligible individuals, whereas setting the taper to 100% represents a strict means test policy that almost half the current maximum private income to qualify for any pension.

The results presented and discussed below relate to disaggregate behavioural implications as well as to the macroeconomic and welfare implications. Both long run steady state and transitional effects of the investigate taper rate changes are examined.

3.1 Behavioural Implications

The long run steady state effects of the taper rate changes on average lifecycle labour supply, consumption and total assets are provided in Figure 3.[6] For ease of exposition, each graph compares the benchmark steady state profile (averaged across the income quintiles) only with the average profiles obtained by setting the taper to 0% (universal pension) and to 100% (strict means test).

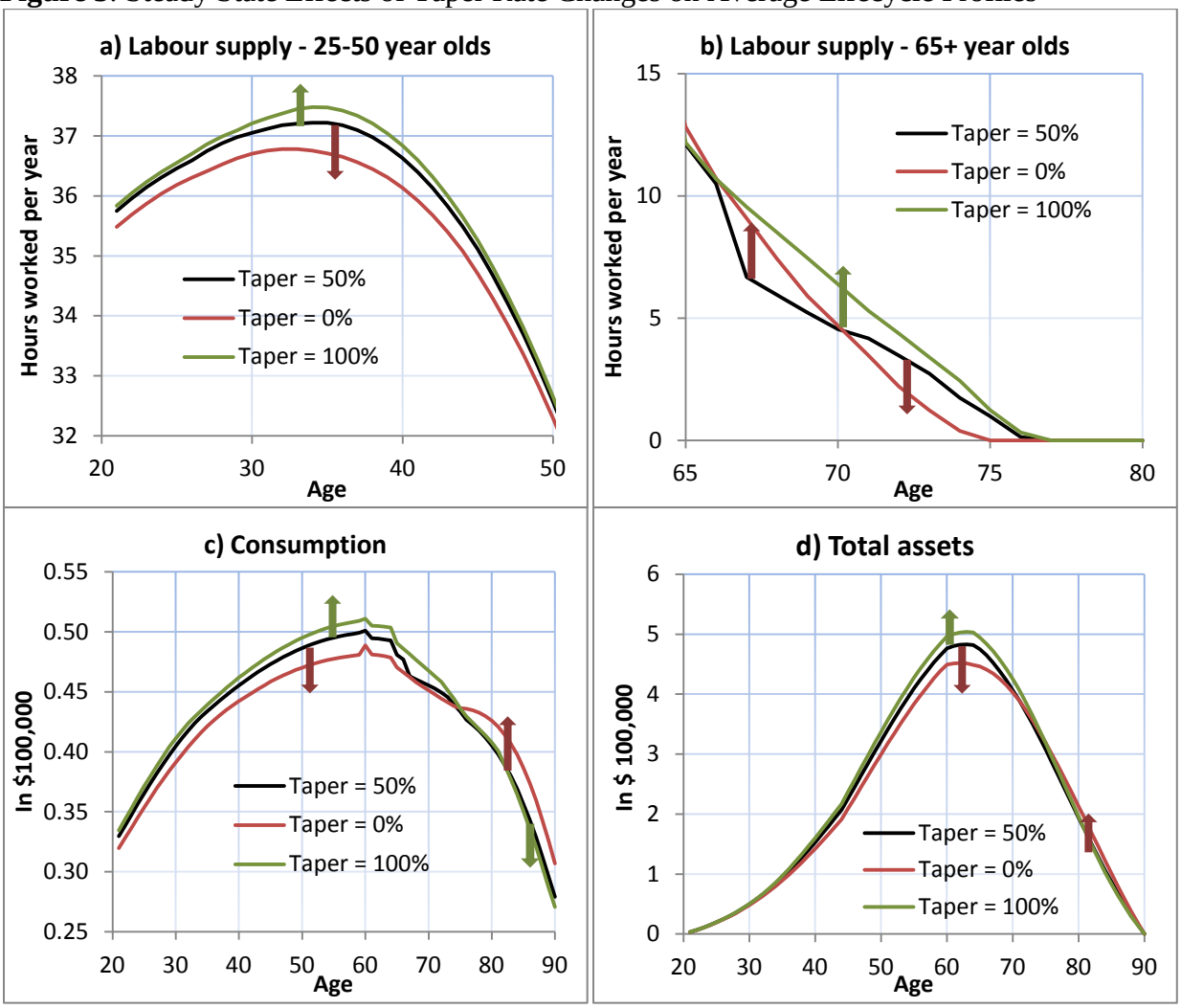
Several observations can be drawn from the figure below. First, the high taper rate policy leads to less consumption smoothing with increased consumption over the working periods but lower consumption in retirement. Second, it results in larger asset accumulations for most of the lifecycle but with steeper asset withdrawals or draw downs at older ages. Third, tightening the taper has a positive effect on average lifecycle labour supply.[7] These effects are due partly to reduced pension payments to elderly households. There are also important indirect effects due to reduced income tax rates (needed to financed the pension expenditures with the tight taper), supporting lifecycle labour supply and savings. Note that the results for the means test removal

[6] The long run steady state implications apply if there has been sufficient time for the economy to adjust completely to the new policy settings. In this case, households of different generations, but of the same income type, face the same economic environments (though at different calendar times) and so behave in exactly the same way.

[7] These behavioural effects of the taper rate changes are in line with other studies (e.g., Kumru and Piggott (2009) for the UK and Tran and Woodland (2014) for Australia).

by setting the taper to 0% show the opposite behavioural effects, compared to those outlined above for the strict means test policy change.

Figure 3: Steady State Effects of Taper Rate Changes on Average Lifecycle Profiles



Notes: The current 50% taper is used in the benchmark model; Under two reported policy experiments, the income taper is reduced to 0% (universal pension) and increased to 100% (strict means test).

Interestingly, the high taper rate policy also increases average labour supply of older households, as shown in Figure 3b. In order to explain this positive effect on average labour supply at older ages, Table 1 reports the disaggregate effects on average labour supply for the 25 to 55 and 65 plus year olds of each income quintile. The results show that under the high taper policy, several income types aged 65 and over increase their labour supply, with average labour supply of 65 plus year olds up by 13.43% relative to the benchmark with the 50% taper. While the lowest quintile on full pension irrespective of the taper increases labour supply only

marginally, the second, third and fourth quintiles demonstrate significantly higher labour supply at older ages. Although these three income types work more to offset reduced pension payments, there are significant differences in their labour supply responses to the increased taper. The second quintile work and earn more but the EMTRs on labour earnings are not affected because the maximum earnings exemption from the means test is not exceeded. The increased labour supply of 65 plus year olds in the third quintile is due to an increased retirement age.[8] The fourth quintile no longer qualifies for any pension at early age pension ages. These households increase their labour supply (working similar hours as the richest quintile) because they no longer face any labour supply distortions due to the means test.

Table 1: Long Run Effects of Taper Rate Changes on Household Labour Supply
(Percentage Changes in Hours Worked Relative to Benchmark with Taper = 50%)

Household income type	Taper = 0%		Taper = 100%	
	25-50	65+	25-55	65+
- Lowest quintile	-0.21	-21.64	0.09	2.03
- Second quintile	-0.36	-29.39	0.04	36.04
- Third quintile	-1.20	39.99	0.40	21.96
- Fourth quintile	-1.93	24.77	0.93	54.65
- Highest quintile	-1.50	-14.73	0.69	-4.56
Average across all types	-1.41	-0.68	0.62	13.43

Notes: The results relate to average labour supply for 25-55 and 65 plus year olds.

3.2 Macroeconomic Implications

The simulation results of tightening the income taper presented in Table 2 show positive effects on most macroeconomic variables, including per capita labour supply, assets and consumption as well as reduced government expenditures on the Age Pension. In particular, the taper increased to 100% generates 0.82% increase in labour supply, 4.28% increase in domestic assets and 1.63% increase in per capita consumption (a measure of living standards). These effects are mainly due to reduced income taxes needed to support the Age Pension expenditures that decline by 17.04% in the long run as a result of the 100% taper. Conversely, lowering the current 50% taper rate has negative macroeconomic and fiscal effects. For example, the results

[8] The third quintile households work the same hours at early age pension ages as in the benchmark, in order to avoid high EMTRs on their earnings, but postpone retirement to offset lower pension payments caused by the increased taper on their asset income.

for the removal of the means test (i.e., Taper = 0%) show a significant increase in the Age Pension expenditures by almost 42% from current 2.8% of GDP to over 4% of GDP, requiring an income tax hike of over 11%.

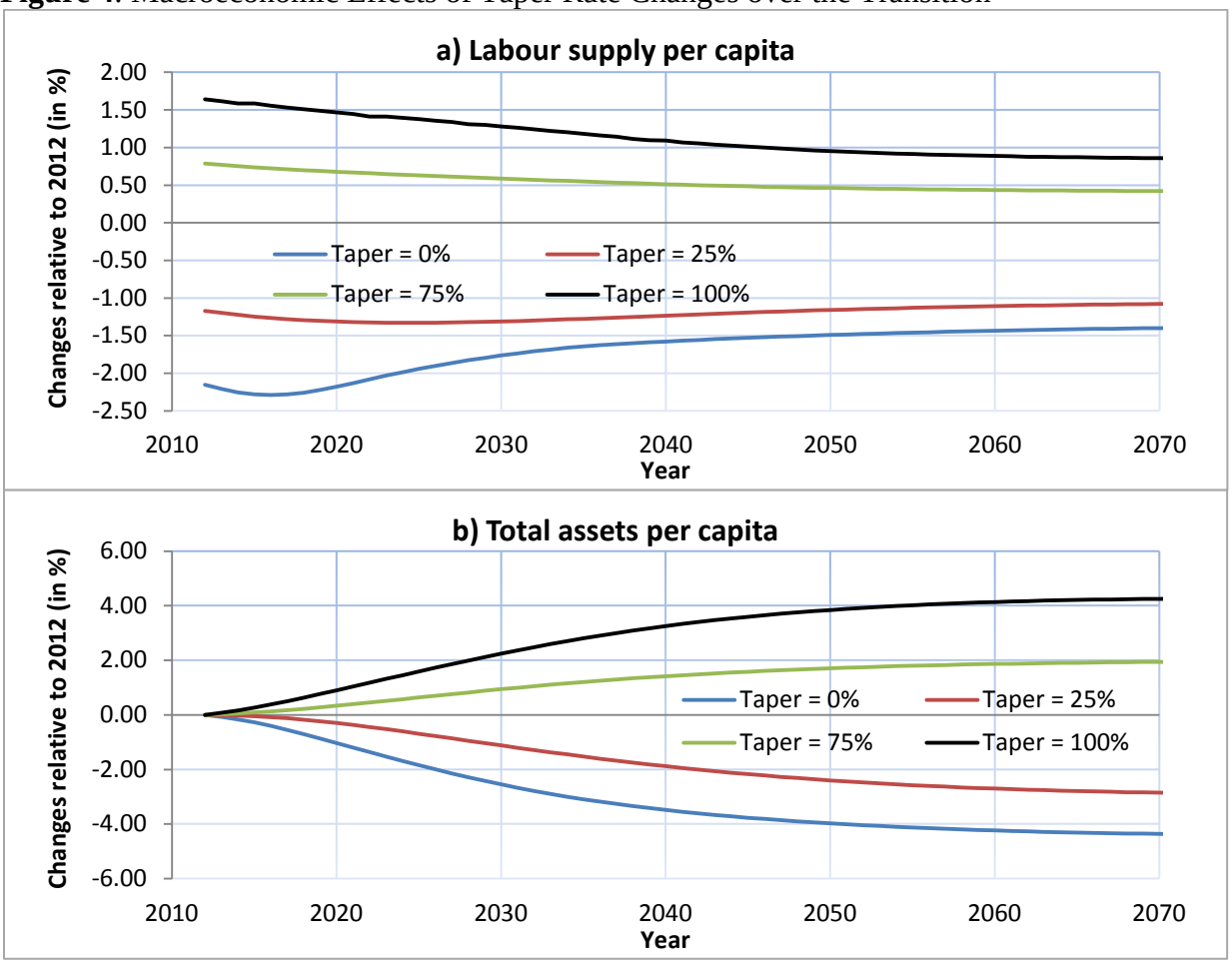
Table 2: Macroeconomic Effects of Taper Rate Changes in the Long Run
(Percentage Changes in Selected Variables Relative to Benchmark with Taper = 50%)

Variables	Changes in Income Taper from 50% to			
	0%	25%	75%	100%
Labour supply	-1.38	-1.06	0.40	0.82
- 25-55 year olds	-1.41	-0.59	0.34	0.62
- 65+ year olds	-0.68	-24.06	4.97	13.43
Domestic assets	-4.41	-2.94	1.98	4.28
Consumption	-2.30	-1.69	0.78	1.63
Age pension expenditures	41.66	18.23	-9.89	-17.04
Income tax rates [a]	11.16	6.28	-3.19	-6.01

Notes: [a] Adjustments to income taxes assumed to balance the government budget.

Tightening the taper increases per capita labour supply and assets not only in the long run but also in the short run and during the transition, as shown in Figure 4. In fact, the short run effects on labour supply are more positive than the long run implications as current middle age and older cohorts work more to offset large pension cuts. The transitional decreases in labour supply relative to the impact effect in 2012 are due to a greater asset accumulation by future generations, generating an income effect on their labour supply. However, in the long run, per capita labour supply is still over 0.8% higher than in the benchmark with the 50% taper. Interestingly, the effects of reducing the taper are almost symmetrically opposite to those of the higher taper rate changes. Setting the taper to 0% (the means test removal with an universal pension) reduces per capita labour supply more in the short run than in the long run as on impact older households cut their working hours due to receiving full Age Pension. Over time, future generations accumulate smaller assets because of increased income taxes, causing per capita labour supply to increase (but per capita consumption to decline) in the subsequent years of the transition.

Figure 4: Macroeconomic Effects of Taper Rate Changes over the Transition

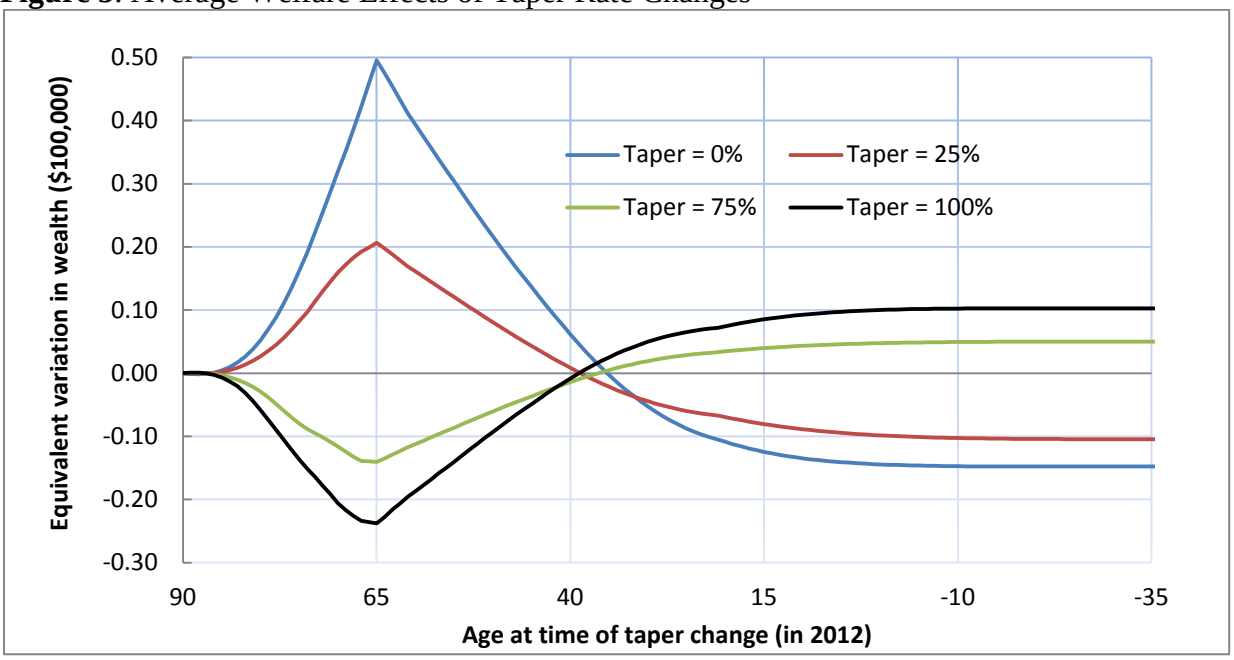


Notes: The effects of changing the income taper are shown as percentage changes with respect to the benchmark in 2012 with taper = 50%.

3.3 Welfare Effects

The welfare effects are obtained by calculating the change in initial assets/wealth for each generation that is needed in the benchmark to produce the remaining lifetime utility under the policy change (see, for example, Nishiyama and Smetters, 2007). Figure 5 displays the average welfare effects across the five income groups as a function of cohort's age at the time of the policy change. Recall that each hypothetical change in the taper rate is assumed to be adopted in 2012, with the cohort aged 21 (90) years being the youngest (oldest) alive in 2012. The positive (negative) wealth transfers in the figure below indicate welfare gains (losses).

Figure 5: Average Welfare Effects of Taper Rate Changes



Notes: The welfare implications of the taper rate changes for each cohort are measured as equivalent variations of one time wealth transfers in 2012.

The welfare effects are shown to be almost symmetrically opposite when the two taper increases are compared with the two examined taper reductions. Tightening the taper results in welfare losses to elderly households and those approaching retirement due to cuts in their pensions, but young and future generations, on average, experience welfare gains, benefiting from reduced income tax rates and increased savings. Conversely, the two taper reductions have large positive effects on the welfare of currently old households (now receiving full pension) but negative effects on the welfare of future generations. For instance, the generation aged 65 in 2012 would gain almost $50,000 in initial resources under taper = 0%, whereas the same cohort would lose almost $24,000 under taper = 100%. However, in the long run, the average welfare is shown to increase by over $10,000 for taper = 100% and to decline by about $15,000 for taper = 0%. It is important to note that current young and future generations who gain from tightening the taper are larger in size compared to currently old generations.

Table 3 reports on the inter-generational implications for the selected cohorts and the intra-generational implications for each income quintile. The effects of the taper set to 0% and 100% are shown to be greater for richer quintiles as they hold larger lifetime wealth relative to lower income households. In fact, the welfare of the lowest quintile is affected only indirectly through

the budget-equilibrating changes in income tax rates because these households receive full pension irrespective of the taper. The welfare of other income quintiles is also affected by the direct effect that the examined taper rate changes have on their current or future pension payments. The changes in pension payments are particularly important for the current elderly, whereas the required changes in income tax rates to support the pension expenditure are the key driver of future generations' welfare (especially the welfare of richer households).

Table 3: Distributional Welfare Effects of Taper Rate Changes
(Equivalent Variations of One-time Wealth Transfers at Time of Policy Change)

Policy change	Age in 2012	Household Income Type				
		Lowest	Second	Third	Fourth	Highest
Taper = 0%	80	-0.01	-0.01	0.02	0.07	0.19
	65	-0.02	0.12	0.41	0.78	1.19
	40	-0.02	0.05	0.12	0.16	-0.01
	21	-0.01	0.01	-0.01	-0.08	-0.42
	-80	-0.02	-0.01	-0.05	-0.14	-0.52
Taper = 100%	80	0.00	0.00	-0.02	-0.07	-0.21
	65	0.01	-0.11	-0.38	-0.48	-0.23
	40	0.01	-0.06	-0.17	-0.09	0.27
	21	0.01	-0.02	-0.05	0.05	0.37
	-80	0.01	-0.01	-0.03	0.09	0.45

Notes: Initial wealth transfers presented in units of $100,000.

4 Conclusion

This report has presented and discussed the main results for alternative taper rates of the Age Pension means test obtained by Kudrna (2015), using a lifecycle OLG model calibrated to the Australian economy. The key findings include higher per capita (and household lifecycle) labour supply, domestic assets, consumption as well as long run welfare gains, resulting from tightening the existing taper rate of the Age Pension income test. These positive effects are due partly to reduced Age Pension received by households (and associated disincentives to work and save) and partly to lower income taxes assumed to balance the government budget with reduced

pension expenditures.[9] However, many existing older generations are found to attain large welfare losses as the increased taper reduces their pension payments.

Our findings have important policy implications for Australia and also for other ageing economies facing increasing future pension liabilities. Strengthening the means test leads to significant reductions in overall government spending on the Age Pension and, therefore, could be used as an alternative policy to the recently proposed changes in the access age and the indexation of the Age Pension. To minimise the transitional welfare losses the pension taper should be increased gradually over the next decade to give households enough time to adjust their behaviour. In addition, tightening the pension taper should be combined with additional exemptions (or complete removal) of labour income from means testing to further encourage labour supply at older ages.[10] Such reform has recently been recommended for advanced economies by the International Monetary Fund (2014).

Any modelling analysis such as that employed in this report are subject to qualifications and limitations. First, the model includes only the pension income test, which currently binds for most part pensioners. The recent changes to the pension asset test that included doubling the existing asset taper from 2017 onwards will alter pension payments for many part pensioners, generating EMTRs on their savings well in excess of 100%. Second, our analysis abstracts from explicit modelling of owner-occupied housing that is an important asset of Australian households and benefit from current uncapped exemption from the pension means test. We leave these extensions for future research.

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[9] These effects are robust to an endogenous interest rate framework (such as imperfect capital mobility or closed economy) and particularly to an ageing environment, which further strengthens the case for the means testing of public pensions (see the section on sensitivity analysis in Kudrna, 2015).

[10] Kudrna (2015) also shows that a complete removal of labour income from the income test has important and largely positive effects on labour supply at older ages, but only little impact on pension expenditures.

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