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GENERATIONAL ACCOUNTING—AN AUSTRALIAN PERSPECTIVE

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This paper presents a set of generational accounts for Australia, following the approach developed in the U.S. by Auerbach, Gokhale and Kotlikoff. In contrast to the Auerbach *et al.*, results for the U.S., the generational accounts presented here do not imply that a disproportionately high fiscal burden will have to be borne by future generations in Australia. In the paper, generational accounts are used to estimate intergenerational redistribution related to policy changes in the area of public retirement pensions.

I. INTRODUCTION

For some years now there have been growing concerns in developed countries regarding the future viability of social security systems in general, and unfunded pay-as-you-go pension schemes and subsidized health care in particular. Slower rates of economic growth and a tendency towards an aging of the population quite naturally lead to concerns that the implied future net taxation burden on younger (working) generations will be excessive, assuming a continuation of the general thrust of current policy.

The move towards funded retirement benefits in Australia clearly has as one of its major aims the moderation of future government retirement benefit liabilities. As such it embodies the view that simply shifting the burden of supporting future retired baby boomers onto younger generations is neither politically nor economically feasible. This paper presents calculations which show that, for Australia at least, concern about the impact of aging of the population may be overstated. Further, they suggest that policy changes designed to limit future government retirement benefit liabilities could have significant intergenerational effects.

Behind concerns about maintaining real levels of public sector consumption expenditures is the more fundamental question of how fiscal policy affects the distribution of well-being among generations. In principle, if current fiscal policy does not imply placing increasing burdens on some generations to the benefit of others, then it should not provoke fears about its sustainability; on the other hand, fiscal policy settings which imply a markedly increased burden on certain generations—especially young and future generations—may constitute a real cause for concern.

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This paper presents a set of generational accounts for Australia designed to provide an empirical basis for forming responses to the issues raised above. In particular, the generational accounts are used here to investigate intergenerational redistribution related to changes in the provision of retirement income.

Generational accounts show, for a typical member of each generation distinguished by year of birth and gender, the present value of expected net lifetime payments to the public sector, given assumptions about future fiscal policies, growth and demographic change. They provide a practical means of judging the intergenerational distributional effects of particular fiscal policies, and the intergenerational implications of overall fiscal policy.

Recent research by Auerbach, Gokhale and Kotlikoff (1991, 1992a and 1994, hereafter referred to as Auerbach *et al.*) and Kotlikoff (1992) provides the starting point for this paper. I begin by outlining the generational accounting framework (Section 2). Section 3 summarises the procedures used to calculate the Australian generational accounts. Results obtained using several sets of base case assumptions are presented and discussed in Section 4; the generational accounts are used in Section 5 to analyse the generational effects of proposed changes in public retirement programs.

2. The Generational Accounting Framework

Generational accounting focuses on the government's present value budget constraint, and the effect on the intergenerational distribution of well-being of the zero sum nature of fiscal policies. As Auerbach *et al.*, (1994) point out, the requirement that government satisfy a present value budget constraint is explained by the fact that the public sector cannot continually shift the burden of paying for its purchases of goods and services onto future generations by increasing its borrowings; a default on the repayment of the public debt would necessarily occur once the interest payments on the debt exceeded the resources of future generations.

The government's present value budget constraint in any year t simply states that the sum of government's year t net wealth and the present value of projected net payments to the government by all current and future generations must equal the present value of current and future government final consumption expenditures. Following Auerbach *et al.*, one can write this budget constraint in year t as

$$(1) \qquad \sum_{s=0}^{D} N_{t,t-s} + \sum_{s=1}^{\infty} N_{t,t+s} + W_t^g = \sum_{s=t}^{\infty} G_s \prod_{j=1}^{s} \frac{1}{1+r_j}.$$

In this equation generations are distinguished by year of birth, although they may also be distinguished by sex. $N_{t,k}$ represents the present value of year t of the remaining lifetime net payments to the government by the generation born in year k. The maximum lifetime of a member of a particular generation is denoted by D.[1] Thus the first term on the left hand side of equation (1) represents the net

[1]By assuming that the maximum lifetime is D we are assuming that all people live D years, only that there are no members of the generation born in year k alive after year $k+D$.

present value contribution to government of generations alive (or born) in year t; the second term on the left hand side represents the net contributions of all future (yet unborn) generations. W_t^g is a measure of the net wealth of the government in year t. On the right hand side of (1), G_s denotes undiscounted government final consumption expenditure in year s. The G_s's are discounted using pretax rates of return.[2] The pretax rate of return in year j is denoted r_j. Π is the product sign.

In the Auerbach *et al.*, terminology, a set of $N_{t,k}$'s, divided by the corresponding numbers of members of each generation, represents a set of generational accounts. For generations currently living, the $N_{t,k}$'s will show remaining net contributions.

For generations alive in the base year t, the total account of a generation born in year k is defined more precisely as

$$N_{t,k} + \sum_{s=t}^{k+D} T_{s,k} P_{s,k} \prod_{j=t+1}^{s} \frac{1}{1+r_j}. \tag{2}$$

In equation (2), $T_{s,k}$ denotes the average *net* amount that a member of the generation born in year k is projected to pay to the government in year s, while $P_{s,k}$ is the number of members of this generation surviving to year s. D and r_j retain their previous definitions.

Ideally the $T_{s,k}$'s could take account of all payments to, and all benefits received from, all levels of government. In practice, however, as the inclusion of the G_s terms in (1) implies, the value of government consumption expenditure can not be fully imputed to individuals.[3]

This approach to generational accounting obtains the generational accounts for future generations as a residual by subtracting government net wealth and the sum of the generational accounts of currently living generations from the present value of government final consumption [cf. equation (1)]. In addition to population projections and assumptions regarding the rate used for discounting and the growth of government final consumption, we need to make assumptions about the future evolution of the age-specific profiles of both payments to and benefits from government. An assumption regarding the way in which the implied fiscal burden is distributed over future generations (those born after year t) is also required. As in Auerbach *et al.*, here it is assumed that typical members of successive future generations pay the same net amount adjusted for a real per capita growth factor.[4]

[2]The use of pretax rates of return in generational accounting is explained by the Auerbach *et al.*, (1991, p. 68) view of the generation's present value budget constraint. According to this view, the present value of a generation's resources equals the present value of what these resources would be in the absence of government, minus the present value of net tax payments, discounted at pretax rates of return.

[3]In this regard the present study differs from previous generational accounting exercises because it attempts to allocate the value of government consumption expenditure on both educational and health to generations.

[4]For example, if the assumed growth rate is 0.75 percent per annum, the present value (at birth) of net payments made by a typical member of the generation born in year $t+2$ will be 1.0075 times the present value at birth of net payments made by a typical member of the generation born in year $t+1$.

Estimated generational accounts also depend on the assumed system of labelling payments/benefits and on incidence assumptions. An example of the former is the labelling of social security contributions as taxes rather than private saving. Importantly, changes to generational accounts resulting from different fiscal policy scenarios are invariant to the labelling conventions used, as demonstrated in Auerbach *et al.*, (1991). However, the same cannot be said of incidence assumptions. For instance, the changes in generational accounts implied by changes in public family allowance policies will depend on whether these cash benefits are attributed to the nominal recipient (parent or guardian) or to the children to which they refer.

Although the calculation of generational accounts can incorporate various assumptions regarding changes in economic behaviour over time, a standard assumption is that the economic behaviour of each age/sex category will be the same in the future as it is in the base year. For instance, labor participation rates by age and sex are assumed to remain constant over time. Generational accounting also typically ignores relative price effects stemming from fiscal policy or demographic change.[5] Consequently generational accounts can at best approximate the potential direct intergenerational redistribution implied by a given change in fiscal policy.[6]

3. Calculation of Australian Generational Accounts

Here, I follow the procedures for calculating generational accounts as outlined in the Auerbach *et al.*, (1991) study, in order to allow comparison of the results obtained for Australia with those for the U.S. However, differences in the availability of data and in the structure of economic relations between individuals and the public sector have necessitated some differences of approach. A detailed description of the procedures used to establish the Australian accounts are given in Ablett (1994). A summary of the procedure used is presented here.

The calculation of generational accounts for generations alive in 1990–91 (year t) is based on a set of age and gender profiles of estimated average payments to, and average benefits from, government in 1990–91, classified into the categories given in Table 1.

[5]However, in their published generational accounting research Auerbach *et al.*, express the view that relative price effects associated with policy change generally occur slowly, even though they may be quite significant. This view is supported by simulations presented in Auerbach and Kotlikoff (1987). If the indirect dynamic effects occur slowly, then their effects on the generational accounting present value calculations should be minor. Fehr and Kotlikoff (1995) provide a recent analysis of generational accounting in the context of a general equilibrium simulation model.

[6]Another issue in generational accounting is the validity of using calculations of changes in generational accounts to predict the effects of changing fiscal policy on consumption/saving, as in Auerbach *et al.*, (1992b). As emphasized by Bohn (1992), the time profile of tax payments by each generation is also important in analysing the real effects of government financial policy in contexts where some members of generations are liquidity constrained during certain periods of their lives. Drazen (1992) also makes the point that expectations of *how* a particular fiscal burden is to be extracted from a generation should be important in determining the generation's economic behaviour. Recent discussions of the limitations of generational accounting are given by Haveman (1994) and Buiter (1995).

TABLE 1

CLASSIFICATION OF PAYMENTS AND BENEFITS

Payments to Government	Benefits from Government
1. Labour Income Taxes	1. Old Age Benefits
2. Medicare Levy	2. Family and Child Benefits
3. Capital Income Taxes	3. Unemployment Benefits
4. Property Taxes	4. Other Social Security
5. Indirect Taxes	5. Hospital Benefits
	6. Non-Hospital Health Benefits
	7. School Education Benefits
	8. Higher Education Benefits
	9. Tertiary and Further Education Benefits

In carrying out this study the first task is to estimate the 1990–91 age profiles of the payments and benefits shown in Table 1. This is achieved by scaling relative age profiles of payments and benefits obtained from survey and other data to be consistent with the appropriate 1990–91 national aggregates.[7]

Once the age profiles of all payments and benefits are obtained, they are projected into the future using a real (per capita) growth rate scenario; several scenarios were used. This allowed calculation of the $T_{s,k}$ of equation (2), i.e. the average net amount that males and females born in year k are projected to pay to the public sector in year s. The complete set of $T_{s,k}$ values for generations alive in 1990–91, combined with population projections, then yielded a set of $N_{t,k}$ values, the present values of total generational fiscal burdens.[8]

The most important departure from the Auerbach *et al.*, approach concerns the treatment of general government final consumption expenditures.[9] Auerbach *et al.*, include education expenditure as part of general government consumption expenditures and do not allocate them to gender and age groups. Insofar as the benefits of education expenditures are not distributed equally over all age/gender categories, one would expect this procedure to introduce a bias into their results.

[7]Sources of survey data included the Australian Bureau of Statistics' 1990 *Household Income Survey*, 1988 *Household Expenditure Survey* and 1990 *National Health Survey*. Hospital benefits for 1990–91 were distributed by age and sex using relative age and gender profiles of hospital usage, while non-hospital health care benefits were allocated according to a relative profile of frequency of consultations with a doctor. More details of the profile data and benchmarking aggregates for each payment and benefit category are given in Ablett (1994) and can be obtained from the author on request.

[8]The demographic data used was that of the Australian Bureau of Statistics' *Series A* population projections to 2041 extended to 2100. These suppose improvements in mortality rates up to 2041, steady increases in net migration up to 2001, and constant net migration of 70,000 per year after 2001. The long term net migration assumption is considered conservative, although current net migration levels are historically low. More details regarding the population projections are available from the author.

[9]Another methodological difference between the Australian and United States generational accounts is that the Australian accounts do not include an adjustment to capital income taxes to account for any capitalised value of taxes on existing assets. The main reason for this is that for the base year considered significant tax incentives for new capital investment in Australia were absent. The capital income tax adjustment applied in the United States generational account is explained in Auerbach *et al.*, (1991, pp. 67–69 and Appendix) and discussed in Haveman (1994).

This would be the case with any component of expenditure included in the government final consumption aggregate which is targeted more to certain age groups than to others.[10]

Calculation of the total fiscal burden to be borne by future generations requires, inter alia, projections of government consumption expenditure. If the elements of this expenditure target particular age groups then it is necessary to take account of changes in age composition of the population (not just population size) when calculating these projections. This is the approach taken in the generational accounts of the U.S.[11]

Although changes in the age composition of the population are not incorporated into the government consumption projections used here, an effort has been made to allocate public final consumption expenditures on education and health by age and gender, i.e. to include the value of these expenditures in the generational accounts. For education, separate per student averages of government final consumption expenditure in 1990–91 on school, university, and other tertiary education were first calculated; multiplication of these average expenditures by the numbers of students in each form of education by age and gender gave the required allocations.

Of course expenditure on education could be considered an investment which yields benefits to individuals (and society) over the rest of their lives. Equating the value of education benefits with the costs of education is also questionable. The method used here to allocate in-kind public education benefits to generations clearly represents a particular incidence assumption which affects the generational accounting results. However, it is felt that this incidence assumption is a reasonable first approximation.

For the purposes of this study, unallocated government final consumption for 1990–91 was taken to be total government final consumption expenditure less final consumption expenditure on education and health, as reported in the National Accounts. This allowed the calculation of per capita unallocated government final consumption for 1990–91. Then using an assumed per capita growth rate (0, 0.75 or 1.5 percent), an assumed interest rate and population projections, the present value of current and future unallocated government consumption was calculated. Since population projections were only available for years up to 2100, *total* unallocated government consumption was assumed to grow at the assumed per capita growth rate after that year.

The calculation of the total burden to be placed on future generations [cf. equation (1)] also requires a measure of government net wealth in year t. No attempt will be made here to address the difficult conceptual and valuation issues surrounding the measurement of government net wealth. However, it is worth stressing that it is important, particularly in the context of generational accounting, to have some measure of the extent to which government will need to extract

[10]However, this need not constitute a problem in terms of analysing changes in generational accounts brought about by changes in the fiscal policy scenario. Provided the fiscal policies considered can be assumed not be affect the distribution of benefits of government final consumption by age and gender, this distribution is irrelevant for the analysis.

[11]Details of the method employed are given in, for example, U.S. Office of Management and Budget (1994, p. 30).

resources from generations in the future to pay for debts incurred in the past. It is clear from an examination of equation (1) that any conclusion regarding the relative fiscal burden to be placed on future generations compared to currently living generations will depend on the measure of government net wealth employed. Thus although Kotlikoff and his co-authors claim (e.g. Kotlikoff, 1984 and 1988, Auerbach *et al.*, 1991) that it is impossible to measure government debt in an economically meaningful or well-defined way, they still require a measure of government net wealth to make generational accounting comparisons of this nature.

To keep the treatment of government net wealth in this paper comparable to that employed by Auerbach *et al.*, (1991), public sector net wealth in Australia in 1990–91 is calculated simply by dividing general government's net interest payments by the sum of the assumed interest rate and an assumed inflation rate (taken to be 5 percent per annum).[12] The public sector's net return to capital is represented here by the sum of interest and dividends received and income transferred from public trading enterprises, minus interest paid. When the real interest rate is assumed to be 6 percent per annum, the value of Australian government net wealth in 1990–91 is estimated to be −$28.1 billion.

The above-mentioned measure of government net wealth is obviously questionable. It is essentially a measure of net financial capital which ignores the values of physical assets owned by government. Therefore some sensitivity analysis is performed in the presentation of the base case results of the next section. This analysis attempts to bracket what would be the ideal measure of government net wealth for generational accounting purposes, with a lower bound represented by official government debt and an upper bound including the National Accounts' estimate of government capital.

The appropriate discount rate to be used in generational accounting is obviously hard to determine. Auerbach *et al.*, (1991, p. 74) argue that if future government receipts and payments were riskless, then the government's borrowing rate would be the appropriate discount rate. However, if there is risk associated with future receipts and payments, and some individuals are risk averse, then they suggest the discount rate should account for this risk; their 6 percent rate reflects this view.[13]

As in the U.S. generational accounts, the preferred discount rate used in the Australian accounts is a uniform 6 percent. Historically this is generally higher than real rates of return on Australian government debt and below rates of return on private capital.

4. Base Case Results Assuming Unchanged Fiscal Policies

Generational accounts for Australia were calculated using three different per capita growth rate assumptions (0, 0.75 and 1.5 percent) and both high (5, 6 and

[12]The most recently published generational accounts for the U.S. in fact use a different measure of government net wealth, given by the sum of federal, state and local government deficits over the period 1900 to 1992 (U.S. Office of Management and Budget, 1994).

[13]Auerbach *et al.*, (1991, 1994) also acknowledge that different discount rates for receipts and payments would be justified on the grounds of different risk characteristics. This point is discussed at length by Haveman (1994).

TABLE 2

BASE CASE GENERATIONAL ACCOUNTS WITH $r=0.006$ AND $g=0.0075$
PRESENT VALUE OF NET PAYMENTS (Thousands of $)

Generation's Age in 1990–91	Net Payments Males	Females
0	38.2	3.3
5	53.8	9.1
10	88.3	31.4
15	131.8	59.3
20	167.9	85.3
25	182.9	87.9
30	179.6	83.4
35	170.2	82.0
40	152.1	73.0
45	123.6	51.8
50	88.1	24.8
55	45.5	−3.2
60	9.4	−22.0
65	−15.0	−32.2
70	−19.8	−35.4
75	−14.7	−33.0
80	−14.2	−27.2
85	−10.5	−23.7
90	−11.5	−16.8
Average for M & F Born 1990–91	21.2	
Average for M & F Born 1991–92 (Future Generations)	−62.7	

7 percent) and low (2.5, 3 and 3.5 percent) interest rate ranges, following Auerbach *et al.* The low interest rates roughly cover past real rates of return on government bonds.

Table 2 shows a summary of the preferred base-case generational accounts for males and females, using an annual interest rate of $r=0.06$ (6 percent) and annual uniform growth rate of $g=0.0075$ (0.75 percent), and supposing no fiscal policy changes after 1990–91.[14]

It can be seen from Table 2 that for those alive in 1990–91, the accounts are for the most part positive for generations that had not yet reached retirement age in that year. The accounts for females generally turn negative before those of males, mainly reflecting the earlier average retirement age of females. The present values of remaining lifetime net payments to government by elderly generations are negative given that they will generally receive more in retirement and other benefits than they contribute in taxes over the remainder of their lives. Elderly women are projected to fare significantly better than similarly aged men in terms of net benefits mainly because they have a significantly higher life expectancy and hence higher retirement pension receipts.

For base cases assuming a high interest rate, the Australian generational accounts imply a net negative burden on future generations. However, given the

[14]On average in 1991 one U.S. dollar was worth 1.27 Australian dollars (International Monetary Fund, 1993).

dependence of the levels of generational accounts on labelling assumptions, we should not read to much into these observations. Of more importance is the comparison of age 0 and future generation accounts.

As previously stated, typical members of each successive future generation pay the same net present value amount adjusted for the assumed growth rate. This permitted calculation of the average generational account (males and females combined) for those born in 1991–92 or after, as in the last row of Table 2. It was felt that, for the purposes of the comparison being made, it was not necessary to make any particular assumption regarding the distribution of the fiscal burdens of future generations between the males and females. An average account was also calculated for those born (aged 0) in 1990–91. Thus the figure of \$21.1 thousand in the second last row of Table 2 is a weighted average of the male and female accounts in the first row of figures of the table. The results of these calculations for the various assumed interest and uniform growth rates are given in Table 3.

TABLE 3

GENERATIONAL ACCOUNTS OF AGE 0 AND FUTURE GENERATIONS (Thousands of \$)—WEIGHTED AVERAGES OF MALE AND FEMALE ACCOUNTS

	g=0		g=0.0075		g=0.015	
Interest Rate	Age 0 in 1990–91	Age 0 in 1991–92	Age 0 in 1990–91	Age 0 in 1991–92	Age 0 in 1990–91	Age 0 in 1991–92
0.025	92.4	34.2	130.6	87.8	181.0	200.5
0.03	72.9	10.7	104.5	49.7	146.4	115.9
0.035	56.9	−7.7	83.0	22.4	117.7	68.3
0.05	24.4	−44.2	38.9	−38.7	58.5	−12.6
0.06	11.4	−58.9	21.2	−62.7	34.5	−57.4
0.07	2.8	−68.8	9.4	−77.3	18.3	−82.0

Comparing the average accounts for newborns and future generations, it can be seen that future generations are projected to fare substantially better than 1990–91 newborns in all base-case scenarios except in the case with the highest growth rate and low interest rate ($g=0.015$ and $r=0.025$) assumption. For example, in the $g=0.0075$, $r=0.06$ scenario, which is the preferred case, males and females born in 1990–91 would have average generational accounts of \$21.2 thousand, i.e. a net payment, while those born in 1991–92 could expect to receive a net benefit in present value terms of \$62.7 thousand.[15]

To assess the effect of the measure of government net wealth used, the implied burden on future generations was also calculated for the $r=0.06$, $g=0.0075$ base case using two alternative measures. First, to set a lower bound, net wealth was

[15]The preferred 0.75 percent growth rate assumption is conservative given recent Australian history. Real per capita GDP, government revenue and government expenditure in Australia grew at average annual rates of between 1 and 1.5 percent during the 1980s (International Monetary Fund, 1993). However recent economic growth in Australia has been largely achieved through externally financed investment. Australia's external debt to GDP ratio increased from 11 to 43 percent in the decade to end 1992 (Australian Bureau of Statistics, 1993b). A marked increase in national saving will be required if Australia's recent growth performance is to be sustained over the long term. As yet there is little evidence of this occurring. In this context the moderate growth rate assumption is considered preferable.

taken to be simply the negative of government net debt at 30 June, 1991 (−$108.8 billion). Secondly, an upper bound was calculated as the difference between the value of government capital, (from the National Accounts) and government net debt as at 30 June, 1991, giving a government net wealth estimate of $231.9 billion. The lower and upper bound estimates of government net wealth yielded implied fiscal burdens on 1991–92 newborns of −$42.2 thousand and −$129.3 thousand, respectively, hence bracketing the −$62.7 thousand resulting from a government net wealth estimate of −$28.1 billion in the preferred base case. They show the government net wealth measure used can have a substantial effect on the implied fiscal burden on future generations. On the other hand, it is clear that a wide range of net wealth estimates could be applied without changing the qualitative conclusion that, under reasonable growth the interest rate assumptions, future generations in Australia are generally projected to fare better than today's newborns and young people.

Auerbach *et al.*, (1991), using the same method for distributing the implied burden on future generations as used in this paper, found the burden on future generations in the U.S. to be significantly greater than for the generation born in the base year. The more recent U.S. generational accounts (U.S. Office of Management and Budget, 1994) imply future generations would have positive generational burdens which are 126 percent higher than those born in the 1992 base year. By contrast, the Australian results imply generational accounts for future generations are negative and significantly lower than those of base year newborns.

How can one explain the different qualitative results? Although a detailed comparative analysis will not be attempted here, several points can be made.

Firstly, a major methodological difference between the Australian and U.S. generational accounts is the allocation to generations of all education expenditure in the Australian accounts. To gauge the effect of this, generational accounts for Australia were calculated with the previous base case assumptions, but with education expenditure included in the unallocated government consumption expenditure.[16] These show, for example, average generational accounts for 1990–91 (base year) and 1991–92 newborns that are, respectively, $50.3 thousand and −$24.5 thousand, which are substantially different from the corresponding accounts in Table 2. It is intuitively clear that the accounts for all generations will be lower if the value of education expenditure is imputed to them. This is particularly so for young and future generations who are still to benefit from many years of public education. Nevertheless, the qualitative conclusion of generational imbalance in favour of future generations remains intact.

If one compares the ratios of various elements of public finance to GDP for the U.S. and Australia, the most significant difference between the two countries concerns the ratio of public debt to GDP; in 1991 the U.S. ratio was 0.615 compared to 0.287 for Australia (International Monetary Fund, 1993). This is probably the main explanation of the different generational accounting results, since public debt enters the government net wealth estimate no matter how it is calculated.

[16]Changes in demographic structure were taken into account in calculating the projections up to 2100. Total education expenditure was assumed to grow at the rate of 0.75 percent per annum after 2100.

The ratio of public health expenditure to GDP was similar in the U.S. and Australia in 1991, however in the recent U.S. generational accounts this expenditure is assumed to grow at a faster rate than other components of the accounts. This must also contribute to the implied burden on future generations in the U.S. Simulations in Ablett (1994) assuming a rate of growth in public health expenditures almost twice that of the general growth rate also demonstrates this effect, but it is does not reverse the generational imbalance.[17]

5. Retirement Income Policy and Generational Accounts

Starting with the set of base case accounts presented above (or any other base set of accounts), one can change either the fiscal policy scenario or growth rate assumptions, and then gauge how the accounts change. In this section, changes in the provision of public retirement income are considered, with the base-case accounts taken to be those assuming a general growth rate of 0.75 percent and an interest rate of 6 percent.

At present the majority of retired Australians rely on public retirement pensions for most of their income. These pensions, funded out of consolidated revenue, represented 5.1 percent of GDP and 9.9 percent of government expenditures in 1990–91 (Australian Bureau of Statistics, 1993c).

The biggest change in Australian retirement incomes policy in recent years concerns the introduction of compulsory saving for retirement, as represented by the Superannuation Guarantee Charge (SGC). One of the aims of the SGC is to moderate the future growth of public retirement pension outlays. Under the SGC provisions, each employee has an individual retirement savings account, to which the employer makes contributions on behalf of the employee; these contributions are to be increased (in stages) to at least 9 percent of gross earnings by 2002.[18] The current government also projects additional contributions to the savings accounts by employees themselves amounting to at least 3 percent of earnings. Individuals will not be able to access the funds in their accounts before retirement. The future retirement incomes of those who have accumulated retirement account savings throughout their working lives will be mainly composed of income derived from these savings, perhaps supplemented by a reduced public pension.

FitzGerald (1993) presents projections suggesting the SGC provisions will lead to a reduction of retirement pension outlays of about one half of one percent of GDP by the middle of the next century. However, over the next 20 years these outlays are projected to be little affected by the SGC. There are three main reasons for this. First, prior to the introduction of the SGC, many Australians were not covered by any required scheme. The SGC contributions of many of these individuals over their remaining years of employment will be insufficient to

[17]In terms of demographic structure, the Australian population was marginally younger in 1991 than the U.S. population, with 37.9 percent of the population aged 0–24 years compared to 36.2 percent for the U.S., and a smaller proportion in the over 65 age range (Australian Bureau of Statistics, 1993a; U.S. Bureau of the Census, 1994). However, whilst Australia's relatively younger population at this point in time probably contributes to the favourable outcome for future generations in Australia, it cannot be considered the major factor in this outcome.

[18]There are also plans to extend compulsory saving for retirement to the self-employed.

diminish significantly their reliance on a publicly provided retirement pension. Second, the full provisions of the SGC are to be phased in over a lengthy period, so that contributions to retirement savings accounts will remain at low levels over the medium term. Third, low levels of income generated from savings do not reduce an individual's public pension entitlement.

The Retirement Income Modelling Task Force set up by the Australian government has produced projections (FitzGerald, 1993, p. 57) showing the effects of the SGC on the retirement incomes of single males with average weekly earnings and compulsory retirement saving (including the 3 percent employee contribution) commencing in 1992. The public retirement pension is projected to remain equivalent to approximately 25 percent of gross pre-retirement employment income for such males retiring in years up to 2016–17; for those retiring after 2016–17, this percentage is projected to diminish almost linearly until it stabilizes at 10 percent by about 2040–41.

These projections imply that the public retirement pension of a single male with average weekly earnings who retires in or before 2016–17 would be unaffected by the SGC. On the other hand, a similar male retiring in 2040–41 (or thereafter) would experience a 60 percent reduction in his annual public retirement pension compared to what it would be under a no SGC scenario. If it is indeed assumed that the projected reductions occur linearly over the 24 year period from 2017–18 to 2040–41, the implied reduction (compared to a no SGC scenario) in the annual public retirement pension for a similar male retiring in 2017–18 would be 2.5 percent (i.e. 60/24); for a 2018–19 retiree the reduction would be 5 percent, and so on.

In the absence of more detailed projections, the projected reductions in public retirement pension outlays per retiree are factored into the generational accounts by assuming that this time profile of reductions in public retirement pensions (compared to a non SGC scenario) for single males with average weekly earnings can be applied to all generations alive in 1990–91, supposing retirement ages of 60 and 65 for females and males, respectively. This assumed scenario for public retirement benefit reductions is presented as an illustrative example. Equally justifiable alternative scenarios could be readily formulated.

Table 4 shows the results of three simulation exercises involving retirement benefits policy. In each case the same percentage reduction in public retirement benefits associated with the SGC occur post-2016–17, but different retirement benefit growth rate scenarios are assumed for the period 1995-96 to 2015–16, namely 0.75, 0 and -1 percent.[19] In the first scenario, retirement benefits grow in real terms up to 2015–16 at the same rate as all other components of the generational accounts. In other words, the government is assumed to make no effort to reduce growth in real retirement benefits relative to other social security benefits. Compared to the base-case accounts with $g=0.075$ and $r=0.06$, this scenario results in 1991–92 newborns being about $14.0 thousand or 22 percent better off in net present value terms, while those generations aged under 40 years in 1990–91 are all worse off by present value amounts ranging from about $2.3 thousand

[19]As in Tables 2 and 3, the last two rows of Table 4 show average generational accounts for males and females combined.

to $10.0 thousand. These projected changes in generational accounts are not huge, particularly for generations alive in the base year. This is to be expected given that the SGC in its current form will have its main impact on government finances only in the long term.

TABLE 4

GENERATIONAL ACCOUNTS INCORPORATING SGC ASSOCIATED REDUCTION IN AGED BENEFITS POST-2016–17 WITH r=0.06 AND g=0.0075 EXCEPT FOR DIFFERENT AGED BENEFIT SCENARIOS PRESENT VALUE OF NET PAYMENTS (Thousands of $)

Age in 1990–91	Retirement Benefits Growth Rate 1995/96–2015/16					
	0.75%		0%		−1%	
	Male	Female	Male	Female	Male	Female
0	40.5	7.6	40.6	7.6	40.7	7.7
10	92.1	38.2	92.2	38.3	92.3	38.4
20	173.6	95.2	173.8	95.3	173.9	95.5
30	186.1	87.1	186.7	89.1	187.4	91.3
40	152.1	73.0	154.5	76.8	157.1	81.0
50	88.1	24.8	91.1	29.4	94.6	34.7
60	9.4	−22.0	11.9	−18.3	14.9	−14.0
70	−19.8	−35.4	−18.6	−33.4	−17.1	−31.0
80	−14.2	−27.3	−13.9	−26.6	−13.4	−25.8
90	−11.5	−16.8	−11.5	−16.7	−11.3	−16.5
Born 1990–91	24.5		24.5		24.6	
Born 1991–92	−76.7		−83.3		−91.0	

The other two envisaged scenarios suppose government combines the long run SGC policy with a policy of moderating growth in public age pension benefits over the period to 2015–16. This could be achieved, for example, by a policy of full or partial indexation of these benefits. A mechanism of full indexation of public pensions is in fact currently in place. As can be seen from Table 4, both of these scenarios again result in only moderate increases in the generational accounts of those alive in 1990–91, with those recently retired or close to retirement in the base year being most affected. On the other hand, future generations are markedly better off under these scenarios. With zero growth in real retirement benefits over 1995–96 to 2015–16, future generations would benefit from a $20.0 thousand or 33 percent reduction in their generation account compared to the base case; for the −1 percent per annum growth rate in retirement benefits scenario the reduction is $28.3 thousand or 45 percent.

The changes across the various scenarios displayed in Table 4 are readily explained. For those aged under about 40 years in 1990–91 these changes are minimal because they are far from retirement age. The differences in the public pensions they will receive in the future under the different scenarios amount to little in present value terms. For those recently retired or near retirement in 1990–91 the changes are more marked as they would be affected by lower pension growth rates in the short and medium terms. Finally, the changes for the older generations are minor because of their short remaining life expectancies.

The conclusion to be drawn from these exercises is that only moderate intergenerational effects are likely to occur as a result of the Australian SGC policy alone. However, if the SGC is combined with efforts to moderate the growth in retirement benefits in the short and medium terms, the benefits to future generations could be significant.

6. Conclusion

This paper has presented a set of generational accounts for Australia which suggest a small fiscal burden on future generations relative to young people alive today due to the structure of public taxation and expenditure policies in place in 1990–91. This is the reverse of the conclusion drawn from the U.S. generational accounts. The main reason for the difference between the U.S. and Australian generational accounts appears to be a significant difference in the importance of public debt.

Simulations involving a scenario of reduced future retirement pension benefits per retiree suggest that the current policy of compulsory saving for retirement is unlikely to yield a significant redistribution of wealth from existing generations towards future generations unless it is combined with policies designed to moderate retirement benefit payouts in the short and medium terms.

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