Generational Accounting and Intergenerational Balance

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THE redistributive aspects of public policy have always been of interest and concern to economists and social commentators in general. Although most popular concern focuses on redistribution between rich and poor households, for most people the major role of the modern welfare state is one of redistribution over the life cycle. Most see the need for some form of social insurance and redistribution to those in need; but they also believe that over their lifetimes the gap between what they contribute to the public sector and what they receive in benefits will not be too great.

It is true that much welfare policy ostensibly redistributes resources over individuals' life cycles. For example, people are taxed over their working lives and receive pensions and other benefits following retirement. But intergenerational redistribution of wealth by the public sector is also significant: many taxes and welfare programs affect various age groups differently; such policies frequently change; and demographic changes such as the baby boom after World War II are historically important.

The redistribution of resources between generations has attracted growing attention in recent times and is considered an important issue in the debate surrounding fiscal responsibility. As discussed by Scott (1995), one of the main purposes of New Zealand's Fiscal Responsibility Act 1994 is to avoid placing an excessive fiscal burden on future generations. In relation to the widespread belief in the need for fiscal tightening in Australia, John Pitchford has commented: 'If it is called for over the longer run, it would be to reduce the tax burden government policies are implying for future generations' (*The Australian*, 1 February 1995). The recent National Commission of Audit (1996:xvi) has also stated that 'a fair policy is to run budget surpluses to avoid imposing unfair burdens on future generations'. In addition, the Charter of Budget Honesty announced at the time of the 1996 budget includes a requirement for an 'intergenerational report' every five years (Costello, 1996).

A rough indicator of whether public policy is generating a relatively high future tax burden is the ratio of government outstanding debt to GDP. In Australia, this ratio has tended to decline since the 1950s. But it may be a misleading indicator of future fiscal burdens since it is affected by asset sales, which permit higher public expenditure without increasing public debt or taxation. In so far as asset sales are

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used to finance current consumption expenditures, a continuation of these expenditures would eventually have to be financed by increased taxation.

A more thorough way of analysing the issue is the generational accounting technique originally introduced in the US by Auerbach, Gokhale and Kotlikoff (1991). This technique and its application to Australia are discussed in this article.

Intergenerational Issues

Intergenerational redistribution through the public sector raises two issues. First, are welfare policies which favour some generations to the detriment of others sustainable, in particular those policies that imply a relatively high tax burden on future generations compared to those currently alive? Second, how does intergenerational redistribution affect intergenerational equity?

The current move to compulsory superannuation in Australia reflects the view that shifting the burden of supporting the future retired members of the currently young and baby-boomer generations on to future generations would not be politically or economically feasible. However, the extent to which compulsory superannuation will moderate future public age-pension payouts is still unclear, since doubts remain about the rate at which superannuation savings will accumulate, the rate at which other forms of saving may be run down, and the degree to which compulsory saving will limit future access to public age pensions.

The growth in the welfare state and the size of government over the 20th century has probably led in most developed countries to certain generations (notably the currently retired) receiving substantially more favourable treatment from government than other generations. Thomson (1991) claims that this is so for New Zealand; and retrospective calculations suggest it is so for the US (US Office of Management and Budget, 1994). Rising productivity and economic prosperity have clearly enabled successive generations to contribute progressively more resources to government. But a rising net fiscal burden on future generations could still be undesirable on the grounds that it would distort economic decisions of individuals and reduce efficiency.

Consideration of fiscal equity between currently living and future generations is complicated by ignorance. Rapid future productivity growth could justify shifting a greater fiscal burden on to younger and future generations; but we cannot be certain that such growth will occur. A prudent approach would be to assume that future generations will not have a significantly higher capacity to contribute to government, and therefore should not have higher tax burdens passed on to them.

Intergenerational equity is also at stake with government capital expenditure. If a large part of government debt passed on to future generations represents capital expenditure from which these generations will benefit, then it may be equitable for them to assume the responsibility of acquitting such debt. It may not be fiscally responsible to achieve a lower level of government debt by reducing investment in infrastructure and selling public assets. Unfortunately, it is usually politically easier to reduce government capital expenditure than other forms of public expenditure, even though this can be to the detriment of young and unborn generations.

What Are Generational Accounts?

Kotlikoff (1992) and Auerbach, Gokhale and Kotlikoff (1991, 1994) argue that conventional public deficit accounting is not a particularly appropriate framework for addressing issues of intergenerational redistribution. These authors show that by manipulating labelling conventions applied to its receipts and payments, the government can effect an intergenerational redistribution and report a balanced, surplus or deficit budget and any level of government debt, regardless of the direction or size of this redistribution. To overcome this problem, direct reference must be made to the government's present-value budget constraint. This constraint operates in such a way that in any given year the sum of the government's 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. Thus, if the present value of government consumption is to remain constant, policies which reduce the present value of net payments made by currently living generations would have to be offset by increased contributions by future generations. Reference to the government's present-value budget constraint expressed in generational terms makes such trade-offs immediately apparent.¹

According to Auerbach et al. (1991), generational accounts show, for a typical member of each generation distinguished by year of birth (and normally sex), the present value of expected net lifetime payments to the public sector, given assumptions about future fiscal policies, growth and demographic change. The assumed fiscal policy scenario could be the continuation of the policies in place in the base year of the calculations, or it could incorporate policy changes. Analysis commonly includes calculating changes in the accounts implied by different policy scenarios.

The value of generational accounting lies in the estimates it provides of what the generational accounts would be under reasonable scenarios for currently living generations, assuming future generations would accept the net fiscal burden (positive or negative) on them that this implies. In terms of the government's present-value budget constraint, the sum of the generational accounts of future generations is the residual obtained by subtracting government net wealth and the sum of the generational accounts of currently living generations from the present value of government final consumption. The generational accounting literature normally assumes that the aggregate net burden on future generations is so distributed that typical members of successive future generations face the same net fiscal burden, adjusted for some real per capita growth factor.

By itself, an aggregate positive net fiscal burden on future generations does not necessarily imply generational imbalance. What is important is how the per capita

¹ Strictly speaking, we should not consider government mediated redistribution, whether it be intergenerational or intragenerational, as a zero-sum game. Piggott and Whally (1987) demonstrate that it is incorrect to calculate the net fiscal incidence of redistribute government activity assuming the net benefits of such activity sum to zero. The intuitive reason for this is that redistribution will normally affect the economic behaviour of individuals and consequently the total amount of resources available to government (or the public sector 'cake').

burdens of future generations compare with those of currently living generations. Thus, in a generational accounting exercise, generational balance is gauged by comparing the generational accounts of future generations and a typical newborn in the base year of the calculations. The generational accounts of those alive in the base year of the calculations represent only remaining lifetime net fiscal burdens, except for those actually born in the base year. Thus, it is normally possible to compare meaningfully only the lifetime net fiscal burdens of a typical member of future generations and a typical base-year newborn. If the former is significantly higher than the latter, the assumed policy scenario is unsustainable, implying generational imbalance.

Empirical studies utilising generational accounting have until now abstracted from the behavioural impacts of policy and relative price effects in general. This is the basis of much of the criticism of generational accounting as currently practised (Haveman, 1994; Buiter, 1995). For example, it is usually assumed that workforce participation rates by age and sex remain the same in the future as they are in the base year; but, historically, such participation rates have not been stable. In addition, empirically estimated generational accounts depend on the particular incidence assumptions made.² But a positive feature of the methodology is that changes in generational accounts associated with simulated fiscal-policy scenario changes are invariant to the conventions used to label government receipts and payments.

Although it is true that different assumptions lead to wide variations in the absolute values of generational accounts, sensitivity analysis (a comparison of results using different discount and growth rates and demographic scenarios) in the context of these accounts has so far shown that the broad qualitative conclusions obtained are quite robust. Part of the reason for this is the nature of present-value calculations themselves. Except for very low assumed discount rates (under 3 per cent a year), the assumed short- and medium-term scenario up to 20-25 years post-base year largely determines the generational accounts; reasonably wide variations in the long-term scenario beyond this time frame generally have a relatively minor effect on the calculated accounts.

Advantages of Generational Accounting

The application of generational accounting is certainly not a straightforward procedure, given the formidable data requirements, the need for specific incidence assumptions, and measurement difficulties involving, for example, the estimation of government net wealth. Nevertheless, generational accounting provides a practical means of judging the intergenerational redistribution implied by particular fiscal

² Fehr and Kotlikoff (1995) have examined the ability of generational accounts to capture the intergenerational incidence of fiscal policy in the context of a dynamic general equilibrium simulation model. Their results tend to confirm a useful role for generational accounting. However, the feedback mechanisms present in their simulation model are yet to be incorporated in empirical applications of generational accounting.

policies. Its appeal also stems from the view that rational individuals are not myopic with respect to the future, as expressed in the following passage from Kotlikoff (1992:ix):

Generational accounting is forward-looking. It recognises that people think about tomorrow in deciding how much to work, spend, and save today. Part of their thinking ahead includes thinking about their future tax payments to and their future transfer payments from the government. In contrast to generational accounting, the deficit completely ignores the future, including the government's likely future taxes and transfer payments. In so doing, the deficit leaves out a great deal of what is influencing people's immediate spending decisions.

Generational accounting offers several other advantages. It measures all government revenues and outlays in present-value, constant-dollar terms; it explicitly accounts for government net wealth and future obligations; and it allows direct assessment of the appropriateness of current fiscal policies in the light of demographic projections.

In a country such as Australia, generational accounting could help focus the attention of fiscal policy-makers and the public on the potential intergenerational consequences of various actions, which may otherwise be overlooked. For example, an increase in social security entitlements that appears quite affordable at a particular point in time could nevertheless imply relatively large and perhaps inequitable future tax burdens due to future demographic change. Such knowledge could aid the development of a social security system which is both sustainable and equitable in an intergenerational sense.

Generational Accounts in Australia

To date, generational accounting has been used or is being introduced in the US, Italy, Norway, Australia, Japan, New Zealand, Thailand, Canada, Germany and Sweden (Fehr & Kotlikoff, 1995). In the US, generational accounts are now published annually as part of the official national government budget papers.

Generational accounts for Australia are presented in Ablett (1996a and 1996c), where the various assumptions and methods used are discussed. The summary accounts given in Table 1 are taken from Ablett (1996c) and are based on a scenario that assumes no fiscal policy changes after 1994/95.³ Based on financial year 1994/95, they assume a general real growth rate of 1 per cent a year in all per capita government receipts, payments and benefits for those alive in 1994/95, and a discount rate of 5 per cent a year. Sensitivity analysis using discount rates of 3 per cent and 7 per cent a year, and a range of growth rates, does not lead to different

³ Unlike the base year 1990/91 accounts presented in Ablett (1996a), the accounts in Table 1 are adjusted for the migration scenario assumed. This adjustment is explained in Ablett (1996c).

qualitative conclusions (Ablett, 1996c). A conservative future migration scenario is employed, which assumes net migration of 70,000 a year after 2000.

In these accounts, payments to government were divided into indirect taxes, and taxes on labour income, capital income, and property. Benefits from government included age pension, family and child, unemployment, other social security, school education, higher education, tertiary and further education, and hospital and non-hospital health benefits. Public education expenditures were imputed to generations on the basis of participation rates, while health care expenditures were imputed to generations on the basis of profiles of health care consumption by age and sex obtained from survey data. The government net wealth estimate used in the calculation of Table 1 was general government net debt as at 30 June, 1995.⁴

Table 1

Australian generational accounts (\$'000), base year 1994/95

Generation's age in 1994/95	Generational account	
	Males	Females
0	49.3	-6.4
10	106.8	22.8
20	196.4	81.3
30	206.4	82.8
40	168.0	73.3
50	90.0	17.6
60	1.9	-33.5
70	-27.4	-45.8
80	-18.0	-33.5
Average for males and females born in 1990/91	22.2	
Average for males and females born in 1991/92 ('future generations')	51.3	

Source: Ablett (1996c).

In Table 1, positive accounts represent projected positive net present value contributions to the public sector. For example, the first row of figures in the table indicates that, on average, a male born in 1994/95 is projected to contribute \$49,300 in net terms to government over his lifetime; the corresponding account for a fe-

⁴ This net wealth measure is in agreement with current generational accounting practice. It differs from the net wealth measure used by Auerbach et al. (1991) and in Ablett (1996a), which in the case of Australia would imply a more favourable outcome for future generations, but would not change the qualitative conclusion.

male born in 1994/95 is minus \$6,400 (a net receipt). For those alive in 1994/95, the accounts are for the most part positive for generations that had not yet reached retirement age in that year. The accounts of adult females turn negative before those of males, mainly reflecting the earlier average retirement age, lower earnings (hence lower tax contributions), and greater longevity of females. The present value of remaining net contributions by the elderly should be negative given that they will generally receive more in welfare benefits than they contribute in taxes over the remainder of their lives.

As stated previously, imbalance in generational accounts is gauged by comparing the (lifetime) accounts of base-year and future generations. In Table 1, these generations are represented by 1994/95 and 1995/96 newborns, respectively. The weighted average of the male and female accounts for these generations are shown in the last two rows of the table; the account for 1995/96 newborns is based on the assumption that typical members of each successive generation born after 1994/95 will face the same generational account at birth adjusted for the 1 per cent a year growth rate. The projections behind Table 1 imply a total positive burden on future generations, as reflected in the \$51,300 account for 1995/96 newborns. That this is more than the account of 1994/95 newborns suggests an imbalance in favour of current generations in terms of fiscal policy in the base year. This conclusion is robust against a range of alternative growth rate and discount rate assumptions.⁵

The 1994/95 results can be contrasted with the base year 1990/91 results presented in Ablett (1996a), which revealed generational imbalance in the opposite direction, i.e. in favour of future generations. Although the use of a different measure of government net wealth explains some of this difference, there was a clear deterioration in generational balance between the two base years.⁶ Much of this can be ascribed to major increases in public debt and government consumption expenditures after 1990/91.⁷

The public revenue and expenditure balance changed markedly in the years following 1990/91, the last year in which the Commonwealth government budget

⁵ Most generational accounts calculated for developed countries have shown an imbalance in favour of current generations. For example, assuming a general per capita growth rate of 0.75 per cent and a discount rate of 6 per cent a year, the base US generational accounts for base year 1992, incorporating the fiscal policy measures of the 1993 Omnibus Budget Reconciliation Act, imply a positive net fiscal burden on future generations which is approximately 126 per cent higher than on 1992 newborns (both males and females) (US Office of Management and Budget, 1994). This result reinforces the position of those calling for significant fiscal tightening in the US.

⁶ If the same government net wealth measure used in the establishment of Table 1 had been used for the 1990/91 accounts, a 1 per cent real growth rate and 5 per cent discount rate would have yielded average accounts of \$33,800 (1990/91 dollars) for 1990/91 newborns and minus \$12,300 for future generations.

⁷ Commonwealth government financial liabilities more than doubled between June 1991 and June 1995, while the level of Commonwealth government financial assets remained fairly stable. Over the same period the net financial liabilities of State and local government also increased, but more moderately (Australian Bureau of Statistics, 1995).

was close to underlying balance. By 1992/93, the underlying budget deficit was about 4 per cent of GDP. Part of this change was due to factors associated with the economic downturn, such as falling revenues and higher social-security outlays; but new spending initiatives also played a role. Since that time, policy measures such as the drop in the rate of company taxation from 39 to 33 per cent in 1993 (partly reversed in 1995), and implementation of the first (and only) round of *One Nation* tax cuts have clearly made the task of returning the Commonwealth budget to underlying balance more difficult.

There may be reason to believe that the degree of generational imbalance revealed in Table 1 is somewhat pessimistic. The Liberal-National Coalition government proposed public spending cuts of \$7.2 billion in its 1996 budget. Such expenditure restraint, for example in the area of social security benefits, could have a marked effect. For instance, if real per capita public age pensions were kept constant after 1994/95, rather than allowed to increase at the general growth rate, the accounts of 1994/95 and future newborns in Table 1 would change to \$26,000 and \$34,800, respectively. In the same context, extending the zero real growth rate assumption to all social security benefits would result in a slight imbalance in favour of future generations.

The National Fiscal Outlook (1996) projections, which take account of specific announced policy measures as at May 1996, foresee total government outlays falling from 34.9 per cent of GDP in 1994/95 to 32.6 per cent of GDP in 1998/99, with total government revenue falling marginally as a percentage of GDP in 1998/99. Application of these projections up to 1998/99 would result in a reversal of the generational imbalance in Table 1, with the accounts of 1994/95 and future newborns becoming \$29,900 and \$22,100, respectively.⁸

Implications for Government Policy

The imbalance favouring current generations evident in the baseline 1994/95 Australian generational accounts, although not catastrophic, does lend support to the current view that government fiscal policy should be tightened on intergenerational grounds. As such, the generational accounts represent further evidence that the general stance of fiscal policy in recent years would be unsustainable over an extended period.

Ablett (1996a) shows that the 1990/91 Australian generational accounts are changed little by incorporation of effects from the Superannuation Guarantee Charge, mainly because the full provisions of the current retirement incomes policy will be phased in over an extended period. However, if the move to compulsory saving for retirement has the result of limiting future public pension payouts, it will have a moderating effect on future tax burdens, in a similar manner to the zero age

⁸ In calculating these results the annual percentage changes in total outlays and revenue implied by the National Fiscal Outlook (1996) projections were applied uniformly to all generational account benchmarking aggregates for years up to 1998/99; the general per capita growth rate of 1 per cent per annum was applied to all years after 1998/99.

pension growth rate of the previous section.⁹ As noted above, the extent to which this will occur is still uncertain, and ultimately will depend on further changes to the law governing the relationship between superannuation and public age pensions. For example, more will have to be done to restrict the practice of taking superannuation entitlements in the form of a lump sum and then claiming the full age pension ('double dipping'). Currently young and baby-boom generations may conceivably resist moves to limit their access to a public age pension, arguing that it is unfair for them to be obliged to bear the major responsibility for their own retirement income provision through the superannuation system at the same time that part of their taxes are being used to fund the aged pensions of elderly generations. However, this tax burden should not be overstated, given that the present retired cohort is relatively small, only about one sixth of the size of the current working-age population.

Changing circumstances and policies could in the future affect the qualitative results from the Australian generational accounts. A further substantial increase in government debt could reinforce the generational imbalance result. The recent US experience demonstrates how quickly government debt can grow in the absence of effective control. Rapid and sustained increases in health care costs or various other major components of public expenditure may also affect generational balance. There is clearly a need to consider and take account of the potential intergenerational effects of government policy.

Ablett (1995) includes generational accounting results for Australia (with a 1990/91 base year) assuming annual real per capita growth in public health-care spending about double the level of the other generational account components up to 2009/10; the actual growth rate assumed corresponded to the growth in health care spending over the 1980s. The simulations imply that the increased health care spending could be financed without changing the generational accounts of future generations by increasing the Medicare levy to about 2.5 per cent of taxable income from the present figure of 1.5 per cent.

If it is accepted that public policy should be so conducted as to avoid large net redistributions of resources between generations, then the challenge is to formulate policies which further this aim without sacrificing the other aims of government. The compulsory superannuation system is an important example of such policies. The idea is that each generation should accept most of the responsibility for funding its own retirement incomes, ultimately making it easier to maintain generational balance in fiscal policy while ensuring that these incomes are adequate. More generally, a social welfare system could be based on intragenerational rather than intergenerational transfers to those in need. For example, the increasing public costs associated with aged health care could be funded by tightening the means test for receipt of public aged pensions, or by means testing the access of retirees to subsidised pharmaceuticals. In this way, older generations would take more responsibility

⁹ No moderation in public age pension payouts due to compulsory superannuation is factored into the generational accounts of Table 1.

ity for funding their own health care, although such policies would probably prove politically unpopular. In the long run, compulsory saving to provide for aged health care as part of the superannuation system could be a reasonable alternative.

A Broader Perspective on Intergenerational Balance

As it concerns only the relationship between generations and government, generational accounting says nothing about private intergenerational transfers. But whether or not a projected fiscal burden on future generations is so high as to imply the need for major policy changes clearly depends on future net private transfers between current and future generations. For example, the large projected public burden to be borne by future generations in the US may not be so alarming if the same generations can expect to receive a private windfall from older generations. This suggests a need to assess generational balance in a way that takes account of private intergenerational transfers such as bequests and gifts *inter vivos*.

Ablett (1996b) presents an accounting framework that includes both generational accounts and private transfers between generations, based on the aggregate present-value budget constraint of a generation (males and females combined). This constraint states that, in present value terms, a generation's remaining net private transfers to other generations equals the sum of its net wealth and remaining labour earnings minus the sum of its remaining consumption and aggregate generational accounts.¹⁰ Aggregating the present value of net private transfers to other generations of all currently living (alive in the base year) generations gives the present value of total net private transfers from these generations to future generations. If these net private transfers are negative, there will be net private transfers from future generations (born after the base year) to currently living generations. The total intergenerational account or contribution of all future generations can then be defined as the sum of their net fiscal burden, or aggregate generational accounts, and net private transfers to currently living generations.

Simulation results using this broad accounting framework are presented in Ablett (1996b). They suggest that, under reasonable assumptions, maintenance of 1990/91 age-specific rates of consumption by generations alive in Australia in 1990/91 over their remaining lifetimes would require relatively large net private transfers to these generations from future generations.¹¹ An implication would be that rates of consumption in Australia in 1990/91 were too high to suggest balance

¹⁰ The inclusion of capital income in this constraint would result in double counting; the return to capital is implicitly assumed to equal the discount rate used to calculate present values.

¹¹ These simulations made use of age- and gender-specific consumption and labour income profiles derived from the Australian Bureau of Statistics' 1988 Household Expenditure Survey and 1990 Household Income Survey, benchmarked to national aggregates. As for the consumption profile, the income profile was assumed to remain unchanged in the future, except for an assumed per capita growth rate. The required wealth estimates were obtained by distributing total net private sector wealth according to an age profile of interest, dividends and rent derived from the Household Expenditure Survey. More details are given in Ablett (1996b).

between the total intergenerational contributions of current and future generations, and thus could be considered unsustainable: future generations may not be willing or able to make the significant private transfers to current generations that a continuation of these consumption rates seems to demand. (Sufficiently high rates of productivity growth could, of course, alter this conclusion.) In these circumstances, it may be argued (in an intergenerational sense) that government should do more to promote sustainable consumption behaviour by, for instance, decreasing disincentives to save. But it is far from clear whether measures designed to increase incentives to save voluntarily, such as abolishing taxation of interest earned on savings accounts, would have a significant effect on saving behaviour.

Concluding Remarks

By focusing on the net fiscal burdens of different generations, generational accounting affords a long-term perspective on the effects of public policy. The continuing spread of its use worldwide will at least promote the consideration of intergenerational effects when determining policy. Despite its shortcomings, such as its dependence on particular incidence assumptions and neglect of relative price effects, it can provide a useful input in assessing the degree of fiscal responsibility being exercised.

While generational accounts are forward-looking, future fiscal burdens clearly depend to some degree on the legacy of the past. In this regard, the introduction of a system of government accrual accounting, as discussed by Albon (1995), would provide a useful adjunct to generational accounting. It would, for example, lead to more appropriate measures of government net wealth.

Beyond generational accounting and the pattern of private intergenerational transfers, other, less quantifiable, factors will undoubtedly influence the well-being of future generations. First, future generations will inherit a considerable amount of technology and accumulated knowledge. Advances in medical science, for instance, are likely to afford them longer and healthier average lifetimes. Second, it is difficult to gauge the true value of public and private accumulated capital to future generations. Forms of capital such as housing, roads and bridges cannot be liquidated or largely consumed by current generations, and hence will be passed on almost intact to future generations. Other forms of capital may be fully consumed by their current owners, while certain types of productive capital could simply become obsolete. (What will be the value of an oil refinery when there is no more oil?) These distinctions cannot be adequately captured by aggregate measures of net wealth or government capital.

Finally, an important issue is the quality of the environment which future generations will enjoy. The actions of current generations clearly will influence this, but it is difficult to value environmental damage, or indeed even to assess the long-term effects of various activities on the environment.

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