ACCESS ECONOMICS Pty Limited

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Retirement Incomes Policy:

Annuities Simulations Paper

Report by Access Economics Pty Limited for

Challenger Financial Services

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1. Introduction

Challenger Financial Services ('Challenger') is making a submission to the Henry Review outlining potential improvements to Australia's retirement income policies.

To inform its submission, Challenger approached Access Economics to assess the various costs and benefits associated with a range of potential changes to policy.[1]

Access Economics modelled two broad sets of simulations:

- Income tax reforms (essentially, changes to contributions taxes), building on the work done by Geoff Carmody & Associates (GCA).
- A shift towards annuities, building on the work done by Towers Perrin (TP).

This report concentrates on the latter.

[1] Access Economics has undertaken an independent 'costing' role for Challenger. We have neither designed nor advocated any specific policy proposals.

2. THE BASELINE OUTLOOK

Some background is useful here. When Australia first considered the shift to compulsory superannuation, most actuarial estimates of the required contribution rates to achieve adequate retirement incomes centred on a 15% contribution rate. The boom of recent years rapidly saw that equation change – personal income tax rates were lowered, the tax on superannuation end benefits was abolished, retirement ages lifted, benefits to self-funded retirees were increased, the age pension was formally indexed to wages rather than prices (and hence allowed for in modelling of future adequacy), and the withdrawal rate of pension entitlements was made more generous.

Most importantly, however, a long boom in markets here and overseas saw a marked leap in assets held both within and outside the superannuation sector.

Hence, although the legislated compulsory Superannuation Guarantee (SG) rate was only ever 9% (albeit propped up by voluntary contributions), estimates of retirement income adequacy leapt in recent years.

Despite the fact that Australia's superannuation system is still well shy of maturity (when all workers will have paid compulsory superannuation across their entire working lives), retirement income adequacy rose rapidly, especially through 2007, aided by strong markets and by the legislative and regulatory changes accompanying the introduction of the *Simpler Super* system which led to a surge in voluntary contributions ahead of June 2007.

However, the global financial crisis has since seen the value of most sharemarkets halve.

Although other asset values have been less affected (which means both superannuation and overall wealth has fared better than share market wealth), updated estimates of retirement income adequacy have eased once more, though as of today they remain comfortably above where they were several years ago.

More broadly, Australia's compulsory superannuation system remains a relatively new feature of the retirement incomes landscape, and a relatively long way from 'system maturity'.

Current benefits paid from super reflect the experience of workers who have spent only a fraction of their working lives making contributions to super under the SG arrangements. As workers who have spent a greater share of their working lives within the system retire, benefits from super will rise to reflect that longer period of accumulation.

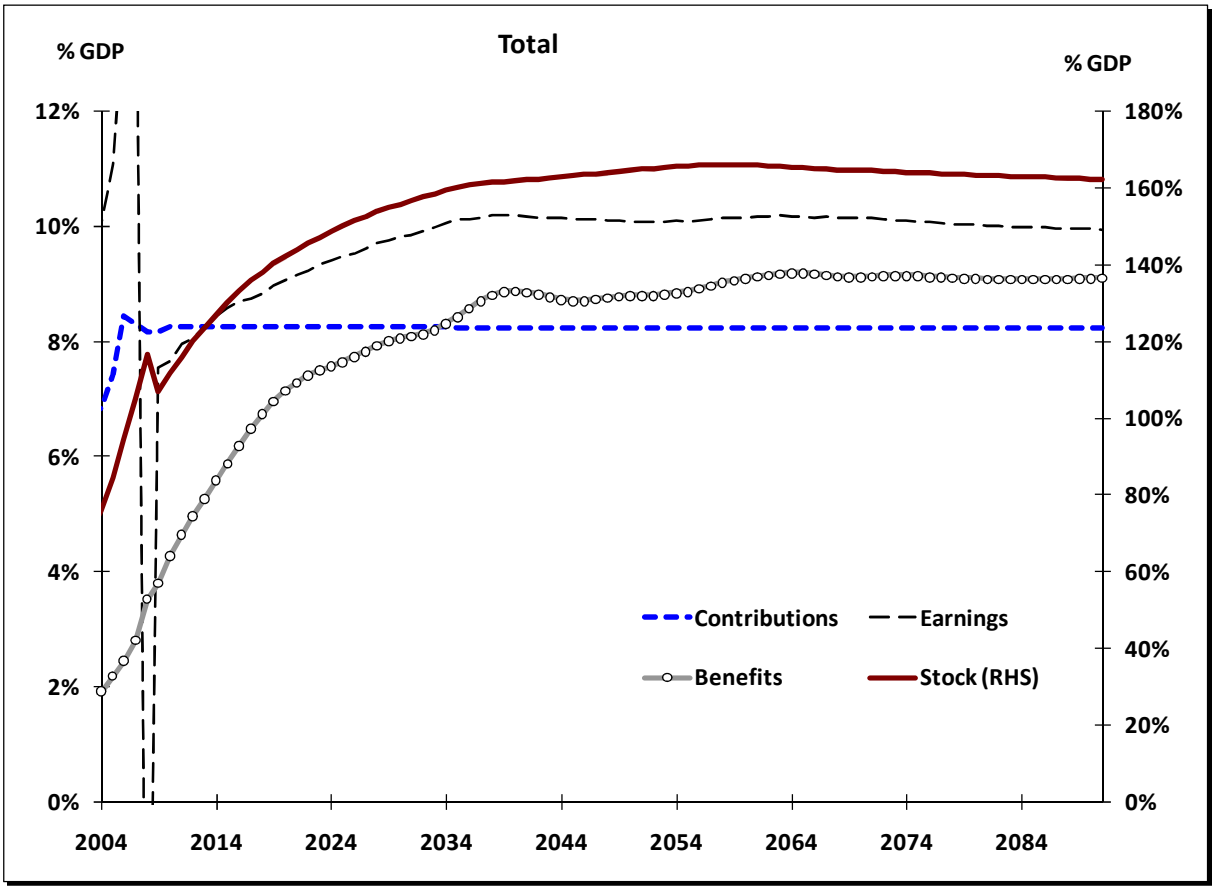
This maturing process is clearly evident in Chart 1 below. (Note that earnings in the chart move sharply in recent history because markets did the same.) While contributions can be expected to remain at current levels, **the stock of super assets will grow over time**. That is no surprise, since the super system is designed to operate over the whole of an individual's working life, and that system has only been in place since 1992.

A long run, or 'steady state' level of super assets will take time to develop. Results from Access Economics' *SuperSim* (discussed at Appendix A) baseline projections show the stock of super assets continuing to grow as a share of the economy for decades to come.

Note that, unlike Treasury's analysis of superannuation, Access Economics' includes both the superannuation holdings of workers and of retirees (whereas Treasury's only includes

those of workers – that is, super assets built up during 'the accumulation phase'). To aid in comparability, Chart 1 uses the same approach as Treasury (that is, it shows super assets and flows built up during 'the accumulation phase').

CHART 1: SUPERANNUATION SYSTEM PROJECTIONS (ACCUMULATION PHASE)



This latter feature of Access Economics' modelling approach means that it takes longer for the stock of super assets to 'mature' as a multiple of national income, because that requires not merely that all workers have contributed through all their working lives (that is, a mature accumulation phase), but also that all retirees have access to the resulting retirement benefits (a mature pension phase).

Benefits from super also rise as the current arrangements mature, with **long run benefit levels expected to more than double their current share of output**, at 10.2% of GDP.

2.1 OUTCOMES FOR RETIREES

As the super system matures, its importance in providing funds to support Australians in their retirement will grow.

Many of today's retirees have spent less than half of their working lives in the SG system, while new entrants to the workforce can expect to contribute 9% of their wages for more than 40 years. As a result, future retirees will have accumulated more benefits from super, and will have higher incomes as a result.

CHART 2: PROJECTIONS FOR NEW NET RETIREE BENEFITS

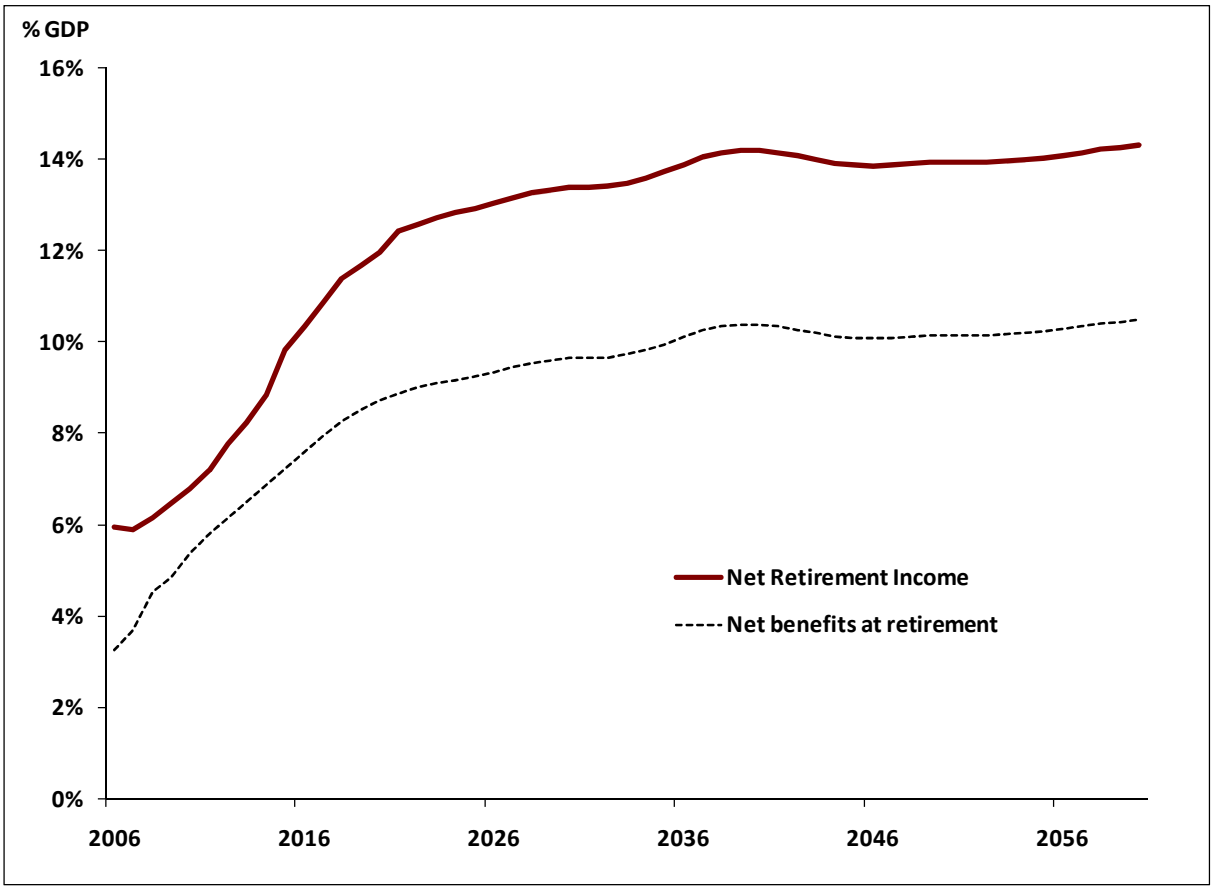


Chart 2 includes two series – the income actually received in retirement ('net retirement income' in the chart), and the income earning potential as at the date of retirement ('net benefits at retirement' in the chart). In the mature system, capital drawdowns are being broadly offset by inflows of new capital. As a result, the difference in the two series in the chart above is driven by pensions and returns: the former series is higher than the latter due to the age pension, and because people are earning returns on their assets during their retirement.

Retirees can continue to rely on super benefits to provide income long after those benefits are removed from the accumulation phase of the super system.

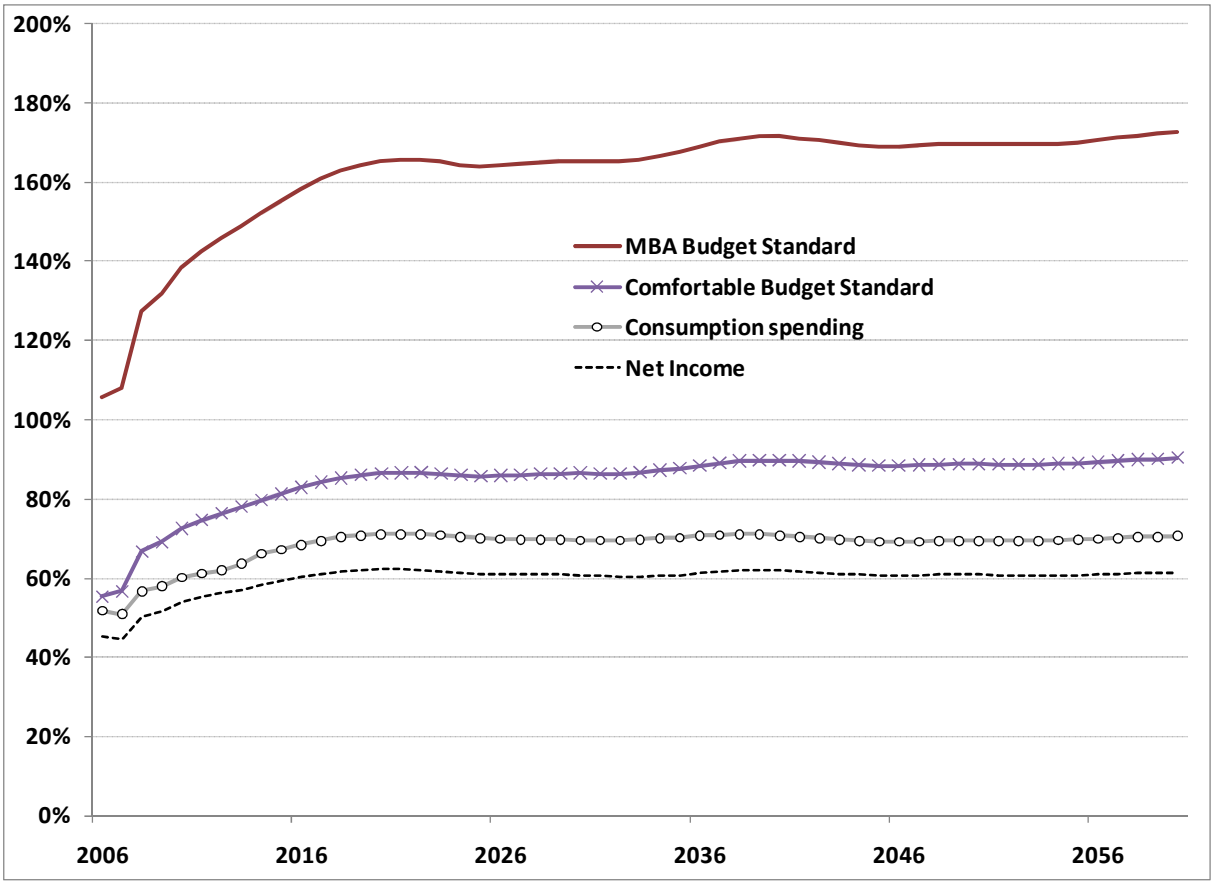
Because income from super assets is taxed at concessional rates, the measures presented here are in after-tax terms. In the case of new net benefits, the value of all future taxes payable on super assets is accounted for. By including the tax advantages of super relative to other assets in retirement, the *SuperSim* model is able to better reflect the living standards of retirees.

Measuring those living standards is subjective, but can be made less so by means of a sensible yardstick. Once such method of measuring retirement living standards is known as a 'replacement ratio'. By looking at the level of income in retirement relative to that in the later years of working life, this measure provides an indication of the relative change in living standards as workers move into retirement.

Chart 3 shows results for four such 'replacement ratios' from the *SuperSim* model baseline:

- **Ability to maintain in retirement the consumer spending achieved before retirement**: The first replacement ratio compares the average level of income that retirees earn from super benefits and other investments such as rental housing or shares to the consumption spending of 55-59 year olds in the same year. By excluding taxes and savings from both items in this comparison, the focus is placed on that which matters most to the welfare of retirees – consumption of goods and services.
- **Ability to maintain in retirement the after-tax income achieved before retirement**: The second replacement ratio measure is similar, except that it compares the average level of income that retirees earn from super benefits and other investments such as rental housing or shares to the incomes of 55-59 year olds. Because the income of 55-59 year olds is higher than the consumer spending of 55-59 year olds, this second measure is at lower levels than the first.
- **Ability to achieve a 'modest but adequate' (MBA) standard of living in retirement**: The third measure compares incomes in retirement with the Westpac/ASFA Retirement Living Standard, which measures the cost of a fixed standard of living relative to that of the wider Australian community.
- **Ability to achieve a 'comfortable' standard of living in retirement**: The final measure compares incomes in retirement with the Westpac/ASFA Retirement Living Standard, which measures the cost of a higher but still fixed standard of living relative to that of the wider Australian community.

CHART 3: AVERAGE REPLACEMENT RATE MEASURES – BY YEAR OF RETIREMENT



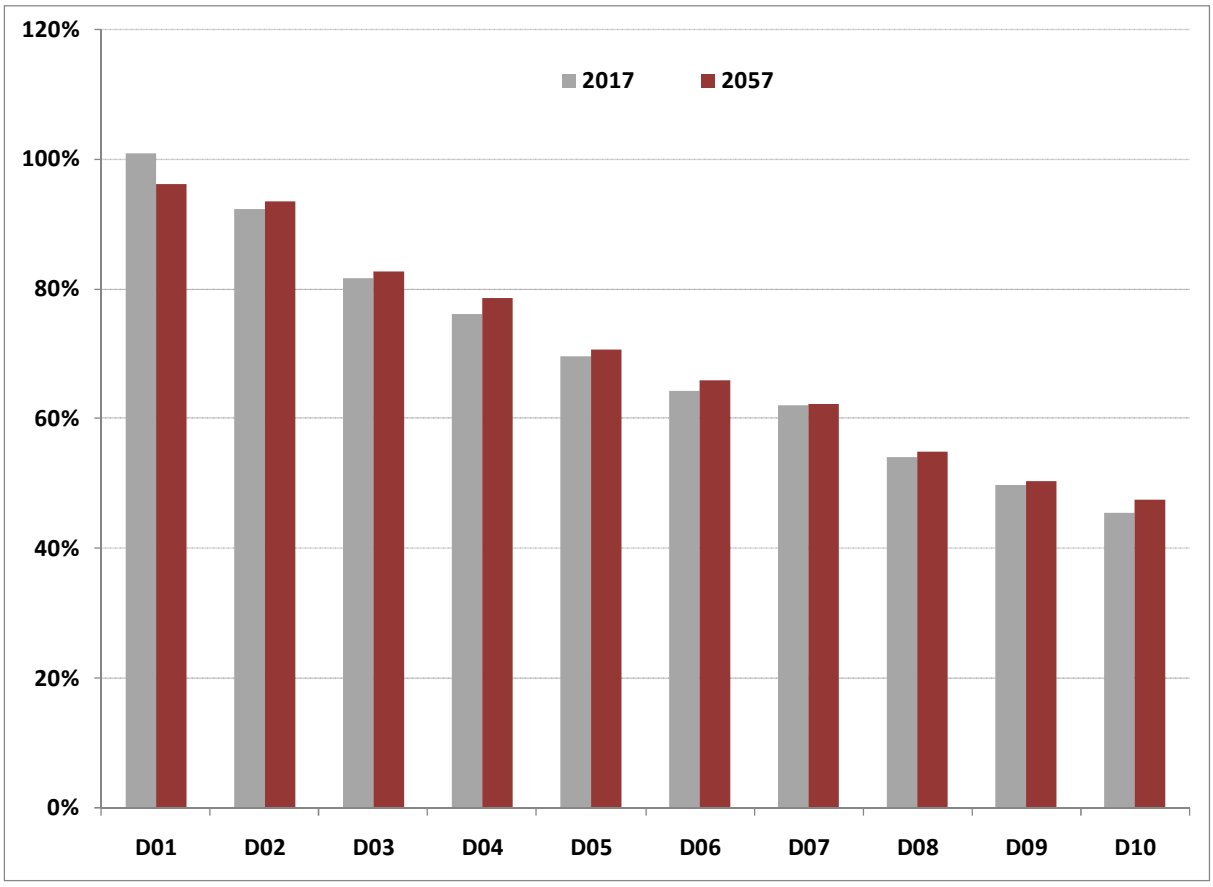
Importantly, Chart 3 only shows averages. The different nature of these adequacy standards shows up better when they are examined across income deciles, as seen below in Chart 4 and Chart 5. (Note that the following two charts use income deciles with the latter measured

across lifetimes rather than at a point in time, making them a rather more robust indicator of the fairness impacts of the super system. This difference is explained and explored in Appendix B.)

A standard based on income or consumer spending relative to their pre-retirement equivalents draws on the theoretical antecedents in the work of Ando, Modigliani and Friedman who argued that individuals consider their well-being based on their estimates of that well-being over their entire lives.

Chart 4 below, which uses the 'relative to pre-retirement consumer spending' estimate of retirement income adequacy, falls as income rises.

CHART 4: ADEQUACY CHANGES BY DECILE OVER TIME – 'CONSUMPTION SPENDING' STANDARD

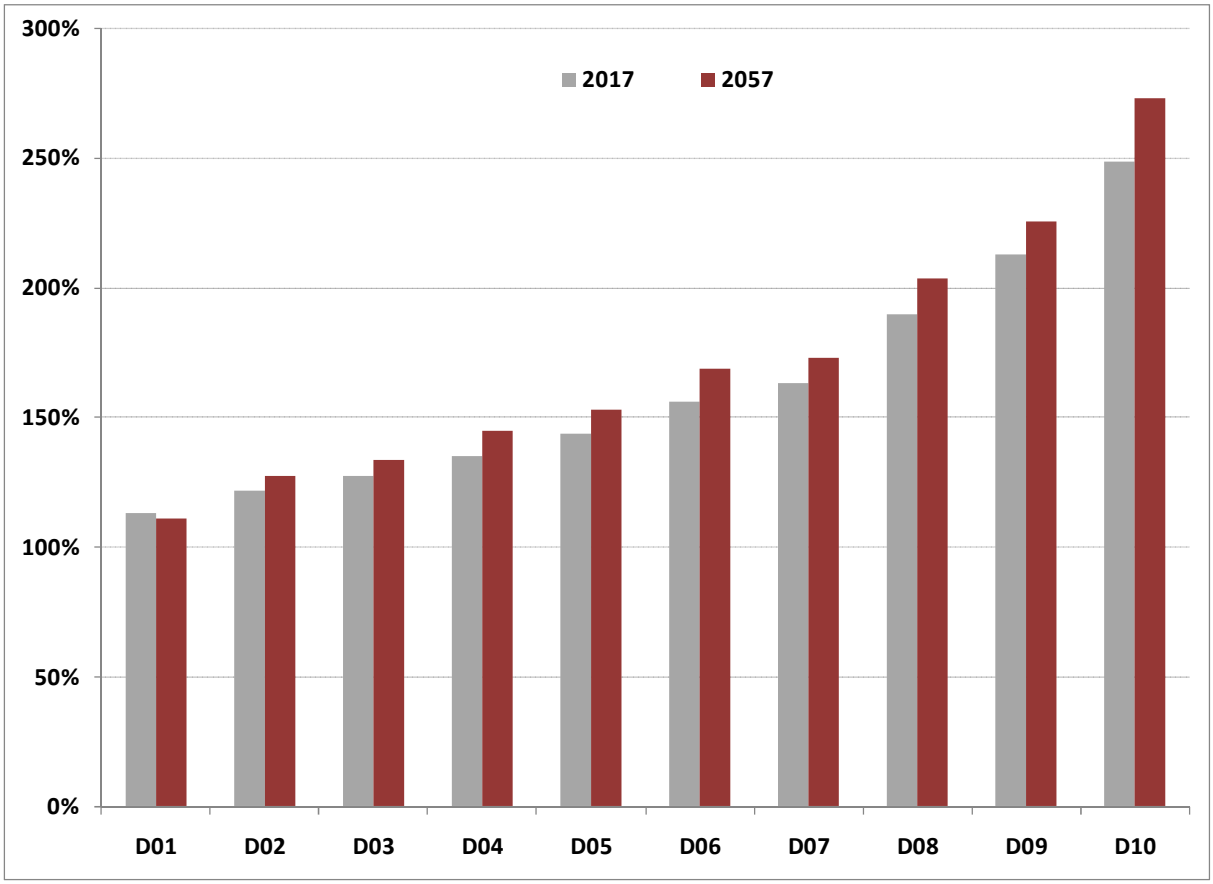


That is because the age pension provides a very important floor for people on lower lifetime incomes. If their income was low enough, then the pension provides a living standard (ability to consume relative to pre-retirement incomes) of close to 100% for those on the lowest lifetime income decile.

In contrast, Chart 5 uses the 'modest but adequate' estimate of retirement income adequacy. It rises as income rises, providing a more intuitive ability to assess the fairness of the outcomes expected from current superannuation system policy settings.

In 2004, Treasury[2] suggested *"Analysis of the baby boomers, who have not had the benefit of the full SG in place throughout their working lives, shows that a single person on median earnings (receiving SG contributions from 1992 onwards) retiring at age 65 in 2010 or later, should reach or exceed the Westpac/ASFA 'modest but adequate' retirement budget."*

CHART 5: ADEQUACY CHANGES BY DECILE OVER TIME – 'MODEST BUT ADEQUATE' STANDARD



Although they did not calculate an estimate, they implied that someone retiring in the mature superannuation system would therefore do rather better still.

Developments since then would presumably have moved Treasury's estimated replacement rates on an MBA basis higher still (personal income tax cuts, the abolition of benefits tax and increased benefits to self-funded retirees, and more generous withdrawal rates of pension entitlements.)[3]

[2] George Rothman and Cliff Bingham, *Retirement income adequacy revisited*, Paper presented to the Twelfth Colloquium of Superannuation Researchers, University of New South Wales, July 2004, Retirement and Income Modelling Unit, Department of the Treasury, at page 21.

[3] As markets boomed since the 2004Treasury paper and have since fallen back, the shift in markets between those two time periods is unlikely to have been a further major driver of changes in the assessment of adequacy.

Note that Access Economics' MBA estimates are different again to RIMGROUP's, as ours (1) include voluntary contributions to the super system (as is appropriate to do) and (2) Access Economics assumes faster rates of drawdown on lump sum assets.

Accordingly, our estimates on an MBA basis start at around 100% before rising to 175% over time.

Note that Chart 5 above shows an adequacy range of 110% of the MBA standard for the lowest lifetime income decile in 2057, rising to 280% of that standard for the top decile.

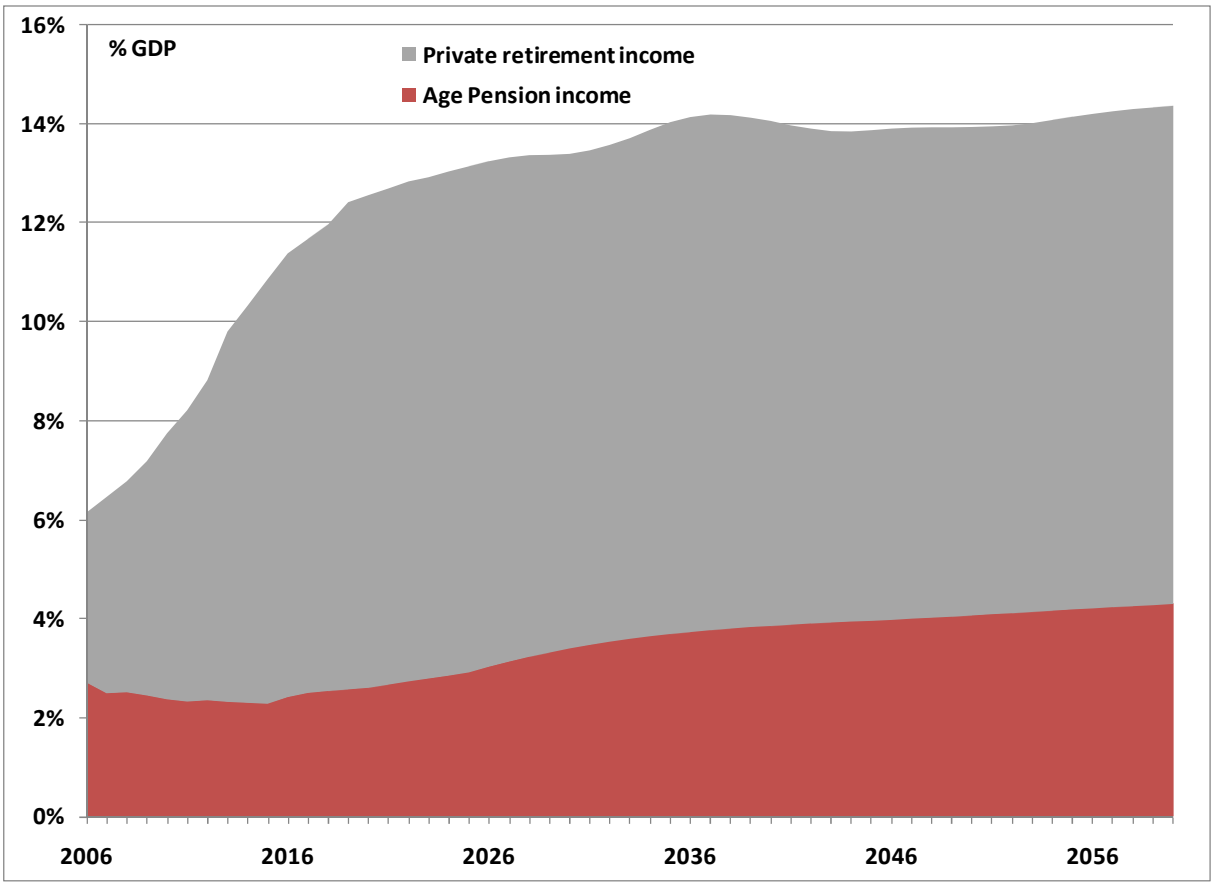
Remember that the full age pension (plus associated payments) provides an automatic floor of some 75% of the MBA standard for retirees who can potentially qualify for the pension.

Given that the lifetime average wage and salary income of the bottom lifetime income decile is $8,233 (total lifetime annual income for this group is $18,211 – see the discussion at Appendix B, and remember that incomes are distributed more evenly across lifetimes than they are at any given moment), then a combination of the 9% SG and the 6.25% assumption on annual returns is indeed sufficient to lift that to 110% via super income and the drawdown on super assets.

These measures are measuring different things, hence the different relativities between them (seen in Chart 3 above) are not particularly informative. More informative are the recent trends and the expected path these take in the future:

- **Recent trends**: To look at the first (consumer spending) measure, for example, the strong markets and (even more importantly) the strength in contributions ahead of the introduction of *Simpler Super* led to a surge in adequacy in recent years. After all, if people kept saving at the (artificially pumped up) rates evident ahead of the introduction of *Simpler Super*, then adequacy would indeed have been excellent. However, since that recent (and artificial) peak, markets have fallen and (even more importantly) so has the rate at which voluntary contributions are being made.
- That said, these estimates are benchmarked to estimates of today's wealth, meaning that the adequacy path in recent history is a smoothed version of the recent (rather more volatile) market developments.
- **The forecasts**: The forecasts soon settle to an adequacy path which is fairly flat from the first half of the 2020s (that is, these are 'projections' rather than 'forecasts'):
  - Note that, given that the super system is still maturing, that puts an upward bias to the adequacy measures over the next two decades.
  - So too do the preservation ages increases over time for both men and women.
  - Against that, expected further increases in life expectancy work the other way, as do the changes to the Age Pension age eligibility of women.

CHART 6: SOURCES OF RETIREE INCOME



2.2 OUTCOMES FOR GOVERNMENT

The balance between contributions tax and earnings tax affects the timing of government revenue.

Contributions tax is the largest component of superannuation taxes, with benefits taxes only contributing a small fraction of the total – a picture which remains true in the mature system. Note that, although most superannuation benefits are tax-free after the age of 60:

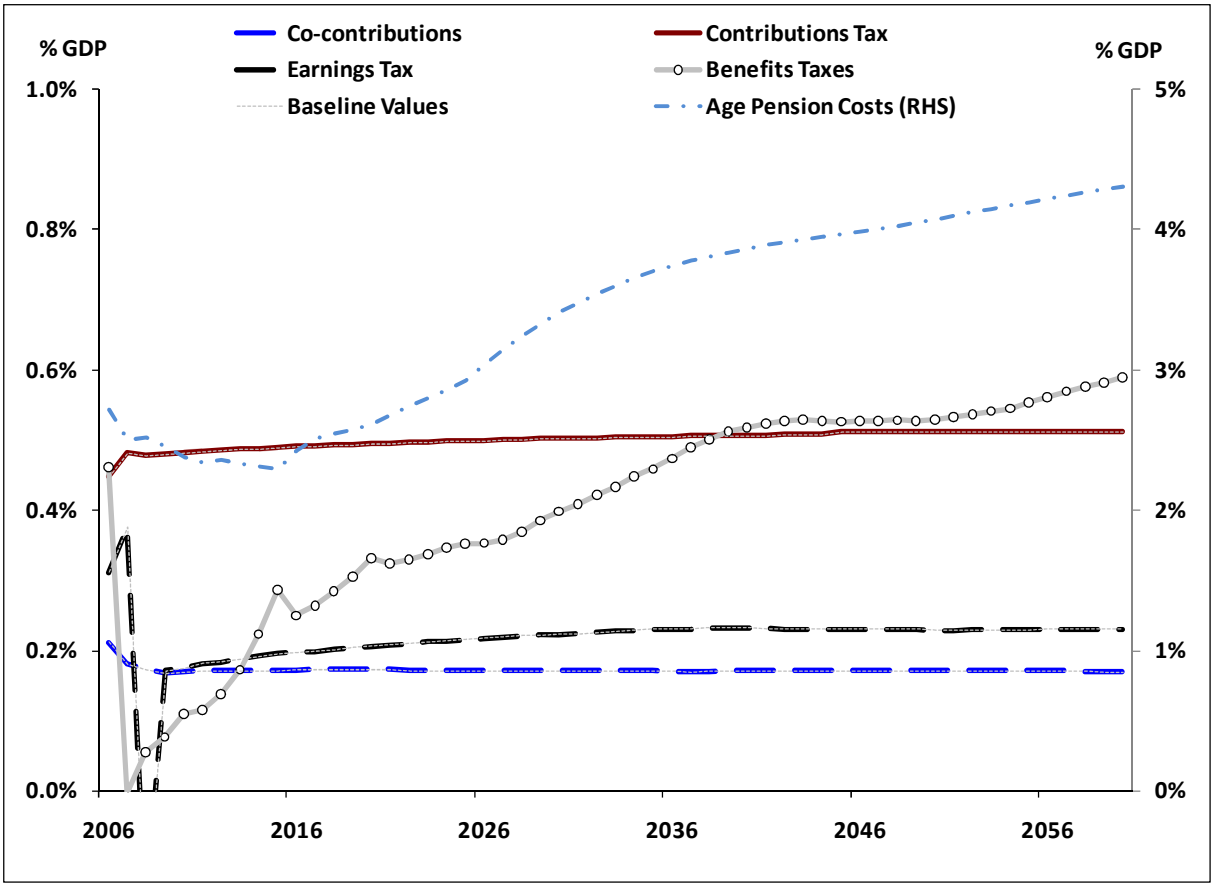
- Benefits taxes are payable by those who have untaxed superannuation (such as most public sector employees).
- Benefits tax is paid by those who withdraw their superannuation (presumably due to their retirement) before the age of 60.
- Income tax is payable on any benefits withdrawn as a lump sum on any subsequent earnings on those lump sums. In Access Economics' modelling framework, this flow of personal income tax payments is recorded under the heading of 'benefits taxes'.

Benefits tax projections presented here also include the taxation of income streams (including the effects of the income stream rebate where applicable), as well as interest income from lump sum withdrawals.

While many issues surrounding the timing of tax are essentially transitional, the long term balance informs opinions of the relative importance of each of the elements of the taxation of the superannuation system.

Chart 7 shows the projected value of Federal Government revenues and co-contributions as a share of GDP.

CHART 7: TAXES AND CO-CONTRIBUTIONS – BASELINE PROJECTIONS



2.3 A COMMONSENSE CHECK ON THE BASELINE RESULTS

Think of the mature superannuation system:

- If compulsory SG super of 9% is topped up by an additional 4 percentage points in voluntary super, then total contributions will be 13%. If wages and salaries are 55% of nominal GDP (not today, given the recent surge in the profit share which is now unwinding, but as an average over the longer term), then contribution flows may be expected to be around 13% x 55% = 7.2%.
  - In practice, Access Economics' estimate of contribution flows is a little higher, at 8.3%. As noted below, that figure is benchmarked so as to be close to APRA estimates, though the latter may be boosted by the inclusion of some pre-tax flows. (That said, the 8.3% includes Federal Government co-contribution payments.)
  - If wages are 55% of nominal national income, then 8.3% implies a contribution rate of 15% of wages and salaries, a figure higher than some other estimates (though lower than assumed in Rice-Warner modelling in this field, such as that in their *Superannuation Market Projections Report* of December 2007 (see

http://www.ricewarner.com/news_pdf/11Media%20Release_Super%20Projections%20Report_Dec%2007.pdf).

- If the average working life is 36 years, the SG is 9%, wages are 55% of national income, earnings on super assets equal nominal income growth for the economy as a whole (that is, there is a constant wealth to income ratio), the contributions tax is 15%, earnings taxes are (an effective) 5%[4], then the stock of superannuation assets belonging to workers will settle at 36 x 9% x 55% x (100% - 15%) x (100% - 5%) = 131% of national income (compared with 98% as at mid-2008, and closer to 80% as of today).
- This figuring becomes more complex[5] when you allow for an Equity Risk Premium (ERP) of 1% per year to be earned on superannuation assets. Access Economics does not usually allow an ERP as that leads to a rising wealth-to-income ratio over time, a result we are not comfortable with, but has done so here to keep results more closely comparable with those of Treasury. Allowing for the latter means that, given a starting stock of super assets of some 80% of GDP would, after a 36 year working life, become equal to 80% x (1.01^36) = 114% of GDP – that is, allowing for an ERP of 1% per year adds a further 34% of GDP, raising the expected total to around 165% of GDP.
  - In practice, Access Economics' estimate of superannuation assets belonging to workers in the longer term is 162% of GDP.

2.4 COMPARISON OF ACCESS ECONOMICS' BASELINE WITH FEDERAL TREASURY'S

Federal Treasury's Retirement and Intergenerational Modelling and Analysis (RIMA) Unit has used its RIMGROUP model to estimate a 'baseline' view of the future of superannuation.

Those results were discussed in *Projecting The Distributions Of Superannuation Flows And Assets*, by Dr George Rothman and David Tellis, 4 July 2008.

The RIMGROUP model differs in a number of ways from Access Economics' *SuperSim* model, but it is useful to compare the baseline results from both models.

Chart 8 shows Treasury's forecasts of the future. It may be usefully compared with Chart 1, which shows the matching *SuperSim* model results.

These results are shown through to 2040-41, both because that is as far out as this particular RIMGROUP paper projected, and because that year marks close to maturity for someone working 36 years with an SG rate of 9%.

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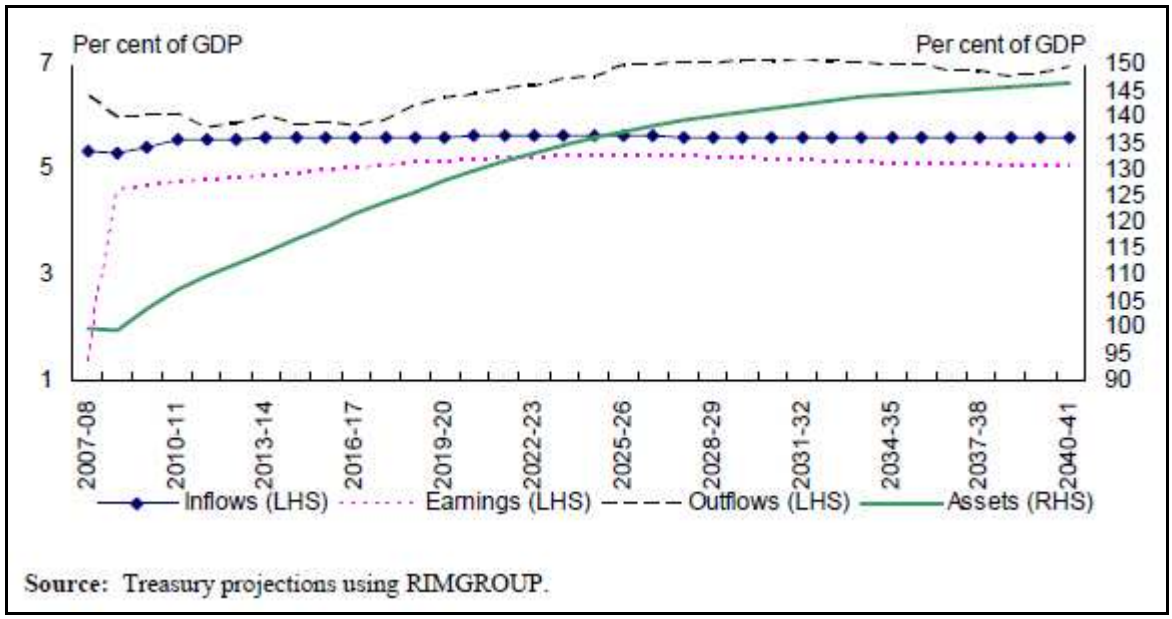
[4] Where 'effective' in this instance allows not merely for tax offsets available to super funds from the likes of franking credits, but also that earnings tax applies to less than the total stock of superannuation assets (that is, the earnings, rather than contributions plus earnings). Note that whereas the simple rule of thumb above uses an effective tax rate on earnings of 5% (and applies it to the total, rather than just the earnings component of the total), the matching RIMGROUP assumption is *"effective tax rates on the earnings of superannuation funds of 3 per cent for defined benefit funds, 4 per cent for established defined contribution funds, 5 per cent for SG funds and 10 per cent for rollover funds"* – see page 28 of Rothman and Tellis.

[5] Rather more complex than this deliberately simplistic description allows.

(As noted above, the Treasury work concentrates on the accumulation phase of super, while Access Economics' modelling also includes the super holdings of retirees. The latter continue to build well after 2040-41. We report here on as close as possible to a matching basis to Treasury.)

CHART 8: FEDERAL TREASURY BASELINE PROJECTIONS



Source: Treasury projections using RIMGROUP.

The differences are summarised in Table 1 below.

TABLE 1: DIFFERENCES BETWEEN ACCESS ECONOMICS' AND TREASURY BASELINE RESULTS

2040-41 estimates as a ratio to GDP	Treasury's RIMGROUP model	AE SuperSim model
Contributions - see note 1	5.4%	8.3%
Benefits - see note 2	7.0%	8.9%
Earnings - see note 3	5.0%	10.2%
Superannuation assets - see note 4	147%	162.2%
Replacement (consumption) - see note 5	81%	70.5%

- **Note 1:** The 2005-06 Australian Prudential Regulation Authority (APRA) and Australian Taxation Office (ATO) data show total contributions (concessional (employer) and non-concessional (member) contributions, plus the Government co-contribution) at 8.1% of nominal GDP in that year. Access Economics has contributions at 8.3% of GDP, because we have benchmarked against the APRA results. In contrast, RIMGROUP finds "that (contribution) inflows are projected to be a relatively flat 5 per cent of GDP" (see page 24 of RIMGROUP 2008). The RIMGROUP figure differs from the others noted here by being net of the 15% contributions tax (where that applies), which explains part but not all of the difference. It may be that some of the contribution flows as reported by APRA are pre- rather than post-tax, which could potentially bias the latter upwards (by perhaps 0.6 percentage points). This latter wedge may also be a further factor in explaining the differences here. In addition, the Access Economics figure also includes Federal Government co-contribution payments.
- **Note 2:** A simple way to think of the mature super system is one in which population is steady, and so is the age composition of the population. In addition, there is no price or wage inflation, no return on super assets, and all workers earn the same wage. In such a world, the only wedge between what you pay in as contributions (Treasury's

'inflows') and what you are paid out as benefits (Treasury's 'outflows') is due to taxes. That is why benefits will equal contributions less taxes in the mature system, as earnings simply keep pace with the growth in the nominal economy. Tax will therefore take out somewhere between 15% (the contributions tax rate) and 5% (the effective rate on earnings). As the RIMGROUP contributions estimate, at 5.4% of GDP, is already net of taxes, its benefits estimate might be expected to be similar. However, its earnings estimate of 7.0% is above nominal growth in the economy (implying a steady rise in the wealth to income ratio over time), which is why its benefits estimate is higher, at 7.0%. If we did not assume an ERP, then Access Economics' benefits estimate, at 7.3% of GDP, would be about 12% less than our contributions estimate, implying a sensible average tax rate. Once we allow for an ERP of 1%, our benefits estimate rises to 10.2% of GDP. The gap between contributions and benefits estimates is higher for Treasury (at 1.6% of GDP) than it is for Access Economics (at 1.3% of GDP) because their earnings assumption of 7% is above ours of 6.25% (equal to nominal GDP of 5.25% plus an ERP of 1%).

- **Note 3:** The RIMGROUP earnings assumption is "7 per cent per annum for the average pre-tax return of superannuation funds (after expenses of managing funds but before tax and administrative expenses are deducted separately on a per capita basis)". In contrast, Access Economics' is set to equal growth in nominal GDP plus an ERP of 1%, which effectively means close to 6¼% per year. As RIMGROUP's stock of super assets is 147% of GDP in 2040-41, and its earnings assumption is 7%, it is not clear why its earnings in 2040-41 are not 7% x 147% = 10.3% less an implied tax rate (leaving the total somewhere around 9% of GDP). Moreover, as earnings are a function of the stock of assets, it is even more unclear why the earnings and assets lines in Chart 8 do not carve out the same upward arc over time, with earnings simply 7% of assets. Access Economics' earnings estimate for 2040-41, at 9.2% of GDP, sits in line with its estimated asset stock of 162% of GDP (that is, 6.25% x 162% = 10.1%, less an implied tax rate of 12.7% = 8.9% of GDP).

- **Note 4:** Treasury's stock of super is 147%. On a like-with-like (that is, focussed on the accumulation phase alone, Access Economics' matching estimate is higher, at 162%. As discussed above, the Access Economics estimates seem to fit with expectations for these numbers based on simple rules of thumb. Our higher estimate is also consistent with the net impact of our figuring for contributions (which are higher than Treasury's).

- **Note 5:** Treasury's RIMGROUP considered replacement rates in the 2007 paper *The Adequacy Of Australian Retirement Incomes – New Estimates Incorporating The Better Super Reforms*, George P Rothman, Retirement and Income Modelling Unit, Department of the Treasury. That paper found that "*Replacement ratios are projected to rise significantly over time: in the case of workers from a little over 50 per cent currently to 70 per cent around 2020 and over 80 per cent by 2032*" (see page 10). Those estimated here are similar to 2020 (on the 'relative to pre-retirement consumer spending' adequacy measure), but drop behind the Treasury estimates thereafter. There are likely to be two key differences here – longevity projections and earnings assumptions. It would appear that, relative to Treasury's estimates, Access Economics assumes longevity grows faster but that earnings rates are lower. The longevity effect is relatively notable. We have longevity growing by sufficient to add about 12% to the average time spent in retirement across the modelling horizon. Other things equal (which they are not), that would imply a change in 'consumer spending' replacement rates over time such that 70% / (100% – 12%) = 80%, a figure closer to Treasury's.

3. THE ASSUMPTIONS IN THE BASELINE

Challenger Financial Services engaged Towers Perrin to model a number of annuity product-related scenarios to consider the impact of longevity risk and potential policy responses to longevity risk.

Towers Perrin assumed:

- An Equity Risk Premium of "a little over 4% per annum".
- A Fixed Interest Risk Premium of "a little under 1% per annum".
- A cash risk premium of "approximately -1% per annum.
- Fees of 1.5% a year for cash and Australian fixed interest, and 2% for Australian equities.
- Fees/margin on lifetime annuities of 0.85% per annum.
- Pension indexation equal to CPI + 2%.

Access Economics' model of the superannuation system – *SuperSim*, as described at Appendix A – assumes:

- A risk premium across all assets of 1% (meaning that returns on all assets are set at nominal GDP plus this risk premium, thereby averaging around 5¼% + 1% = 6¼%).
- Returns are modelled net of fees, including fees on annuity products (which are assumed to carry the same fees as all other assets modelled).
- Age pension indexation equal to CPI + productivity (1¾%) = 4¼% = AWE.
- Annuity indexation equal to CPI.

Note that, in the baseline run of the *SuperSim* model described in the previous chapter, retirees are assumed to take two-thirds of their super as a lump sum and the remaining third as an allocated pension.

The latter are drawn down at the mid-point of the previous drawdown range (that is, that applying in 2006-07 under the SIS regulations). Assets withdrawn as a lump sum are drawn down at twice this rate.

4. THE ANNUITY SIMULATIONS

Challenger asked Access Economics to examine the potential superannuation system-wide impact of policies aimed at addressing longevity risk.

4.1 WHO WINS? SOME OPENING COMMENTS ON ADEQUACY

There is rarely – if ever – a 'magic pudding' in economics, with everyone (including the Government) better off.

For example, Access Economics' previous analyses of changes to contribution tax indicate that **tax changes are very close to a 'zero sum game' if the behaviour of members does not change**.

Any change to tax rates or thresholds that is not offset by changes elsewhere in the system results in an increase or reduction in the overall burden of tax on the super system.

Although there may be significant timing changes that raise or lower tax revenue in the short term, any change to the overall tax burden is a transfer between the government and retirees.

In present value terms, the system is a zero sum game, with any benefit to either government revenue or retiree incomes coming at the direct expense of the other party.

A long run view of the system as a single 'pot' of funds (divided between the government and members) illustrates an important point: If behaviour is unchanged, then a change to super tax can only raise either government revenue or retiree benefits. In the long run it is not possible to increase both.

The *SuperSim* Model is able to distinguish between timing effects and shifts in the overall tax burden. This provides an opportunity to provide a more accurate indication of the impact of complex changes on both government revenue and retiree benefits.

But the annuity simulations considered here do imply important changes over the timing of income in retirement and, as a result of that, measures of income adequacy.

That is worth explaining upfront.

These simulations essentially involve retirees taking less money as lump sums, and more as annuities.

As Access Economics assumes that the lump sums are drawn down faster than the assets underlying annuities (or indeed allocated pensions) are drawn down, these simulations shift income in retirement to later rather than earlier periods.

That makes a lot of sense if the average Australian retiree is myopic – and hence has a tendency to save too little during their working lives, and to consume too fast in the first decade of their retirement.

There is some evidence of both these trends. Indeed, that goes to the heart of the justification for a compulsory superannuation system:

- One of the aims underpinning superannuation strategy is to make some people save who otherwise would not. If Australia's superannuation policies did not do that, then they would have no effect at all on retirement income adequacy.
- But the SG does have an effect because there are many people who do not save much – and would save less if they could.
- This is illustrated in the low coverage rates of superannuation prior to the introduction of the superannuation guarantee – particularly among low income earners.
- It is important to note that, whereas the legal incidence of the SG falls on employers, its economic incidence ultimately tends to fall on employees.
- That is because the benefit ultimately goes to employees (and, if wages didn't adjust, then the higher SG would lead to a permanent fall in the profit share, thereby reducing expected national output).
- Businesses make hiring decisions based on the total cost of employing a worker. As a result, **increases in the SG rate come over time at the expense of take-home pay rather than profits**.
- In effect, the SG arrangements are a system of forced savings designed to ensure that all Australian workers accumulate a minimum level of assets to support them in retirement.
- Therefore, even though it may not be obvious to individual employees, compulsory superannuation bites into discretionary income because the economic incidence ultimately falls on employees, and while households accumulate superannuation assets, it is wealth that cannot be borrowed upon to finance current consumption. Much further down the track, retirees will have increased incomes in retirement, increasing consumption, however that effect occurs slowly over the following 36 years.

In effect the SG arrangements are a flat 9% tax on income, with the money put aside to pay for social security for future retirees.

Accordingly, that makes SG more of a lever on the timing of living standards than it is on the distribution of living standards.

Does such a shift in timing make sense? You might not think so at first – after all, people are happier making their own choices than they are having governments make those choices for them.

The usual view of economists is that maximising the welfare of an individual will rarely require the intervention of governments. Such a view argues that individuals are capable of making their own choices about whether to save for retirement.

Yet maximising the welfare of a population might involve lifting long term savings. There are a number of 'externalities' that provide an argument for policies to increasing retirement savings.

- **The informational asymmetry externality:** Governments can be better informed about the future than households. Governments have been well aware of the coming squeeze on their finances for decades, but households haven't. The latter have therefore not saved with the thought in mind that pensions and subsidies to health care may be smaller in the future.
- **Myopia:** Regardless of how well informed households are relative to policymakers, the literature notes that households as a group have relatively high 'discount rates',

especially in some nations. Other things equal, that makes them undervalue the future, and hence under-invest in their retirement income for the future.

- **The Robin Hood externality:** The role of governments can be thought of as playing Robin Hood – they tax 'the rich' to spend on 'the poor'. But the rich typically save more from a given dollar than the poor. So the taxing and spending of governments can lower household saving below where it would otherwise be.
- **The public surplus externality:** Governments are not as good at saving as they should be – politics makes it hard for governments to run surpluses.

These features of the system push the choices of individuals away from what is best for the economy as a whole. They provide an argument for increasing retirement savings to make up for potential shortfalls in national saving brought about by the activities of governments, and a lack of foresight on the part of individuals.

They also point out that it may make sense for governments to effectively re-label public savings as private savings which are locked up until preservation age is reached (through 'co-contributions' to the super of low income earners for example).

However, the most compelling argument for policies to increase the level of retirement savings through the second and third 'pillars' comes as a direct result of the first.

Society ensures that every individual is able to achieve a basic standard of living in retirement. That commitment to the less fortunate is the fundamental goal of social welfare policy in Australia, and few would argue that it should be removed.

By providing a safety net for retirees, governments alter the retirement savings choices of individuals. Individuals are faced with a choice between receiving the aged pension and providing for their own retirement in order to enjoy a higher standard of living.

In effect, individuals can feel confident spending income now, safe in the knowledge that society will protect them from the worst of the consequences – a lack of income in retirement.

This **moral hazard externality** means that some people (predominantly low income earners) save less for their retirement than they would otherwise choose to save, providing a strong argument for government to help increase retirement savings.

Of course these same (or related) arguments in favour of slowing the timing of consumption hold in the retirement phase as well.

The average Australian retiree suffers from a degree of myopia: they are not well aware that (Access Economics' demographic model estimates that) the average man will live to be 9.8 years older than his Dad, while the average woman will live to be 8.2 years older than her Mum. Accordingly, they tend to take too much by way of lump sums and too little of their retirement income in the form of annuities.

Table 2 shows that there is no impact on the accumulation phase of the superannuation system from the implementation of this proposal – each of contributions, benefits and earnings are unchanged, as is the stock of 'superannuation assets':

- Rather, the difference lies in what retirees do after their retirement.
- In brief, measures of replacement rates improve notably. This occurs because it means slower consumption in retirement, and hence more income earned on savings during retirement – a key driver of the lift in retirement income adequacy as measured

here. Moreover, the assumption of an Equity Risk Premium – even the modest 1% assumed here – acts as a turbocharger on the implications of any delay of asset drawdowns by retirees on the adequacy of retirement incomes.

- A shift towards annuities (and away from lump sums) therefore means that net retirement income lifts steadily as the share of GDP, as it means that there is more money left in the 'pot' earning a return for longer.
- In addition, both the retirement income measures and replacement rate measures used in this report are calculated on average across the full span of retirement (this approach is similar to the average across retirees of all ages, at least in the long run 'steady state'). These measures therefore take rather more account of the future than retirees do in the base case above.
- By placing a higher weighting on incomes earned after lump sum withdrawals from super have already been largely drawn down, the replacement rates used here implicitly assess the timing of retirement income against the benchmark of an annuity drawdown pattern. As retirees consume more of their super later in retirement, the policy changes examined here tend to reduce the level of 'consumption in early retirement' relative to that benchmark.
- Note that the changed form of income receipts in retirement has minimal impacts on the costs of the publicly provided age pension in 2040-41, but more substantial effects in the shorter and the longer term (as discussed later, and seen in Chart 10).

TABLE 2: THE IMPACT OF THE ANNUITY SIMULATIONS (VERSUS THE BASELINE)

2040-41 estimates as a ratio to GDP	Baseline	30%	50%	100%	30% deferred
Contributions	8.3%	na	na	na	na
Earnings	10.2%	na	na	na	na
Benefits	8.9%	na	na	na	na
Superannuation assets	162.2%	na	na	na	na
Pension cost	3.9%	0.0%	-0.05%	-0.6%	-0.2%
Net retirement income	14.1%	0.3%	0.5%	0.3%	0.4%
Replacement (consumption)	70.5%	4.1%	6.4%	8.6%	2.9%
Replacement (MBA)	171.1%	10.7%	17.0%	23.3%	7.4%

4.2 THE 30% ANNUITY SIMULATION RESULTS

Chart 9 shows the size of the lift in retiree incomes. Note that 'net benefits at retirement' are little affected – rather, this proposal affects the retirement phase rather than the position at the end of the accumulation phase.

Note that the changed form of incomes in retirement is still counted as a private pension for the purposes of the public age pension means test. The shift out of a lump sum dominated environment to purchases of annuities means that, initially, there is a net win for retirees (and a net cost to the government) on the age pension: see Chart 10.

With the passing of time, and as noted above, this proposal would lower (public) age pension costs to governments.

CHART 9: EFFECTS OF THE 30% ANNUITY SIMULATION ON RETIREE BENEFITS AND INCOMES

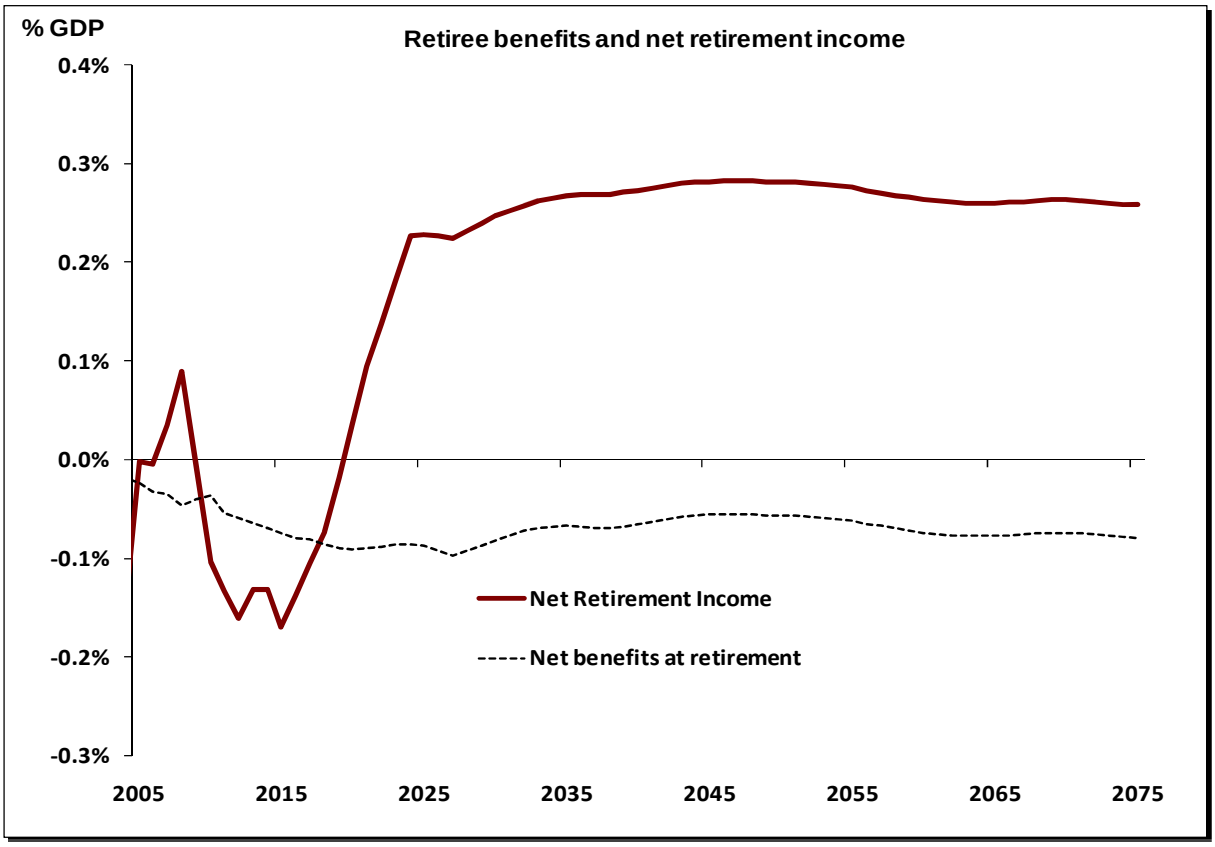
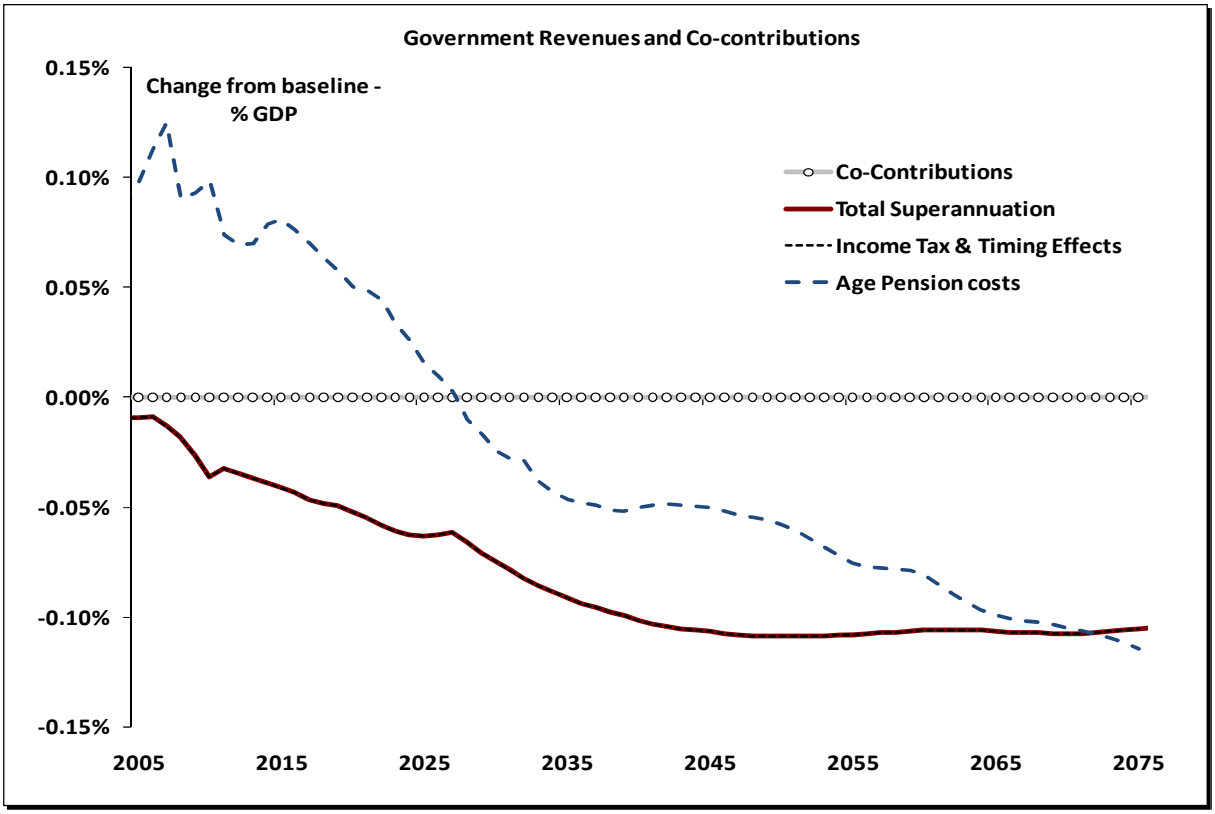


CHART 10: EFFECTS OF THE 30% ANNUITY SIMULATION ON GOVERNMENT TAXES AND CO-CONTRIBUTIONS



The strong adequacy gains seen in both the 'consumer spending' benchmark of adequacy (Chart 11) and the 'modest but adequate' benchmark (Chart 12) are partly a sign that annuity products allow retirees to cover part of their longevity risk.

CHART 11: EFFECTS OF THE 30% ANNUITY SIMULATION ON THE CONSUMPTION MEASURE OF ADEQUACY

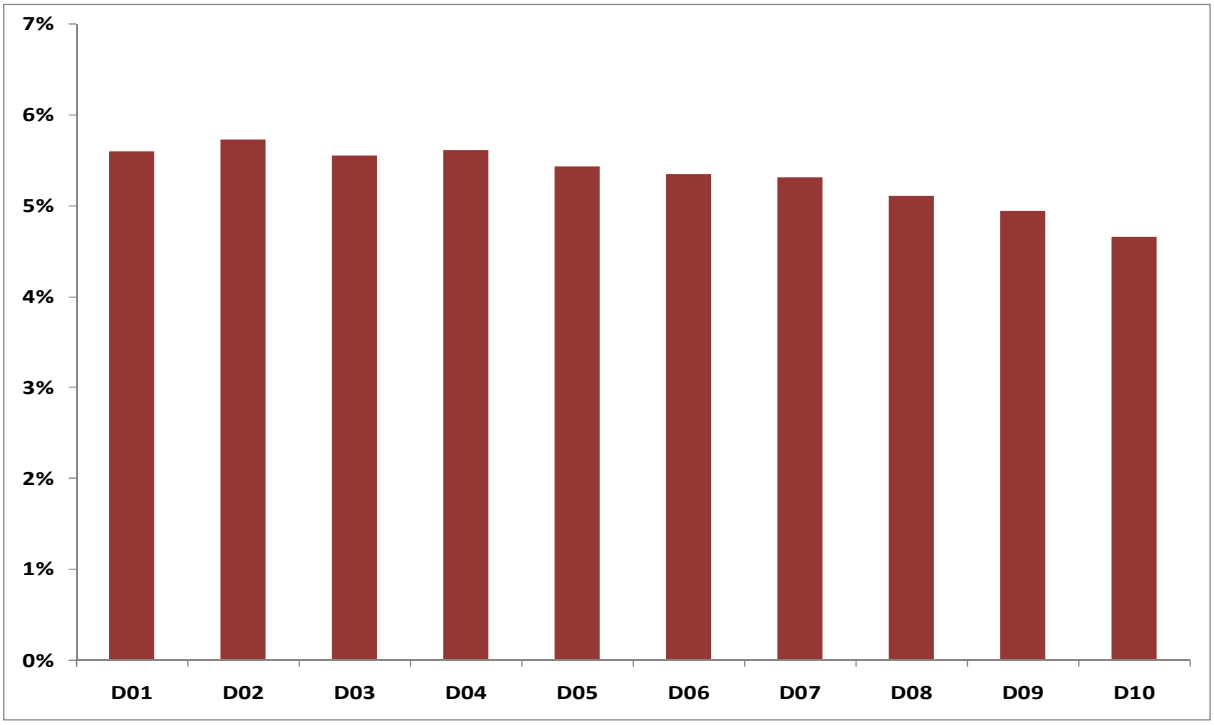


CHART 12: EFFECTS OF THE 30% ANNUITY SIMULATION ON THE 'MODEST BUT ADEQUATE' MEASURE OF ADEQUACY

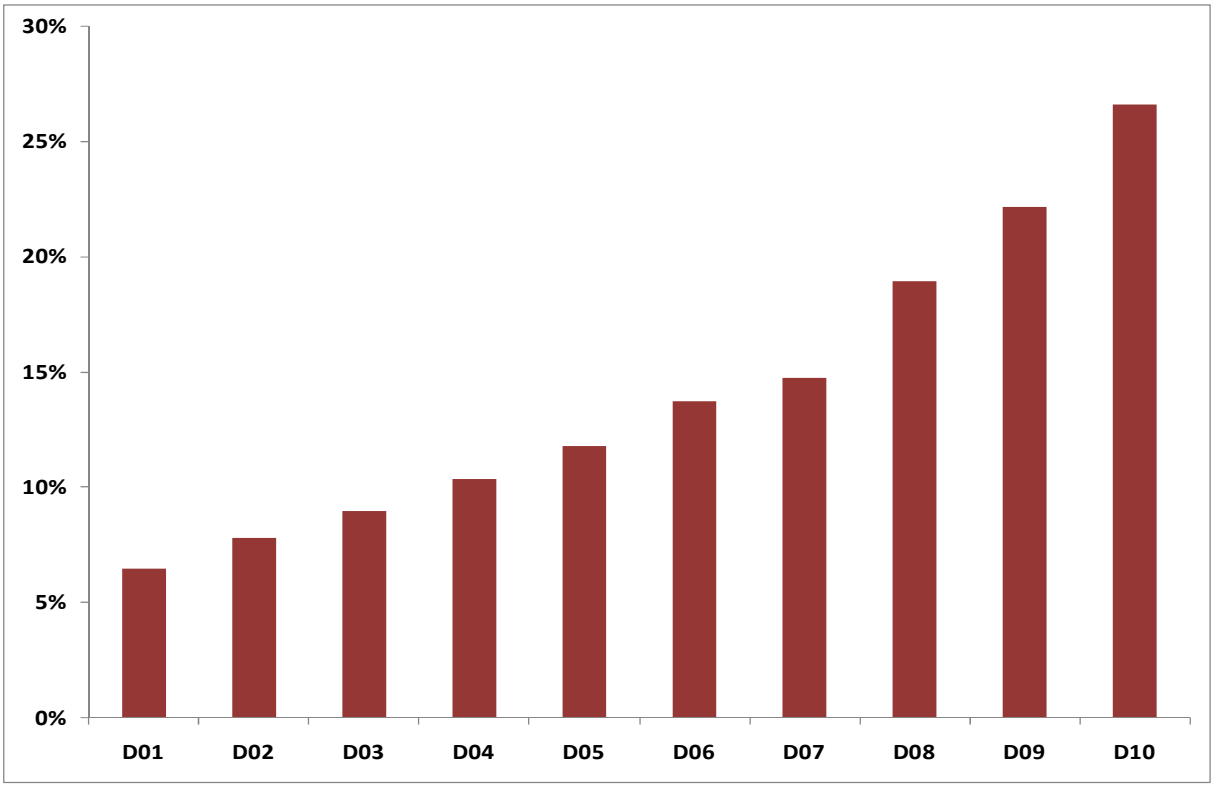
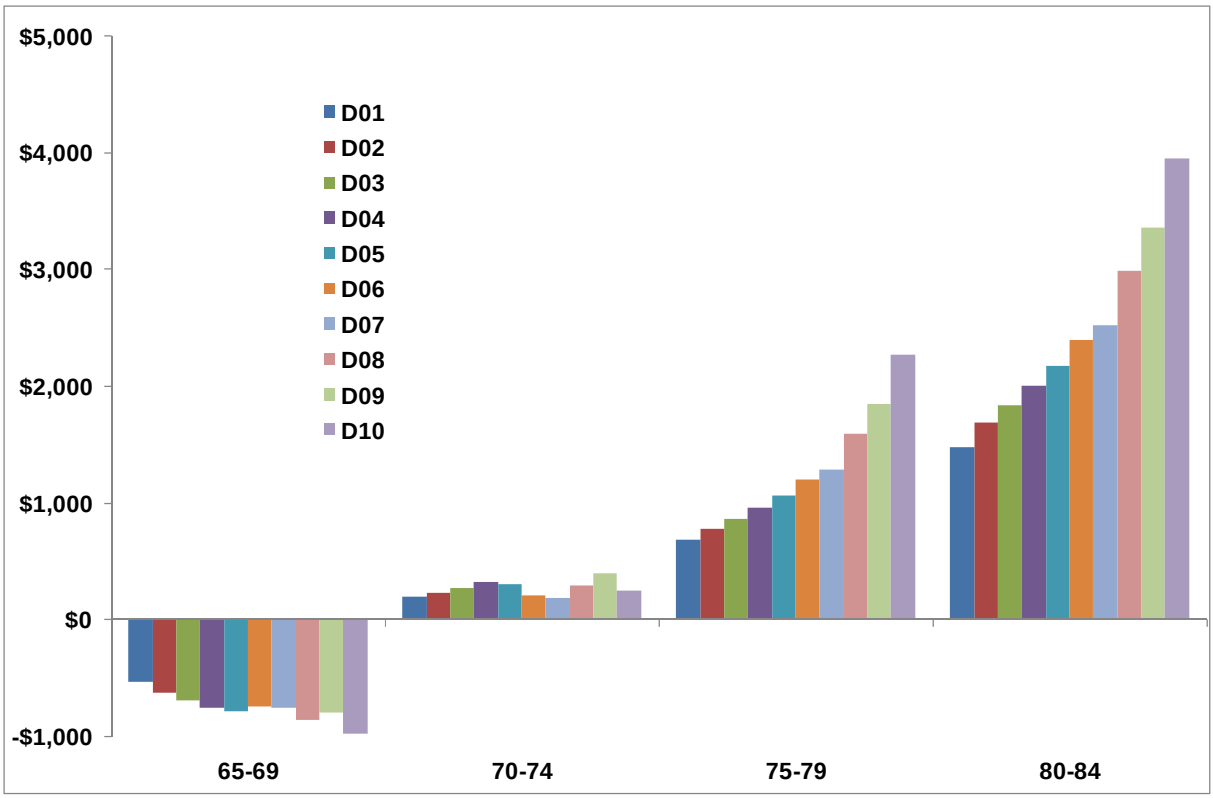


Chart 13 shows the effects of the 30% annuity simulation on gross private income by age as at 2040-41:

- Not surprisingly, the results are more beneficial for the longer lived.
- In absolute dollar terms, it also makes sense that the largest gains (measured in absolute dollars) go to those on the highest lifetime income deciles.

(As noted earlier, Appendix B teases out the differences between current income deciles and lifetime income deciles.)

CHART 13: EFFECTS OF THE 30% ANNUITY SIMULATION ON GROSS PRIVATE INCOME BY AGE AS AT 2040-41



4.3 THE 50% ANNUITY SIMULATION RESULTS

Not surprisingly, the 50% annuity simulation results show 'more of the same'.

The differences are not linear, given the non-linear impact of the likes of the pension income test, as well as the non-linear distribution of super assets and assets held outside the super system.

That said, many of the results are similar.

Chart 14 shows a larger lift in retiree incomes, while Chart 15 shows a larger impact on the Federal Government's accounts.

The 'modest but adequate' benchmark (see Chart 17) shows the dollars rising alongside lifetime incomes. The adequacy gains seen in the 'consumer spending' benchmark of adequacy (Chart 16) are smaller for the higher deciles, though not notably so.

CHART 14: EFFECTS OF THE 50% ANNUITY SIMULATION ON RETIREE BENEFITS AND INCOMES

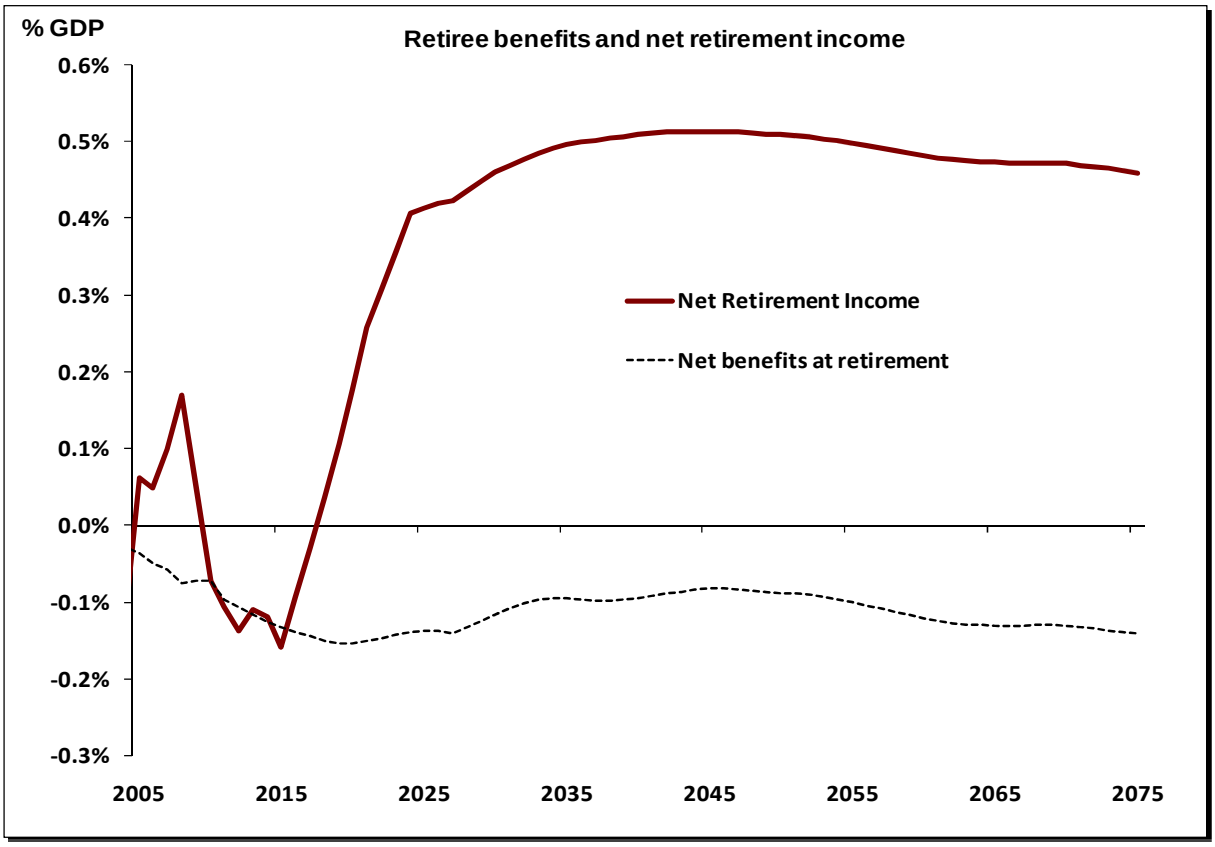


CHART 15: EFFECTS OF THE 50% ANNUITY SIMULATION ON GOVERNMENT TAXES AND CO-CONTRIBUTIONS

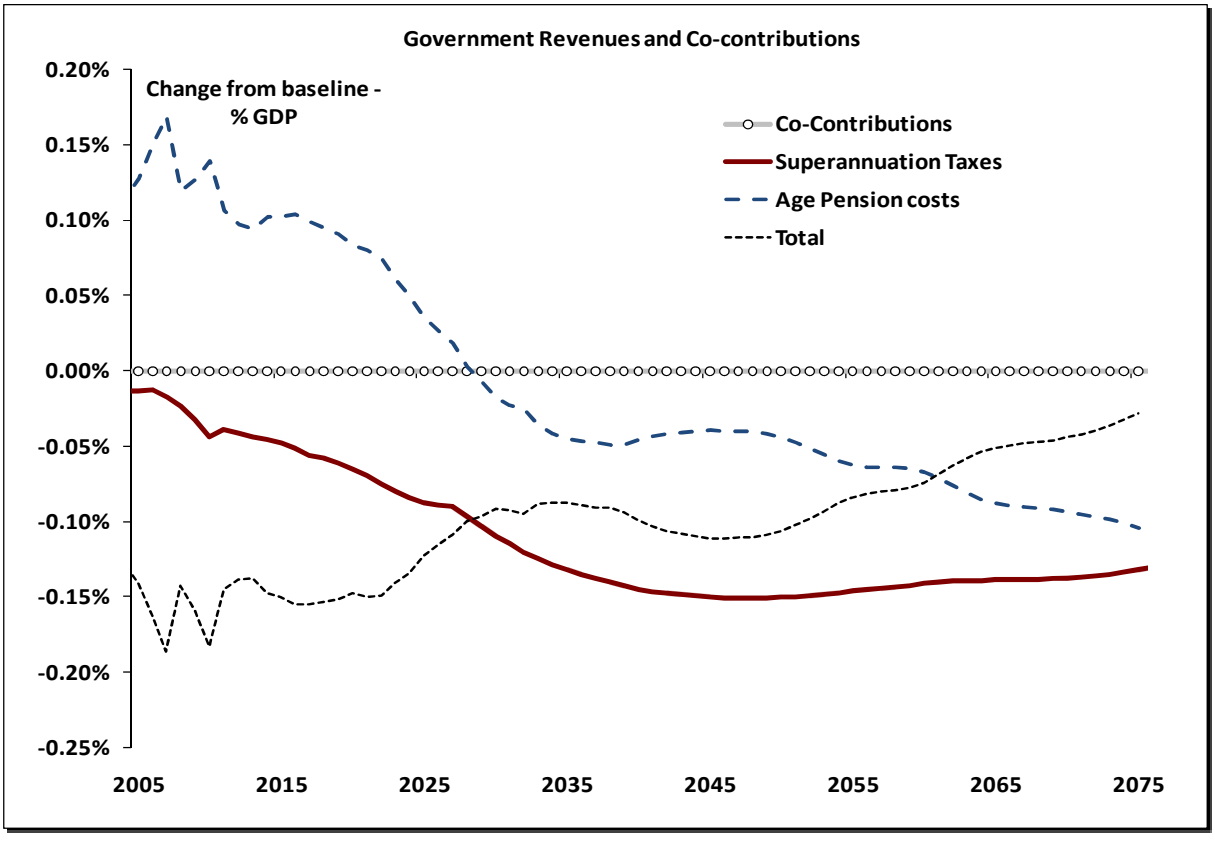


CHART 16: EFFECTS OF THE 50% ANNUITY SIMULATION ON THE CONSUMPTION MEASURE OF ADEQUACY

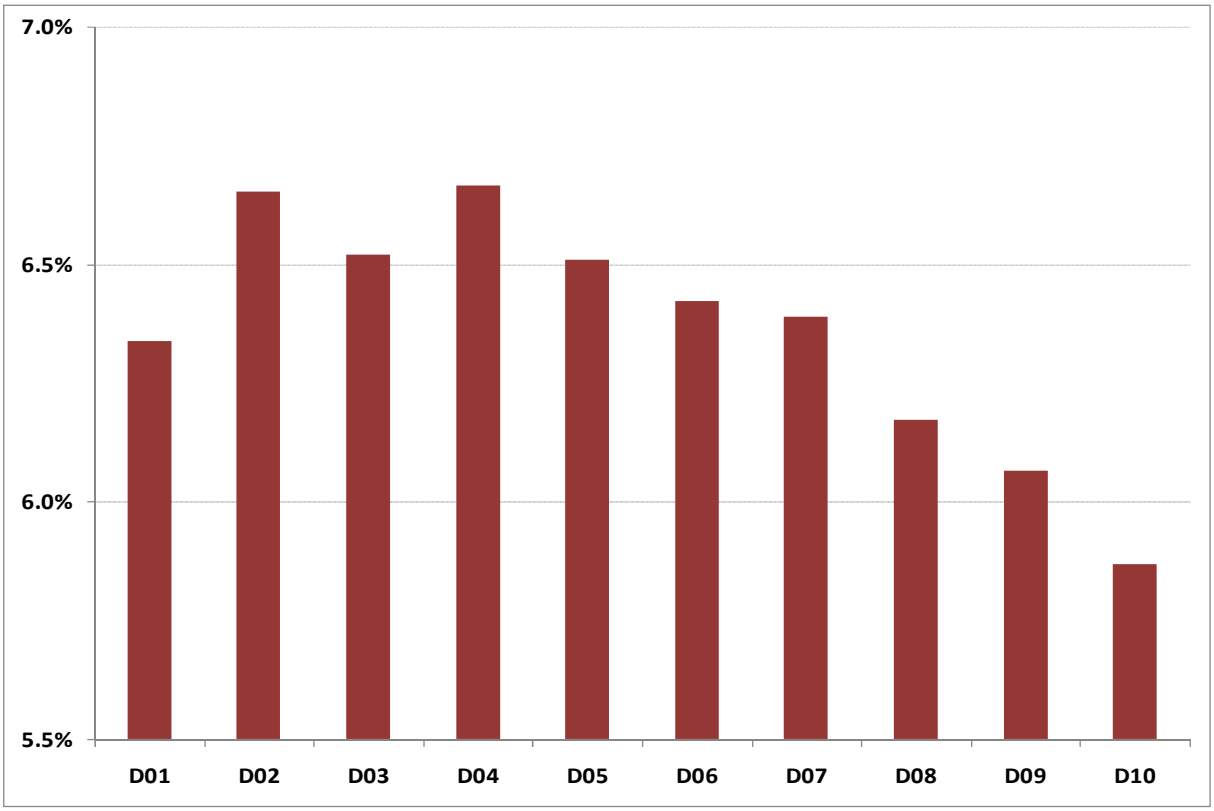


CHART 17: EFFECTS OF THE 50% ANNUITY SIMULATION ON THE 'MODEST BUT ADEQUATE' MEASURE OF ADEQUACY

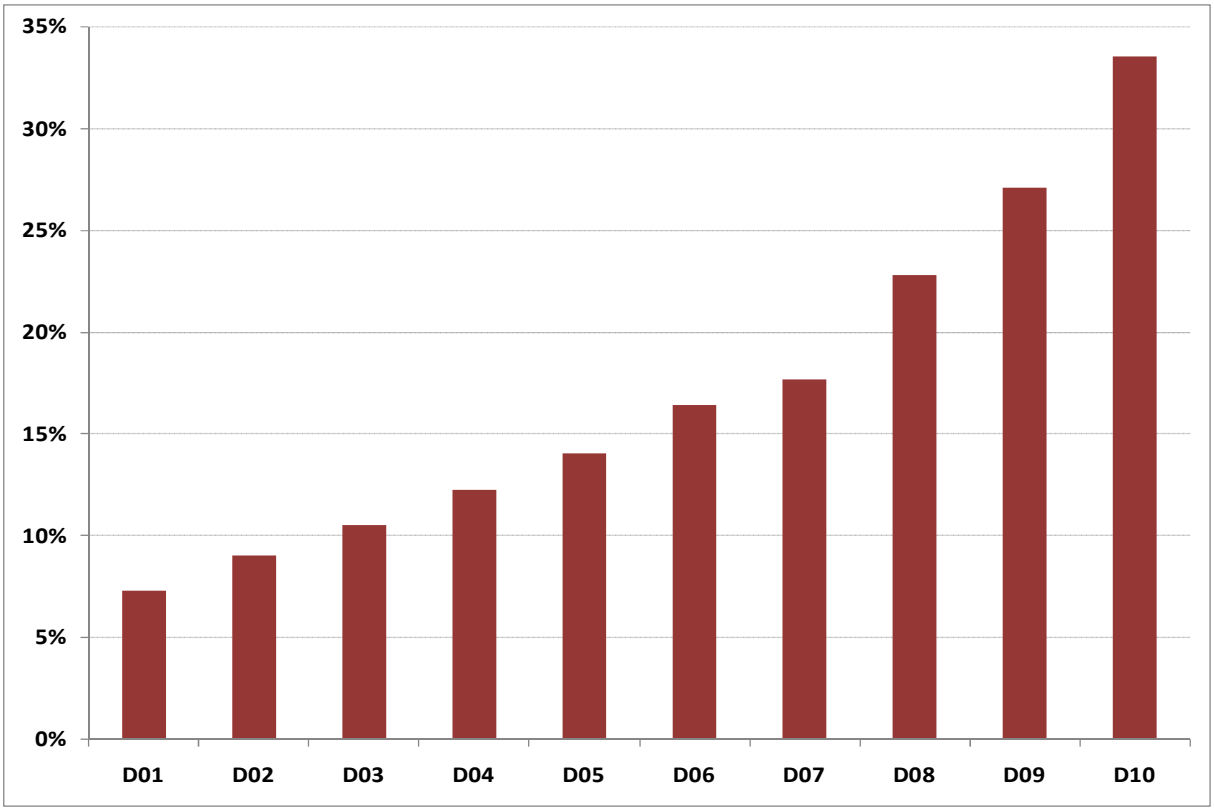
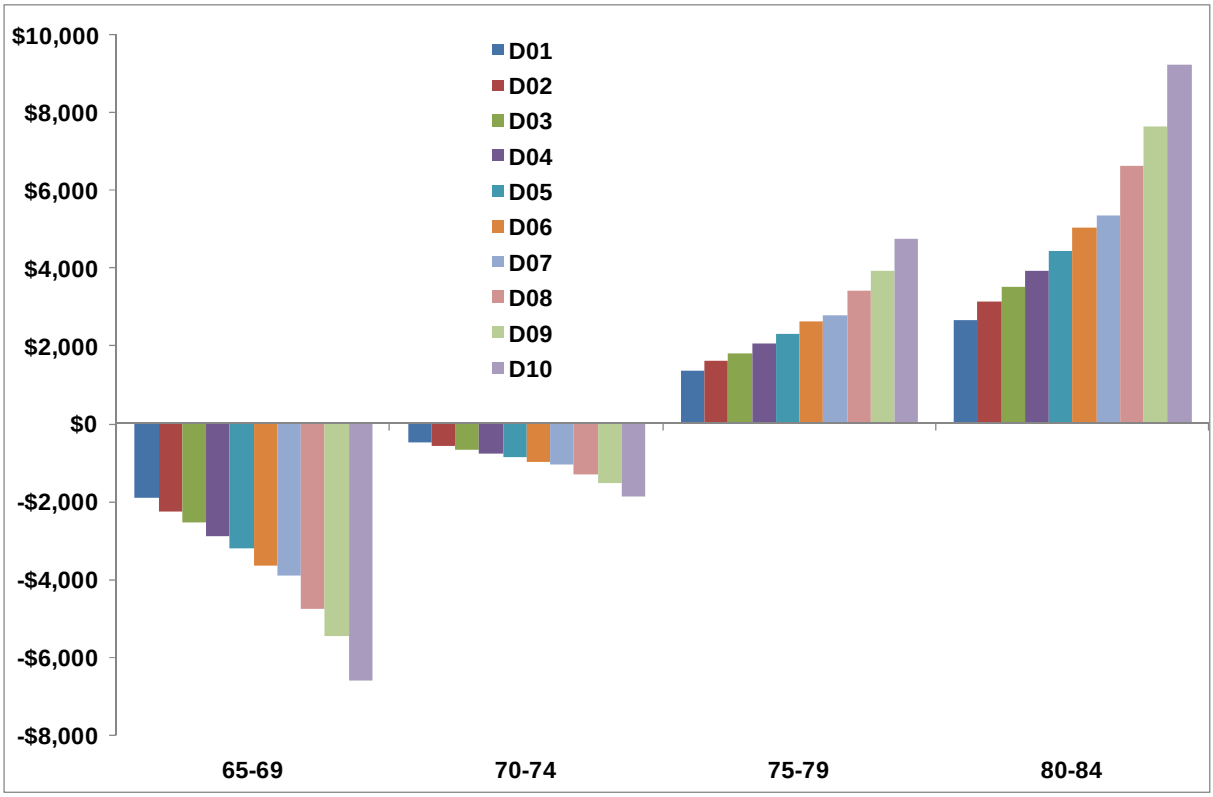


Chart 18 shows the effects of the 50% annuity simulation on gross private income by age as at 2040-41.

CHART 18: EFFECTS OF THE 50% ANNUITY SIMULATION ON GROSS PRIVATE INCOME BY AGE AS AT 2040-41



4.4 THE 100% ANNUITY SIMULATION RESULTS

The 100% annuity simulation results are again 'more of the same'.

Chart 19 shows a larger lift in retiree incomes, while Chart 20 shows a larger impact on the Federal Government's accounts.

The 'modest but adequate' benchmark (see Chart 22) shows the dollars rising alongside lifetime incomes. The adequacy gains seen in the 'consumer spending' benchmark of adequacy (Chart 21) are smaller for the higher deciles, though not notably so (the scale on the chart emphasises the differences).

CHART 19: EFFECTS OF THE 100% ANNUITY SIMULATION ON RETIREE BENEFITS AND INCOMES

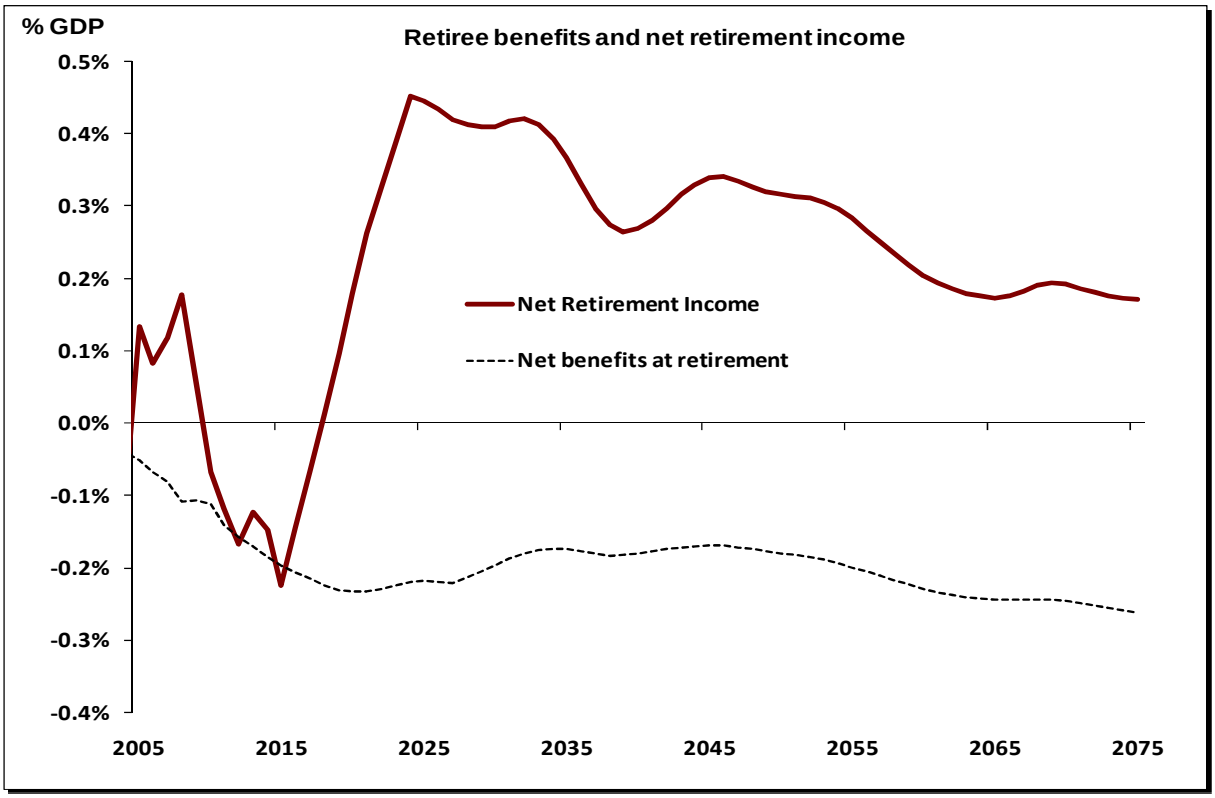


CHART 20: EFFECTS OF THE 100% ANNUITY SIMULATION ON GOVERNMENT TAXES AND CO-CONTRIBUTIONS

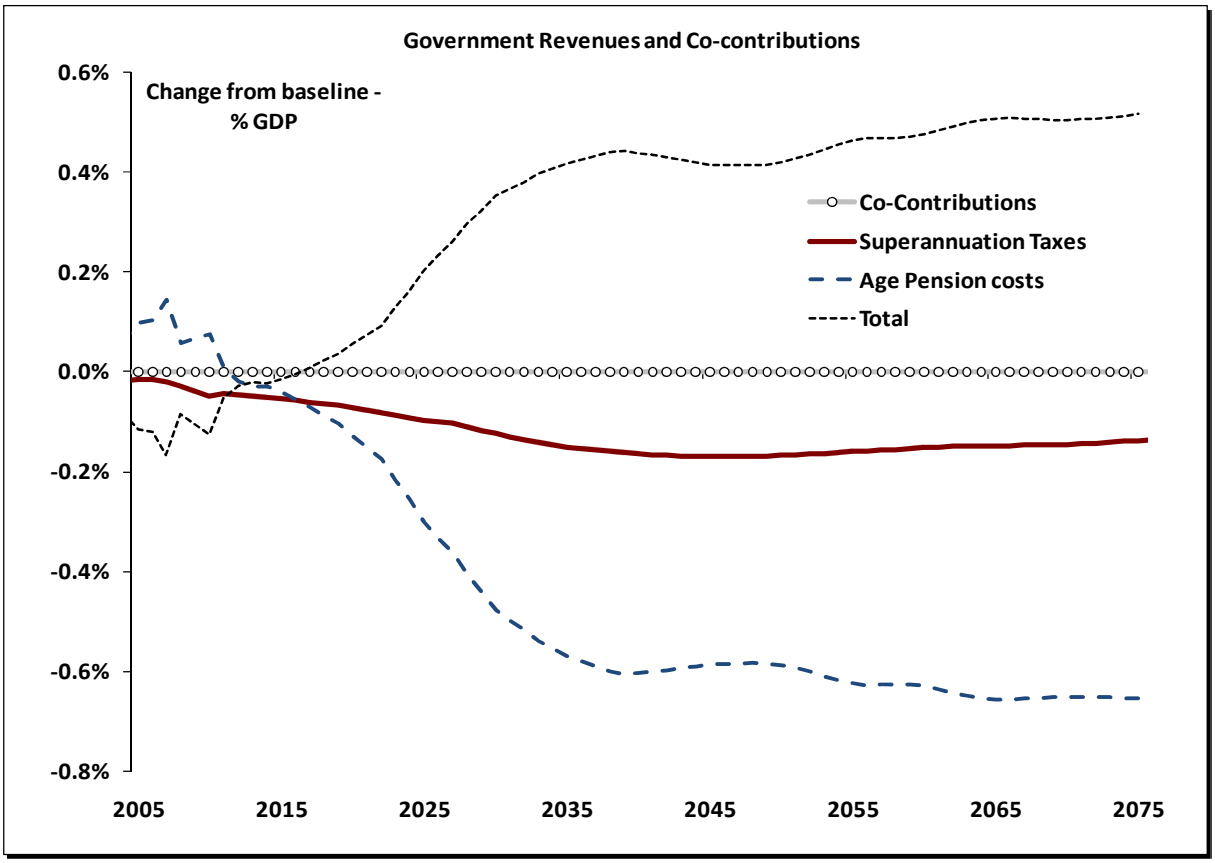


CHART 21: EFFECTS OF THE 100% ANNUITY SIMULATION ON THE CONSUMPTION MEASURE OF ADEQUACY

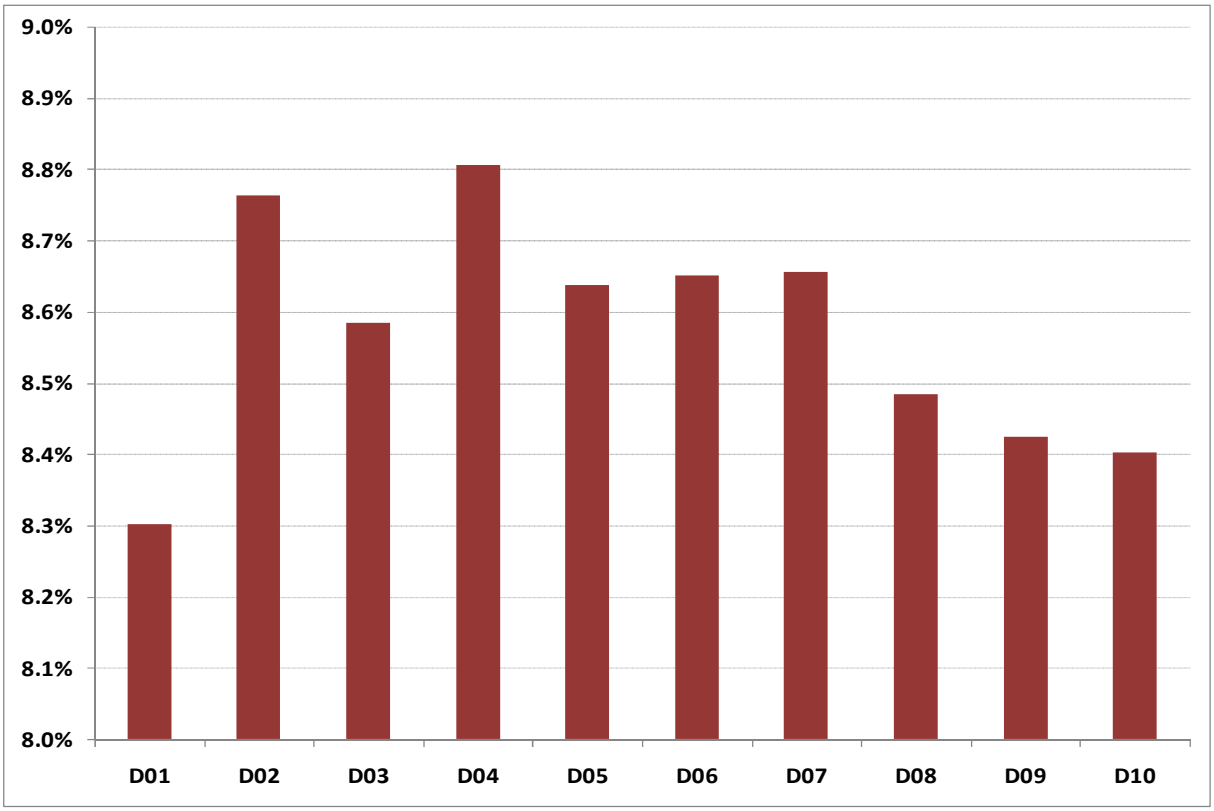


CHART 22: EFFECTS OF THE 100% ANNUITY SIMULATION ON THE 'MODEST BUT ADEQUATE' MEASURE OF ADEQUACY

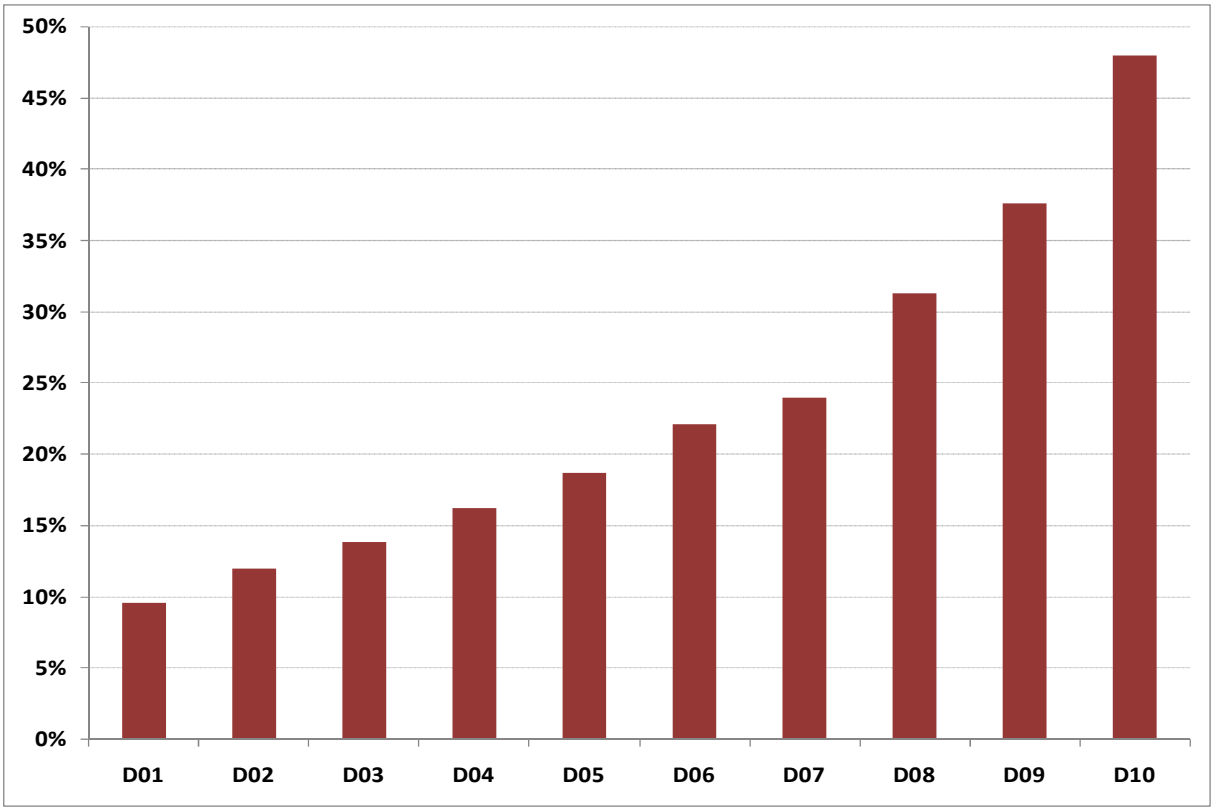
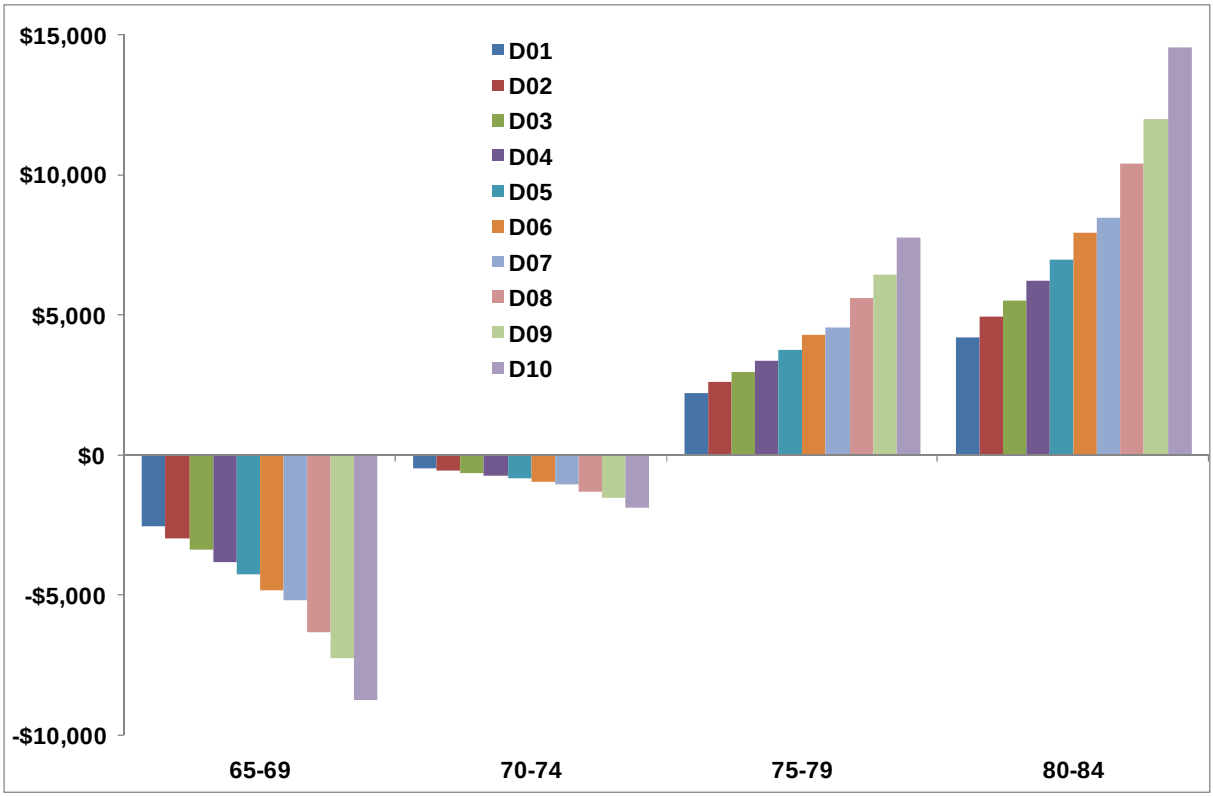


Chart 23 shows the effects of the 100% annuity simulation on gross private income by age as at 2040-41.

CHART 23: EFFECTS OF THE 100% ANNUITY SIMULATION ON GROSS PRIVATE INCOME BY AGE AS AT 2040-41



4.5 THE DEFERRED 30% ANNUITY SIMULATION RESULTS

The deferred 30% annuity simulation results are different to those for the three basic annuity simulations above, reflecting a key difference in the timing of retirement incomes.

In essence, this scenario provides a larger 'bang for the buck' in covering retirees' longevity risk, with that coming at the expense of forgone income over the early years of retirement.

By delaying payment to retirees until 10 years after retirement, this scenario acts to reduce overall retirement incomes as measured by Access Economics' *SuperSim* model.

The short term fall in retirement incomes seen in Chart 24 is a function of the maturing of the super system. It comes about as new retirees receive less income in this scenario than in the immediate annuity cases above, and less still than in the baseline.

Early in the projection period, new retirees represent a significant share of overall retirement income, meaning that the combination of more income later in retirement, and significantly less income in the early years of retirement results in a net negative on the overall measures reported here.

In the long run 'steady state' the deferred income streams paid to older retirees more than offset this reduction.

CHART 24: EFFECTS OF THE DEFERRED 30% ANNUITY SIMULATION ON RETIREE BENEFITS AND INCOMES

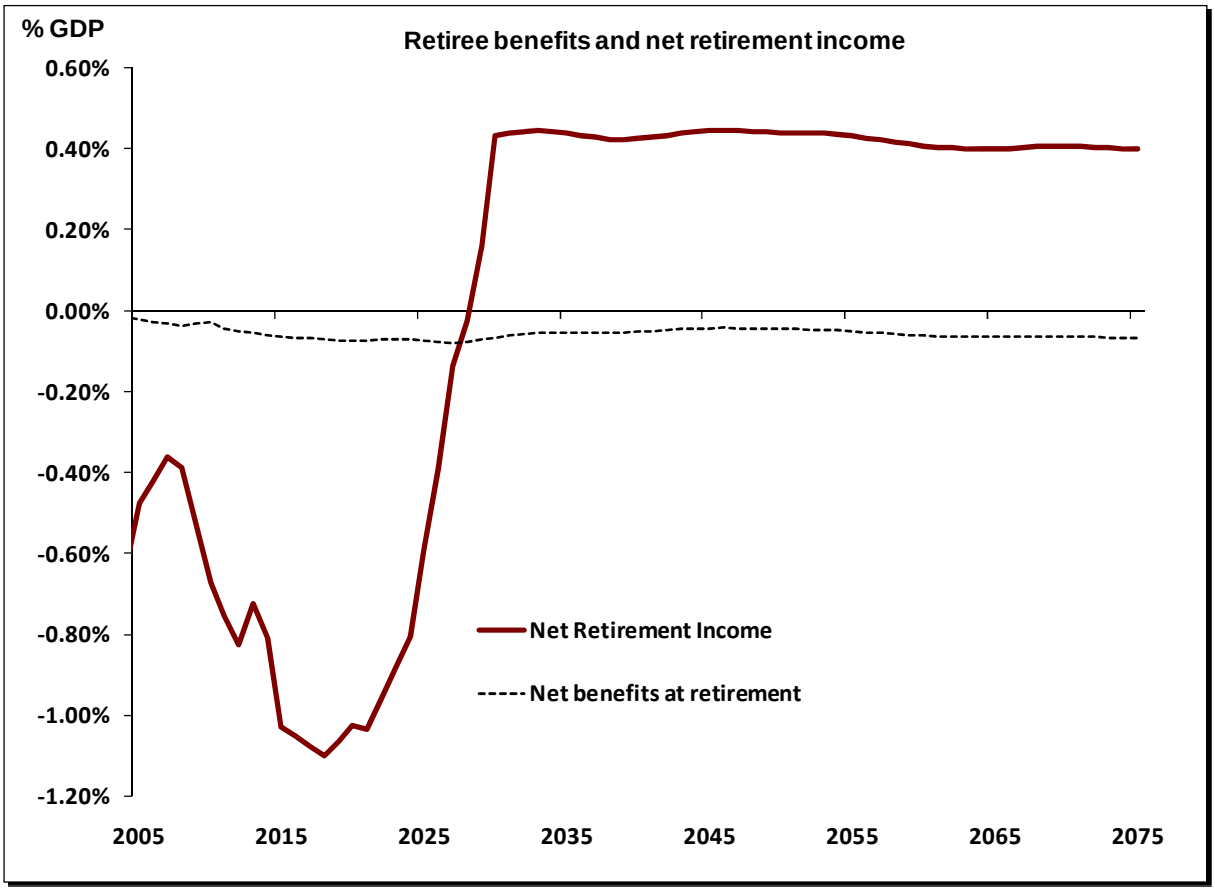
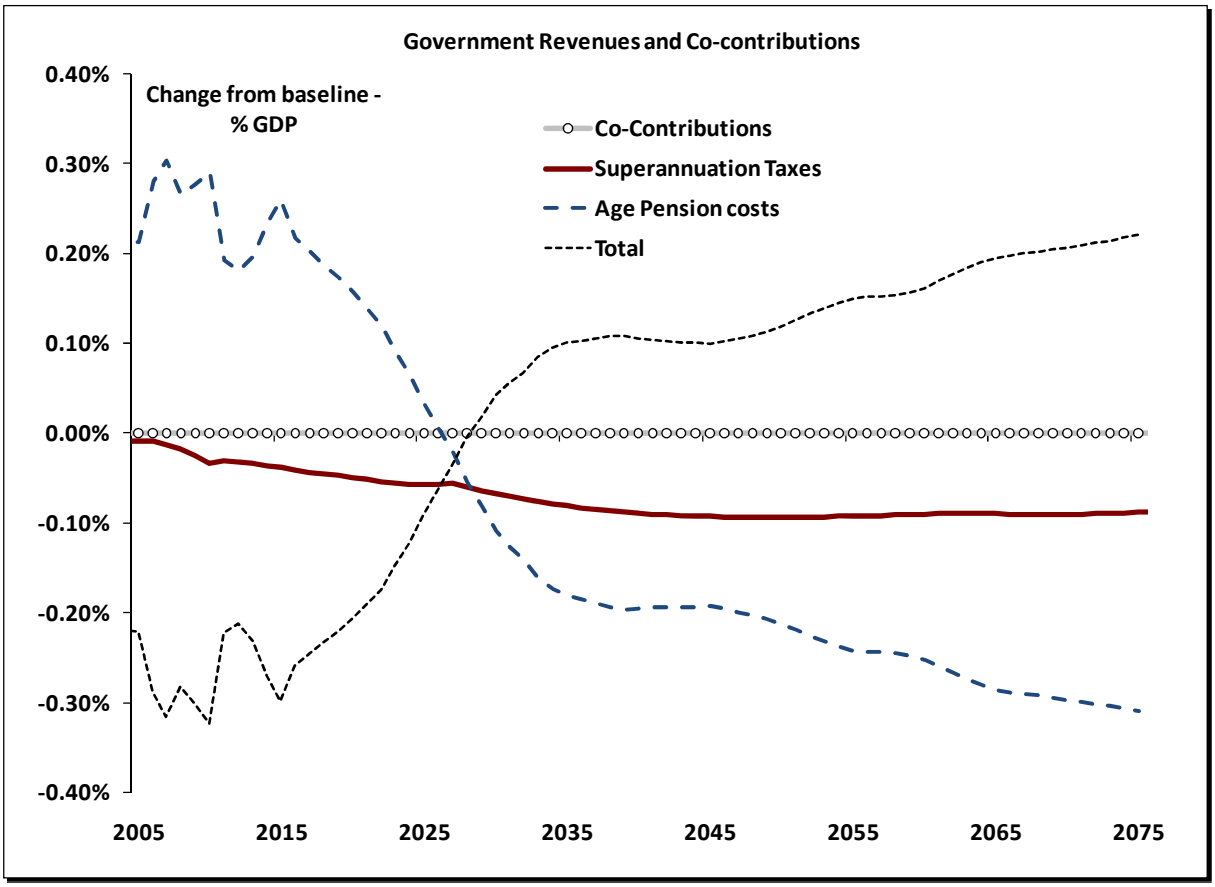


Chart 25 shows a larger impact on the Federal Government's accounts than in the immediate annuity case, reflecting a greater relative shift in the timing of retirement incomes.

CHART 25: EFFECTS OF THE DEFERRED 30% ANNUITY SIMULATION ON GOVERNMENT TAXES AND CO-CONTRIBUTIONS



The 'modest but adequate' benchmark (see Chart 27) shows the dollars rising alongside lifetime incomes. The adequacy gains seen in the 'consumer spending' benchmark of adequacy (Chart 26) are again smaller for the higher deciles.

CHART 26: EFFECTS OF THE DEFERRED 30% ANNUITY SIMULATION ON THE CONSUMPTION MEASURE OF ADEQUACY

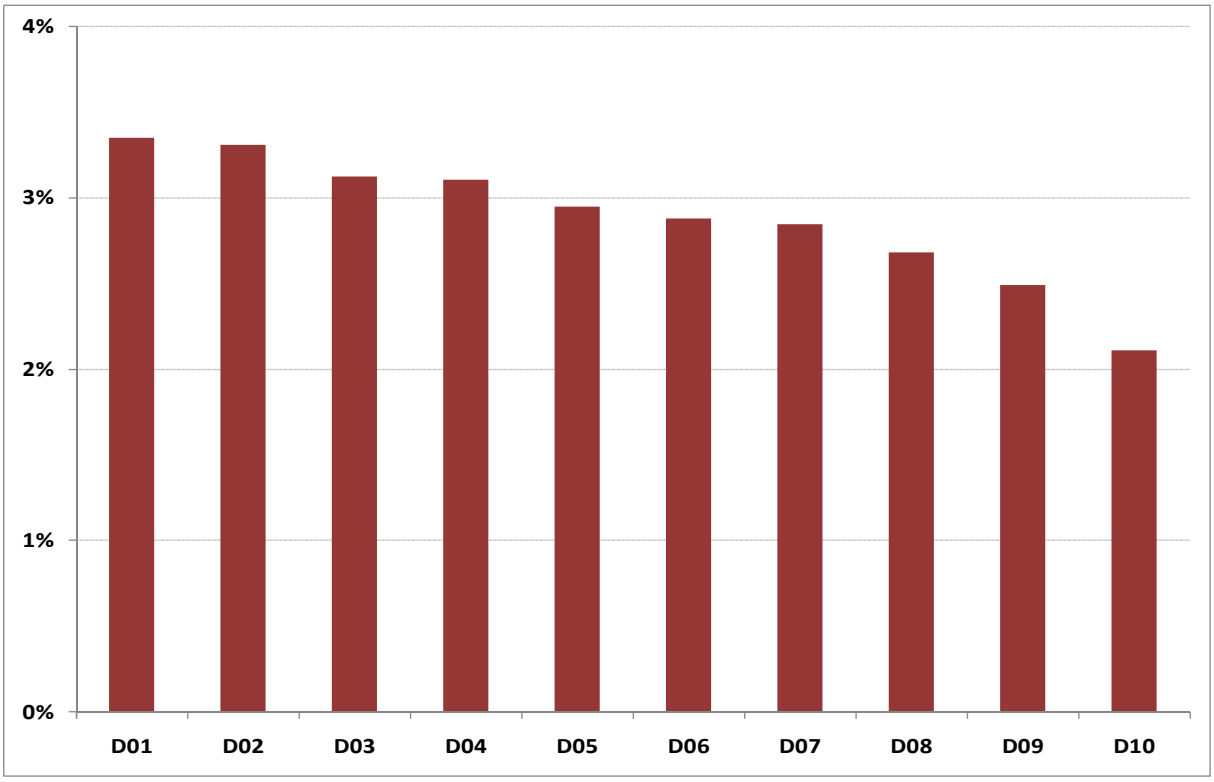


CHART 27: EFFECTS OF THE DEFERRED 30% ANNUITY SIMULATION ON THE 'MODEST BUT ADEQUATE' MEASURE OF ADEQUACY

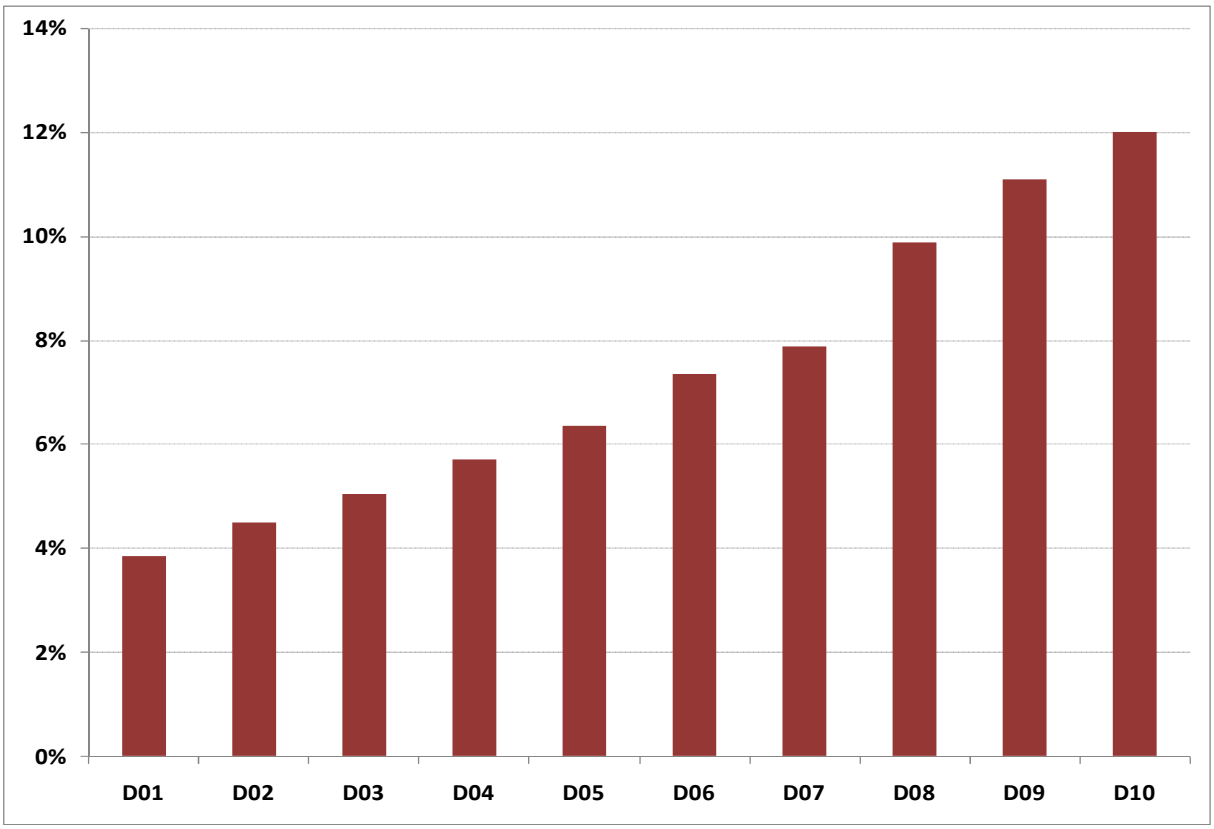
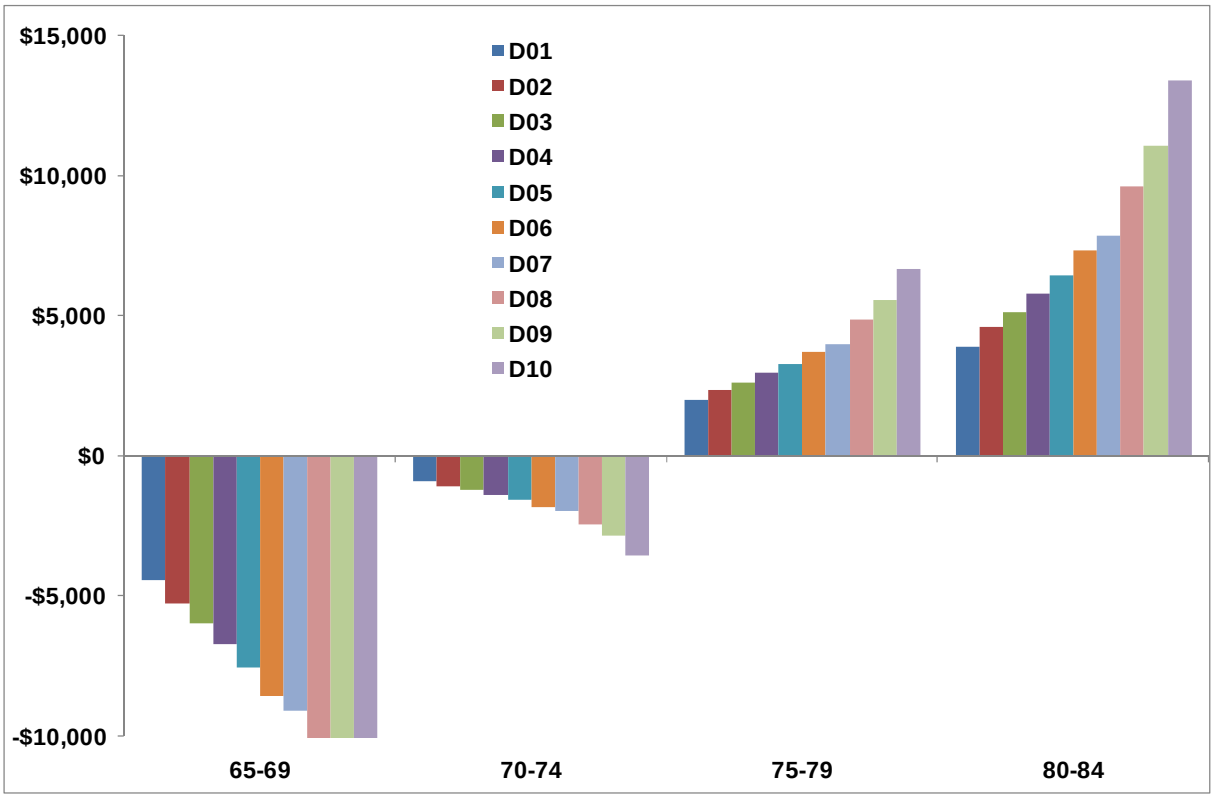


Chart 28 shows the effects of the deferred 30% annuity simulation on gross private income by age as at 2040-41. Relative to the immediate annuity case seen in Chart 13, this scenario produces a greater shift in private income from younger to older retirees.

As a result, younger retirees see larger falls in private income than in the immediate annuity case. The 70-74 year old age group sees a small reduction in average retirement income, with net increases for retirees aged 75 and over.

CHART 28: EFFECTS OF THE DEFERRED 30% ANNUITY SIMULATION ON GROSS PRIVATE INCOME BY AGE AS AT 2040-41



APPENDIX A: THE SUPERSIM MODEL

Access Economics' SuperSim model projects retirement savings outcomes in Australia over the coming century. It combines broad scope, detailed projections and unmatched flexibility to provide a level of modelling sophistication previously reserved for government agencies.

It also has a broad range of relevant policy levers, allowing for many of the potential options likely to be explored as part of this project.

That has the particular advantage of making it easy to adjust some of the key drivers of the outcomes, which is critical to the success of the project as policy options are developed and updated in the short timeframe available.

Access Economics' *SuperSim* model is a dynamic, long run model designed to project outcomes for retirement savings in Australia. It includes detailed projections of outcomes within the superannuation system, and a flexible framework for measuring the impact of changes to super policy.

KEY OUTPUTS

At its broadest level, the model is able to project outcomes for:

- **Working households**. Relevant stocks and flows among pre-retirement households, are presented in a framework similar to the ABS national accounts, including:
  - Household income
  - Household savings by broad asset class
  - Household consumption
- **Retirees.** Detailed projections of assets at retirement are coupled with an allocated pension framework to create a full suite of private asset and income projections for retirees.
- **Governments.** Taxes on income, housing and superannuation are projected within the model, and policy changes flow through to all other aspects of the results, including through the behavioural responses of individuals.
- **Asset markets.** As retirement savings are accumulated within the model, projections of total assets within each broad class are available.

At finer levels of detail the model provides insights into the savings experience of a range of groups, allowing analysis of retirement outcomes:

- **By age, and date of retirement.** Model results can be tailored to show impacts of specific generations of retirees, as well as retirement cohorts.
- **By current and lifetime income**. A dual income distribution allows the model to distinguish between the 'asset rich' and the 'income rich' at any point in time.

KEY INPUTS AND ASSUMPTIONS

Underlying the richness of the model results is a robust and flexible methodology. In keeping with the policy modelling focus of the *SuperSim* model, scenario analysis can be conducted on a wide range of assumptions, including key model equations.

A complete list of possible changes would be long – the input-related sections of the model alone contain over 1,800 variables.

Some of these parameters are more important than others, and make up a standard set of 'levers' which provide for a range of possible future scenarios. This section outlines the major inputs and assumptions which might be varied in a straightforward simulation of the model.

ECONOMIC ASSUMPTIONS

Economic projections in the model are constructed from historical data and assumptions about future trends in key variables. At their simplest, these assumptions resemble those in the Commonwealth's *Intergenerational Reports* (IGRs), though a more detailed view of economic trends can be informed by Access Economics macroeconomic model (the AEM).

Assumptions are made about the following variables, in each year of the projection period:

- **Population projections, by age cohort.** Current values reflect the most recent population projections from the ABS.
- **Inflation**. Current values reflect IGR assumptions.
- **Productivity growth**. Current values reflect IGR assumptions.
- **Participation rates by age cohort**. Current values reflect IGR assumptions.

Changing the values of any of these assumptions, year by year, is a simple matter within the model. In this way, the model can create new economic projections to suit any scenario. That is a key advantage given the current economic circumstances surrounding the review.

SUPER SYSTEM PARAMETERS

Much of the SuperSim modelling uses known system parameters, such as the 9% SG rate, to project future outcomes. While many of these values are fixed over time, they present opportunities for scenario analysis to reflect changes in government policy, and alternative views of future consumer behaviour in the retirement savings system.

A selection of key parameters might include:

- **The SG Rate**. While there is little prospect of a change to the 9% SG rate in the near future, this parameter allows the model to consider the impact of a broad lift in super contributions.
- **Preservation arrangements**. Preservation rules currently provide an important threshold for super benefits, but given demographic trends, there may pressure to further increase the preservation age in coming years. A set of parameters identifying eligibility for super benefits is available by age, allowing staggered changes to preservation ages over time.
- **Voluntary contribution rates**. Voluntary contributions are modelled in detail within the model, but assumptions about the level and source of these contributions can be

varied for each scenario. Separate parameters are available by contribution type, allowing changes to effect salary sacrifice contributions and after tax contributions separately. Current values assume that recent contributions behaviour is unchanged over the projection period. For each year in the projection period changes can be made both by age cohort, and current year income decile.

- **Earnings rates by broad asset class**. Earnings in the SuperSim model are currently set to growth in nominal GDP, plus an optional 'equity risk premium', and are equal for super, housing and other assets. Each of these assumptions can be varied in each year to create a wide range of potential scenarios for future investment performance.
- **Income stream purchases.** Shares of the benefits from the super system which are withdrawn as an income stream product are currently informed by a combination of industry statistics and ATO TaxStats. This assumption can be varied by type of super (employer or after tax contributions), by year. The model's parameters are set to assume that two-thirds of member benefits at retirement are taken as a lump sum, which is then drawn down at double the rate of superannuation allocated pensions.

Again, all the above parameters can be changed to suit any new scenario within the model.

TAXES AND SUBSIDIES

The SuperSim model has been designed to measure the impacts on retirement incomes of changes to the complex system of taxation surrounding superannuation in Australia. It is therefore well placed to simulate a range of scenarios for future taxes and co-contribution arrangements.

Key input variables include:

- **Income tax rates and thresholds**. Incentives to contribute to super are closely tied to the income tax system, and the deductibility of some contributions mean that changes to the super system can have 'second round' impacts on income tax revenues received by the government. All current rates and thresholds, including the Medicare levy and the low income tax offset, can be altered within the model for any year in the projection period.
- **Super contributions tax rates**. The 15% tax on contributions to super is perhaps the most visible of the current super taxes. The model allows this rate to be altered in any year
- **Earnings taxes**. Within the SuperSim model, final 'effective' rates of earnings tax reflect two factors – the rate of tax, and the value of imputation credits available to funds for the purpose of offsetting their earnings tax liability. Both of these can be varied as part of any scenario.
- **The government co-contributions scheme**. The *SuperSim* model includes options for this scheme that include all current policy parameters, plus options to extend and alter targeting of the scheme. Inputs for each year of the projections include:
  - Income thresholds (including adding new thresholds).
  - Matching rates (including the addition of variable rates and phase-outs).
  - Maximum contributions (including phase-out rates).

APPENDIX B: LIFETIME VERSUS CURRENT INCOMES

Appendix Table 1 compares estimates of average income within each current and lifetime decile.

APPENDIX TABLE 1: AVERAGE ANNUAL INCOME BY DECILE – 2005-06

	Current year income deciles		Lifetime income deciles	
	Average Wage & Salary Income	Average Total Income	Average Wage & Salary Income	Average Total Income
Decile 1	$0	$0	$8,233	$18,211
Decile 2	$129	$7,084	$11,652	$26,785
Decile 3	$3,052	$19,445	$15,073	$32,947
Decile 4	$11,133	$25,904	$18,506	$38,605
Decile 5	$16,697	$36,375	$21,914	$44,163
Decile 6	$23,306	$44,687	$25,783	$50,508
Decile 7	$28,896	$55,711	$27,192	$52,695
Decile 8	$37,033	$67,766	$34,800	$65,355
Decile 9	$47,088	$85,847	$40,317	$74,674
Decile 10	$85,308	$151,021	$49,172	$89,898
Average	$25,264	$49,384	$25,264	$49,384

Source: Household Income and Labour Dynamics in Australia (HILDA) Survey data, Access Economics

It is important to note that **these figures represent the same measures of income averaged across two different groups of individuals**, rather than averages of measures for the same ten groups. In simple terms, these lifetime income deciles below are constructed by recognising that:

- For each individual in the population, we observe past and present incomes (including that for the 2005-06 financial year), and are able to quickly form current year income deciles by ordering and grouping individuals.
- At some point in the future, each individual for whom we have measured 2005-06 income will also be included in a lifetime income decile, based on the total income they have earned in the past. By definition, the lifetime decile attached to each individual:
  - cannot change over time (since every individual lives once),
  - cannot be observed with certainty until the end of his/her life, and;
  - has ten possible outcomes, with the probabilities attached to those outcomes dependent on the future income of the individual, and of all other individuals in the population.
- For each possible combination of future 'current year' income deciles, the lifetime income for an individual can be estimated by adding up the average income in each decile that individual falls into in every future year. That is, if we just knew what future 'current year' decile 'path' each individual would follow, we could estimate their lifetime income decile.
- To estimate the future 'path' of income for individuals in each current year income decile, a Monte Carlo simulation approach is used:

- An estimate of the probability attaching to a 'guess' at an individual's future income decile can be made, based on the number of similar individuals who achieved that outcome in the past.
- We know that these hypothetical income 'paths' are not likely to be accurate predictions for the individual, but if enough 'guesses' can be made they don't need to actually *be* 'right' as long as it is known *how likely* they are to be 'right'.
- The probabilities attaching to each 'path' can be applied to estimate the share of each current year income decile which is *expected* to fall into each lifetime income decile.
- These shares can then be applied to the (known) current year income deciles to obtain the lifetime income decile averages outlined above.