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6 Generational Accounting in Australia

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6.1 Introduction and Overview of Findings

Intergenerational issues have become increasingly important in fiscal policy debates in Australia in the past few years. The recently elected Liberal-National coalition government has vowed to bring the national government budget into surplus within the next few years and has announced its intention to slash expenditure in almost all areas. The baseline Australian generational accounts for 1994/95 reveal a moderate imbalance in favor of current generations, and thus a reversal of the imbalance evident in the 1990/91 base-year accounts (Ablett 1996). Such a deterioration in generational balance appears to vindicate the need for fiscal restraint. However, as shown in section 6.5, the fiscal constraint implied by recent official government projections should be sufficient to correct the projected generational imbalance. This result should add perspective to discussions of the need for further drastic expenditure cuts.

Specific attention is given in this country study to the effects of migration on generational accounts. The simulations suggest post-base-year migrants belonging to age cohorts alive in the base year are likely to make a significant net positive contribution to the Australian public sector. Furthermore, post-base-year migration will tend to result in a reduction in the generational accounts of future generations in Australia.

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6.2 Brief History of Australian Fiscal Policies and Current Fiscal Debates

Recent fiscal policy debates in Australia have been dominated by the issue of whether fiscal policy should be generally tightened, particularly in terms of restraining expenditures. Politically, those advocating significant fiscal tightening appear to have won the argument, with the new Liberal-National coalition government elected in March 1996 announcing wide-ranging cuts to expenditure as well as some revenue-raising measures. The main arguments put forward for fiscal tightening have been the desirability of reducing the relative size of the public sector in the economy, the need for government to play a role in improving national saving, and more recently, concerns about the fiscal burden to be inherited by young and future Australians. It is important to view these arguments in the context of recent history.

Throughout the 1970s and the first half of the 1980s the Australian national government consistently recorded official budget deficits ranging to over 4 percent of GDP. Shortly after its election in 1983 the Labor Party government promised that over the life of its term of office it would not increase tax revenue or government expenditure as a proportion of GDP and would reduce the budget deficit as a proportion of GDP. These promises were largely fulfilled. The federal government budget moved into surplus in 1987/88 and remained so up to the 1990/91 fiscal year.

The economic recession of the early 1990s was, however, met with a significant loosening of fiscal policy, demonstrating that the then federal Labor government had not completely abandoned traditional Keynesian pump-priming as a means of macroeconomic management. As a result of the economic recession and discretionary spending measures, general government net debt as a percentage of GDP increased from a low of 11 percent in June 1990 to 26 percent in June 1995. Most of this increase was caused by increases in federal government debt as opposed to state and local government debt. General government outlays rose from 31 percent of GDP in 1988/89 to almost 36 percent of GDP in 1992/93, while government revenue fell as a proportion of GDP over the same period. Recent government projections that assume significant fiscal constraint imply the underlying general government deficit will fall to 0.4 percent of GDP by 1998/99 (*National Fiscal Outlook* 1996). However, the current national government has announced that it will take additional measures to tighten fiscal policy even more rapidly.

Since 1993, Australia's economic growth performance has improved, but unemployment has remained at unacceptably high levels. In 1996 the official unemployment rate remained at around 8.5 percent of the workforce.

Against this backdrop there have been calls for an acceleration of the microeconomic and labor market reforms commenced by the Labor government in the mid-1980s. Centerpieces of microeconomic reform have been financial market deregulation, the lowering of domestic industry tariff protection, and the

promotion of competition in formally monopolized industries such as telecommunications and power generation. Numerous formerly government-owned enterprises such as the Commonwealth Bank have been fully or partly privatized. Labor market deregulation has focused on replacing centralized wage fixing by individual contracts between workers and their employers.

The growing opposition in Australia to big government implies that fiscal tightening should primarily be achieved through expenditure constraint, rather than general increases in the burden of taxation. Nevertheless, taxation reform is a keenly debated issue in Australia, with numerous economic commentators advocating a change in the tax mix to one with less distortionary effects on economic incentives to work, save, and invest. In this regard, the proposal to introduce a comprehensive consumption (value added) tax in Australia, first suggested in 1985, is now again being discussed seriously, despite being rejected by voters at the 1993 national election; the current government has promised not to introduce such a tax before the next national election.

The Australian social security system is also the subject of expenditure cuts. This is despite the fact that over the past decade most social security benefits have been increasingly means tested and targeted to specific disadvantaged groups. Some argue that there is still scope for reducing so-called middle-class welfare outlays, including family payments (related to the number of dependent children) to middle-income households. There is considerable political resistance to reducing such outlays; however, the current government has recently announced measures that reduce benefits to the middle class in the form of subsidized higher education and nursing home care.

Australia has a national health scheme (Medicare), originally introduced in the 1970s, that provides free public hospital care and free or subsidized consultations with medical practitioners.[1] Individuals may also purchase private insurance to cover the costs of private hospital treatment and a number of other medical expenses not included in the national scheme. Currently, about 15 percent of the cost of Medicare is met by a levy currently set at 1.5 percent of taxable income for most taxpayers. Historically the Medicare system has been reasonably successful in keeping down the cost of public health care in Australia, compared to other developed countries. This has changed somewhat in recent years with large increases in government health outlays, especially for pathology/diagnostic services and subsidized pharmaceuticals. The public hospital system has also been put under pressure by a continuing exodus of individuals from private health insurance. The present national government has announced some measures to limit the growth in public health care outlays and encourage people to take out private health insurance, but it is unlikely these will be sufficient.

1. Over time, out-of-pocket medical expenses have tended to increase in line with a widening gap between actual doctors' fees and the amount Medicare reimburses. This is especially so for specialist services, although competition has ensured a zero copayment for most visits to general practitioners.

As in other countries, a major concern with public health care and other social security expenditures in Australia is aging of the population. The fear is that the public cost of supporting the elderly will lead to exaggerated tax burdens on future generations. In response to this perceived problem, compulsory saving for retirement has been introduced, as represented by the Superannuation Guarantee Charge (SGC). One of the main aims of the SGC is to moderate 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. Additional contributions to the savings accounts by employees themselves amounting to at least 3 percent of earnings are also foreseen. 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. In view of the lengthy phase-in time, it is not expected that the SGC will lead to significant moderation of public retirement pension outlays over the next 20 years. However, over the long term, the effects should be large.

An additional key, but contested argument for compulsory saving for retirement in Australia is its supposed positive effect on national saving. Average household saving as a percentage of after-tax income fell from about 11 percent in the late 1970s to 3 percent in 1994/95. Australian public sector dissaving has also generally increased over the past decade. The country's reliance on foreign savings has manifested itself by substantial current account deficits over the past 15 years ranging between 3 and 6 percent of GDP. The 1994/95 ratio of current account deficit to GDP was 5.9 percent, higher than in all OECD countries except Mexico. At the present time, the main component of the Australian current account deficit is the net income deficit, largely representing interest payments on foreign debt accumulated during the past decade.

While Australian governments have historically rejected the extreme view that there is a direct link between government budget deficits and current account deficits, there is widespread support for measures to reduce the public sector's dissaving and demand for loanable funds. Indeed the perceived need to increase national saving is the principal reason advanced by the current national government for fiscal tightening.

6.3 Brief Description of Data Sources

The Australian generational accounts refer to the base year of 1 July 1994 to 30 June 1995, since the Australian financial year starts in July.

Four sets of population projections for years up to 2100 are used in this chapter's calculations, each corresponding to a different migration scenario. All four are based on assumptions described in the published projections of the Australian Bureau of Statistics (1994), which suppose improvements in

age/gender-specific mortality rates up to 2041 and a constant total fertility rate per woman of 1.884. For the purposes of the Australian generational accounts it was assumed that no further improvements in mortality would occur after 2041.

The first set of population projections represents a zero post-base-year migration counterfactual. It was calculated by applying the assumed age/gender-specific mortality rates and age-specific fertility rates to the cohorts alive in each year, starting with the resident population surviving to year 1994/95. Thus it assumes zero net migration after the base year. In this case the total Australian population is projected to reach a maximum of about 20.2 million in 2030 and then decrease steadily, reaching a level of 16.7 million by 2100, which is less than the current population.

Two further sets of population projections ("low" and "high") were calculated by extending the Australian Bureau of Statistics low and high population series for 1993–2041 up to 2100. These projections incorporate steady increases in net migration up to 2001, after which annual net migration remains constant at 70,000 and 100,000 for the low and high series, respectively. They assume the relative age and gender composition of migration by category of movement (permanent or long-term arrivals or departures) after 1994/95 will remain constant at the average composition for the years 1990/91 to 1992/93. Total population increases steadily for both the low and high series, reaching 27.8 and 32.2 million, respectively, by 2100.

A third "super high" population scenario assumes net annual migration to Australia of 150,000 for all years after 1994/95. The relative age and gender composition of this net migration is assumed to be the same as that for the other sets of population projections incorporating positive migration. Total population increases to 40.6 million by 2100 under the super high scenario.

Results given in section 6.4 and subsection 6.5.1 are based exclusively on the low series (low migration) scenario. Under this scenario the elderly dependency ratio (the number aged 65 or older as a percentage of the number aged 18 to 64) rises from 19.2 percent in 1995 to about 38.5 percent in 2040, after which it remains stable; the child (ages 0 to 17) dependency ratio is projected to decrease from 41.2 percent in 1995 to 36.0 percent in 2020. The projected changes in elderly and child dependency ratios roughly cancel each other out over the next 20 years, leaving the total dependency ratio fairly stable over this period at about 60 percent. Beyond this time frame, a stable child dependency ratio and continued aging of the population result in the total dependency ratio increasing steadily to its long-run level of about 75 percent by 2040.

In establishing the Australian generational accounts, payments to government were divided into indirect taxes and taxes on labor income, capital income, and property. Benefits from government included age pension, family and child, unemployment, and other social security benefits, and transfer payments related to education and health care. Age/gender profiles of all these payments and benefits in 1994/95 were derived using data from the Australian

Bureau of Statistics 1988 Household Expenditure Survey and 1990 Household Income Survey, benchmarked against national account and government finance aggregates.

Recent educational participation rates and profiles of health care consumption (from survey data) by age and gender were used to adjust the educational and health components of projected government consumption expenditure projections for changing demographic composition. Except for subsidies to industry, all other components of government consumption expenditure were assumed to increase at the general per capita income growth rate, unless otherwise stated.[2] Subsidies to industry were assumed to remain constant at their real 1994/95 level; these have remained fairly constant over the past half-decade, and both the new Australian national government and the major opposition party are committed to reducing industry protection. Net transfers to government from public trading enterprises in the base year were treated as negative government consumption expenditure. The government net wealth estimate used was general government net debt.

6.4 Basic Findings and Sensitivity Analysis

The following baseline Australian generational accounts, referring to the base year 1 July 1994 to 30 June 1995, use the low population (low migration) described in section 6.3. A low migration scenario is considered most realistic given recent experience and moves to limit the growth of annual migration to Australia. In the results of this section, all per capita payments, benefits, and government consumption expenditure (except for subsidies to industry) are assumed to grow at the general rate.

As can be seen in tables 6.1 and 6.2, there is a moderate generational imbalance in favor of current generations for all discount rate and growth rate combinations presented. The deterioration in generational imbalance in Australia since 1990/91 is mainly due to increased government purchases, increased government indebtedness, and cyclical changes in government revenues and transfer payments. Fiscal year 1990/91 was the last in which the federal government officially recorded a surplus; an economic recession was experienced over the next few years.

Table 6.3 provides a decomposition of the baseline accounts of table 6.1 for persons by the various tax and transfer components used. It can be seen that the major component affecting the accounts of elderly generations is age pension receipts.[3]

2. Government consumption aggregates from the Australian national accounts include estimates of consumption of fixed capital.

3. The health component in the accounts does not include in-kind benefits such as free treatment in public hospitals. Expenditure on these services is included in public consumption expenditure in establishing the accounts.

Table 6.1 **Present Value of Net Tax Payments per Capita (thousands of U.S. dollars)**

Generation's Age in 1994/95	All Persons	Males	Females
0	79.6	105.1	52.8
5	95.3	125.0	64.0
10	112.8	147.5	76.7
15	134.3	174.2	92.1
20	148.4	192.2	102.6
25	147.7	196.0	98.5
30	138.5	187.0	90.6
35	128.2	171.3	85.0
40	111.9	149.1	75.0
45	87.4	119.7	54.4
50	57.4	85.1	28.7
55	25.9	46.9	3.6
60	1.5	15.6	−12.6
65	−12.7	−3.9	−21.3
70	−17.6	−9.6	−24.6
75	−16.1	−7.4	−23.0
80	−13.8	−6.3	−18.6
85	−11.3	−5.3	−14.4
90	−9.4	−6.1	−10.7
Future generations	105.2		

Note: Real income growth assumed to be 1.5 percent; discount rate, 5 percent.

In view of the comments about fiscal tightening made previously, there is reason to believe that these base-case results present a somewhat pessimistic assessment of generational imbalance, a point taken up in the next section.

6.5 Generational Impact of Alternative Policies

6.5.1 Effects of Budget Restraint and the Small Country Assumption

Table 6.4 reveals how the Australian accounts change as a result of several immediate and permanent policy changes that would imply generational balance: a 5.1 percent increase in all tax revenues, a 12.1 percent decrease in all transfer payments, and an 8.8 percent decrease in government purchases. Comparing the first two of these scenarios, we see that current generations up to 40 years of age would be marginally better off under a cut in transfer payments, but those older than 40 years would be decidedly worse off under this policy. This result is expected given the importance of transfer receipts to the elderly and taxation payments by the young.

The results of four other simulations are given in table 6.5. The assumptions behind each of these and a discussion of the results are given below.

Table 6.2 **Present Value of Net Tax Payments per Capita for All Persons (thousands of U.S. dollars)**

	$g = 1$			$g = 1.5$			$g = 2$		
	$r = 3$	$r = 5$	$r = 7$	$r = 3$	$r = 5$	$r = 7$	$r = 3$	$r = 5$	$r = 7$
Present generation	138	66	32	167	80	39	203	96	47
Future generations	187	91	58	247	105	63	362	124	70
Absolute imbalance	49	25	26	80	25	24	159	28	23
Percentage imbalance	36	38	80	47	32	63	78	29	50

Note: g is productivity growth rate (percent); r is discount rate (percent).

Table 6.3 **Decomposition of Generational Accounts for All Persons by Tax and Transfer Components (thousands of U.S. dollars)**

A. Ages 0 to 45

Generational Account Component	Generation's Age in 1994/95									
	0	5	10	15	20	25	30	35	40	45
Labor income tax	53.3	62.2	72.0	84.1	91.5	89.5	81.4	73.0	61.5	47.9
Capital income tax	21.2	24.7	28.6	33.5	37.4	41.9	45.9	48.0	49.4	50.0
Property tax	9.9	11.5	13.4	15.6	17.7	20.1	21.6	21.9	21.6	20.1
Indirect tax	43.5	50.6	58.8	68.5	72.2	66.5	60.5	55.8	51.3	44.5
Total payments (1)	127.9	149.0	172.8	201.7	218.8	218.0	209.4	198.7	183.8	162.5
Age pension	10.1	11.8	13.7	16.0	18.1	20.8	24.0	27.5	31.9	37.1
Family benefits	6.5	7.5	8.8	10.1	11.3	11.7	10.2	7.1	3.8	1.6
Educational benefits	3.5	4.0	3.6	3.2	2.2	1.3	0.9	0.8	0.7	0.7
Health benefits	11.5	10.9	11.3	11.7	11.5	11.5	11.3	10.9	11.0	11.0
Other social security	16.7	19.5	22.6	26.4	27.3	25.0	24.5	24.2	24.5	24.7
Total benefits (2)	48.3	53.7	60.0	67.4	70.4	70.3	70.9	70.5	71.9	75.1
Generational account (1) − (2)	79.6	95.3	112.8	134.3	148.4	147.7	138.5	128.2	111.9	87.4

(continued)

Table 6.3 (continued)

Generational Account Component	B. Ages 50 to 90								
	Generation's Age in 1994/95								
	50	55	60	65	70	75	80	85	90
Labor income tax	33.8	20.0	8.8	2.6	1.2	0.7	0.4	0.3	0
Capital income tax	49.1	46.6	43.1	36.6	29.5	23.5	18.4	14.0	10.5
Property tax	18.3	16.1	14.0	11.8	9.4	7.5	6.0	4.6	3.5
Indirect tax	36.1	27.2	20.5	15.4	11.2	8.2	6.8	4.5	3.3
Total payments (1)	137.3	109.9	86.4	66.4	51.3	39.9	31.6	23.4	17.3
Age pension	43.4	50.8	60.1	61.1	54.6	45.5	37.0	28.2	21.7
Family benefits	0.6	0.2	0	0	0	0	0	0	
Educational benefits	0.5	0.4	0.2	0	0	0	0	0	0
Health benefits	10.8	10.5	9.8	9.2	7.7	6.2	4.9	3.7	2.8
Other social security	24.6	22.1	14.8	8.8	6.6	4.3	3.5	2.8	2.2
Total benefits (2)	79.9	84.0	84.9	79.1	68.9	56.0	45.4	34.7	26.7
Generational account (1) − (2)	57.4	25.9	1.5	−12.7	−17.6	−16.1	−13.8	−11.3	−9.4

Note: Real income growth assumed to be 1.5 percent; discount rate, 5 percent.

Table 6.4 **Policy Options: Present Value of Net Tax Payments per Capita for All Persons (thousands of U.S. dollars)**

Generation's Age in 1994/95	Base Case	Policy Scenario Implying Generational Balance		
		5.1% Increase in Tax Revenues	12.1% Decrease in Transfers	8.8% Decrease in Government Purchases
0	79.6	86.1	85.5	79.6
5	95.3	102.9	101.8	95.3
10	112.8	121.6	120.1	112.8
15	134.3	144.6	142.5	134.3
20	148.4	159.5	156.9	148.4
25	147.7	158.7	156.2	147.7
30	138.5	149.1	147.1	138.5
35	128.2	138.3	136.7	128.2
40	111.9	121.2	120.6	111.9
45	87.4	95.6	96.5	87.4
50	57.4	64.4	67.1	57.4
55	25.9	31.4	36.0	25.9
60	1.5	5.9	11.8	1.5
65	−12.7	−9.3	−3.1	−12.7
70	−17.6	−15.0	−9.2	−17.6
75	−16.1	−14.1	−9.4	−16.1
80	−13.8	−12.2	−8.3	−13.8
85	−11.3	−10.1	−7.1	−11.3
90	−9.4	−8.5	−6.1	−9.4
Future generations	105.2	86.1	85.5	79.6

Note: Real income growth assumed to be 1.5 percent; discount rate, 5 percent.

Small Country Assumption

In this simulation the "small country assumption" is used, whereby the incidence of corporate income taxes is supposed to fall on labor income. This assumption is based on the hypothesis that in a small open economy (such as Australia) taxes on mobile capital are borne by the nonmobile factor of production (labor). Its application results in generational imbalance increasing to 49 percent, with quite large decreases in the accounts of middle-aged and elderly current generations, and marginal increases in the accounts of those under age 30 in the base year. Since capital ownership is more concentrated among older generations, this result is not surprising.

Moderate Fiscal Constraint

This scenario applies the public sector total outlay and revenue projections up to fiscal year 1998/99 contained in the *National Fiscal Outlook* (1996). These projections take account of specific announced policy measures as at May 1996 but do not include the A$8 billion (about U.S.$6.2 billion) cut to the official national government deficit over 1996/97–1997/98 foreshadowed

Table 6.5 **Other Assumptions: Present Value of Net Tax Payments per Capita for All Persons (thousands of U.S. dollars)**

Generation's Age in 1994/95	Scenario				
	Base Case	Small Country Assumption	Moderate Fiscal Constraint	High Fiscal Constraint	Zero Age Pension Growth
0	79.6	83.0	84.1	85.1	86.2
5	95.3	99.3	100.4	101.5	102.7
10	112.8	117.4	118.6	119.8	121.0
15	134.3	139.7	140.8	142.2	143.4
20	148.4	153.5	155.2	156.6	158.0
25	147.7	149.1	154.5	155.8	158.0
30	138.5	134.4	145.2	146.6	149.5
35	128.2	119.8	134.8	136.2	139.7
40	111.9	98.7	118.4	119.8	123.8
45	87.4	69.2	93.8	95.3	99.5
50	57.4	35.0	63.7	65.3	69.3
55	25.9	0.5	31.9	33.5	37.1
60	1.5	−25.4	7.0	8.6	11.3
65	−12.7	−37.2	−8.0	−6.5	−4.9
70	−17.6	−37.8	−13.7	−12.5	−11.8
75	−16.1	−32.8	−13.2	−12.3	−12.2
80	−13.8	−26.8	−11.6	−10.9	−11.3
85	−11.3	−21.2	−9.8	−9.3	−9.9
90	−9.4	−16.7	−8.4	−8.1	−8.6
Future generations	105.2	123.7	75.3	66.2	82.6
Percentage imbalance	32.2	49.0	−10.5	−22.1	−4.2

Note: Real income growth assumed to be 1.5 percent; discount rate, 5 percent.

by the recently elected government. They foresee total government outlays falling from 34.9 percent of GDP in 1994/95 to 32.6 percent of GDP in 1998/99, with total government revenue falling marginally as a percentage of GDP up to 1998/99. In calculating the accounts for this scenario, the annual percentage changes in total outlays and revenue implied by the projections were applied uniformly to all generational account benchmarking aggregates; the general per capita growth rate was applied to all years after 1998/99.

The fiscal constraint (compared to 1994/95) implied by the *National Fiscal Outlook* projections leads to substantial changes in the generational accounts, indicating that the baseline 1994/95 Australian accounts represent a somewhat pessimistic view. Generational imbalance is reversed with the generational account of future generations becoming 10.5 percent less than that of base year newborns.

High Fiscal Constraint

This scenario is similar to the moderate fiscal constraint scenario except that it factors in additional A$4 billion (about U.S.$3.1 billion) cuts to projected

government outlays in both 1996/97 and 1997/98. The implied percentage changes in total outlays are applied uniformly to all benchmarking outlay aggregates.[4] This scenario is designed to give an approximate indication of the possible effects of the current federal government's stated goal of balancing the official federal government budget by the end of the 1997/98 financial year. It leads to a doubling of the percentage imbalance in favor of future generations evident in the results for the moderate fiscal constraint scenario.

Zero Age Pension Growth

This scenario is the same as the baseline scenario except that it assumes zero growth in per capita public age pensions after the base year. Such a scenario is relevant in view of the move toward self-funded retirement incomes in Australia, although under current rules compulsory saving for retirement is unlikely to have a significant moderating effect on public age pension benefits until well into the next century (Ablett 1996). It leads to a marginal imbalance in favor of future generations, representing a significant shift compared to the baseline accounts.

6.5.2 Role of Migration in the Net Fiscal Contributions of Generations

Do immigrants contribute less to the public sector of the host country than they receive in return?[5] Australia has traditionally been among those countries with the highest ratios of migrant to native born; therefore, it is of interest to investigate how immigration affects the generational accounting results for this country.

Two conclusions emerge from the simulation results presented in this section.[6] First, future migrants belonging to generations alive in 1994/95 (the base year of the calculations) are likely to make a substantial net positive direct contribution to the Australian public sector. Second, when the implied per capita fiscal burden to be borne by future generations is considered, future migration per se is also projected to have a net positive effect on public sector resources.

The above conclusions can be understood by way of an example. Consider a historically typical migrant to Australia who arrives after completing her formal education in her country of origin. Arriving at the start of her working life, she will tend to make net positive contributions to the public sector over many

4. There will of course be a number of changes on the revenue side of government finances as well, such as the raising of the national health care (Medicare) levy on high-income earners who do not have private health insurance. It is felt, however, that reducing projected outlays in the manner described captures the main generational implications of the announced generalized fiscal constraint.

5. The general issue of economic gains from migration is not considered here. Borjas (1994, 1995) provides comprehensive reviews of the issues involved.

6. Except for varying migration assumptions, this section makes the same assumptions as used in establishment of the base-case accounts of section 6.4 (including a 5 percent discount rate and a 1.5 percent growth rate). The qualitative results reported in this section are the same under all the discount and real income growth rate combinations considered in section 6.4.

years through the taxation and social security system. In present value terms, the burden she will represent for the public sector once retired will be minimal. If the experience of a sufficient number of migrants approaches this stylized example, the first conclusion above is not surprising.

However, the second conclusion need not be so clear-cut. Our "typical" migrant, being younger than the average age of all Australian residents, contributes to a moderation in the aging of the population. Supposing she is indeed a female, she renders the age pyramid of females younger, and hence the overall birthrate higher than it would have been otherwise. This will be the case even if, as assumed here, migrant women display the same age-specific fertility rates as women in Australia generally. The increased birthrate will, however, lead to increased demands on public sector resources associated with the education and welfare of greater numbers of children; there will also be greater infrastructure needs for the larger population. The results presented in this section suggest that these increased demands on the public sector are not sufficiently important to lead to an increase in the generational accounts of future generations.

There have been numerous studies that specifically try to gauge the impact of migration on the public purse, particularly in North America and Australia.[7] In contrast to the long-term generational accounting approach used here, most previous studies in this area have tried to assess the impact of migrants on public sector finances in a given year and have not considered all payments to and all benefits received from all levels of government.

Some could argue that generational accounting is an inadequate vehicle for examining the direct net contribution of migrants to government because it ignores differences in average payment and benefit levels between migrants and nonmigrants belonging to the same age/gender cohort. However, previous Australian studies (e.g., Whiteford 1991) suggest that such differences may not be great and are mainly associated with the settling-in period of recent arrivals. More important, the validity of generational accounting in this context does not depend primarily on whether there are systematic differences between net payments to government by migrants and nonmigrants, but rather on the extent to which the average net payments of post-base-year migrants differ from those of the resident base-year population. Inasmuch as the resident population already contains a relatively high proportion of migrants, as in Australia, the average net payment differences between residents and future migrants of the same age may not be large. If this is the case, it is reasonable to conclude that general population level and age composition considerations hold the key to gauging the likely overall direct long-term contribution of future migration to the public purse. The approach used here is based on this view.

7. Notable North American studies include Blau (1984), Jensen (1989), and Simon (1989). Australian studies include Whiteford (1991) and Centre for International Economics (1992).

Migration and the Generational Accounts of Current Generations

To understand how migration affects generational accounts, one should first recall that the per capita generational account for each currently living cohort is usually calculated by dividing the cohort's total account by the number of members of the cohort *alive and resident* in the country in the base year. However, the cohort's total account will be affected by migration. Consider the case of 20-year-olds in the base year. If there is no migration of people belonging to this age cohort after the base year and all the other assumptions of the generational accounting exercise are satisfied, then calculation of this cohort's generational account in the manner described above will indeed give a valid indication of the average remaining lifetime net fiscal burden facing base-year resident members of this cohort. However, if foreigners aged 20 in the base year migrate subsequent to the base year, then, ceteris paribus, the generational account so calculated will not, strictly speaking, represent the net present value of tax contributions of 20-year-olds resident in the country in the base year. This is explained by the fact that post-base-year migration swells the numbers of members of a given cohort alive in future years, leading to a change in the cohort's total calculated net contribution. The same reasoning obviously applies to all cohorts alive in the base year.[8]

A failure to separate out the impact of migration on the generational accounts of generations alive in the base year effectively means that these generations are projected to live longer than they actually do. Thus the future arrival of migrants will increase the survival rate of a generation to a given future year if this is calculated as the ratio of the number of cohort members (including post-base-year migrants) resident in the given future year to the number of cohort members resident in the base year.

Table 6.6 shows generational accounts of those alive in the base year under zero post-base-year migration and the low, high, and super high population scenarios described above that assume successively higher levels of future migration. The last row of the table gives the percentage increase in the aggregate generational accounts of all currently living generations compared to the zero migration scenario.

The message from table 6.6 is quite clear. For generations up to 50 years of age in 1994/95, post-1994/95 migrants belonging to these generations are projected to contribute directly, in aggregate, positive net present value amounts to the Australian public sector, at least before government consumption expenditure is considered. This is implied by the increased generational accounts of these cohorts compared to the zero post-1994/95 migration scenario. It is also evident that higher migration accentuates this positive net con-

8. In view of the argument presented here, it may be desirable in general to calculate the accounts of currently living (resident) generations by excluding the contributions of post-base-year migrants from the aggregate account of each generation.

Table 6.6 **Population Scenarios: Present Value of Net Tax Payments per Capita for All Persons (thousands of U.S. dollars)**

Generation's Age in 1994/95	Post-1994/95 Population Scenario			
	Zero Migration	Low	High	Super High
0	66.1	79.6	84.9	94.1
5	81.6	95.3	100.7	110.3
10	98.9	112.8	118.3	128.0
15	120.0	134.4	140.1	150.5
20	138.0	148.4	153.6	163.2
25	139.4	147.7	151.7	160.6
30	132.5	138.5	141.1	147.0
35	125.0	128.2	129.4	132.4
40	110.2	111.9	112.4	113.9
45	86.9	87.4	87.6	88.2
50	57.4	57.4	57.4	57.8
55	26.1	25.8	25.8	26.0
60	1.8	1.5	1.4	1.5
65	−12.3	−12.7	−12.8	−12.6
70	−17.2	−17.6	−17.6	−17.4
75	−15.8	−16.1	−16.2	−15.9
80	−13.5	−13.8	−13.8	−13.5
85	−11.0	−11.3	−11.4	−11.0
90	−9.1	−9.4	−9.6	−9.1
Percentage aggregate increase		6.96	9.90	15.74

Note: Real income growth assumed to be 1.5 percent; discount rate, 5 percent.

tribution. The greatest net positive contributions are associated with young cohorts. This is largely explained by two factors. First, the composition of currently recorded and future projected migrant intakes is such that many migrants receive all or most of their education in their home countries before migrating to Australia between ages 20 and 40 and joining the (taxpaying) adult workforce. Second, there will be significantly more future migrants coming from younger 1994/95 age groups than from older age groups.

The story for those over 50 years of age in 1994/95 is different. As future migrants in these cohorts will arrive either shortly before retirement or after retirement, their generational account contribution will mostly be negative, thus adding to the public burden of supporting the aged population. However, since migrants in these age groups represent a relatively minor proportion of migrant intakes, their negative contributions are not sufficient to make the total net contribution over all cohorts negative.

The total percentage increases over all cohorts given in the last row of table 6.6 are arguably quite significant. For example, under the high population

Table 6.7 **Contribution of Future Migration of Cohorts Alive in 1994/95 (thousands of U.S. dollars per migrant)**

	Population Scenario		
	Low	High	Super High
Per migrant generational account contribution	58.8	59.3	60.2
Government consumption per migrant	44.1	43.1	41.7
Net contribution per migrant	14.7	16.2	18.5

Note: Real income growth assumed to be 1.5 percent; discount rate, 5 percent.

(high migration) scenario, future migration of members of generations alive in 1994/95 is projected to increase directly the aggregate generational account contribution of these cohorts by almost 10 percent.

Whether future migrants belonging to generations alive in the base year will make an overall net positive contribution to the public sector also depends on the increase in public consumption expenditure associated with them. However, it is possible to calculate this amount given the assumptions relating to government consumption expenditure in the base-case generational accounts. For each migration scenario, table 6.7 shows the per migrant generational account contribution, government consumption expenditure and the difference between these two amounts (the "net contribution") for those alive in (but migrating after) the base year.[9] Note that the first of these amounts is not comparable to the generational accounts of base-year residents since it refers to contributions by post-base-year migrants belonging to many different generations and migrating over possibly many future years.

One notes that the overall net contributions in table 6.7 are indeed positive. The simulations also show a significant reduction in the net contribution of migrants when the migration-associated increase in government consumption expenditure is included. Since the assumed age structure of arriving migrants is the same under each scenario, the differences in results across scenarios in table 6.7 are purely due to differences in the timing of net migration increases.

Migration and the Generational Accounts of Future Generations

So far we have considered only the contributions of future migrants alive in the base year. To gauge the net contribution of future migration per se on government resources it is necessary to investigate its effect on the per capita generational accounts of future generations.

By definition, the change in the projected aggregate generational account of all future generations due to post-base-year net migration will equal the change

9. The per migrant averages in table 6.7 were calculated by dividing the appropriate aggregate contributions of all post-1994/95 migrants alive in 1994/95 by the projected total net migration of these cohorts post-1994/95.

in the present value of future government consumption expenditure minus the change in the aggregate generational accounts of currently living generations; migration affects future government consumption not only directly, but also indirectly by increasing the number of future births. Some care is needed, however, in calculating the per capita generational accounts of future generations if the overall effect of migration is to be assessed. To clarify this, we can decompose the total generational accounts of future generations in the following way:

$$(1) \qquad \sum_{s=1}^{\infty} N_{t,t+s} = \sum_{s=1}^{\infty} N^{d}_{t,t+s} + \sum_{s=1}^{\infty} N^{m}_{t,t+s}.$$

In equation (1), $N^{d}_{t,t+s}$ is the aggregate generational account of domestic born members of future generations (born after the base year), while $N^{m}_{t,t+s}$ is the present value of the aggregate net fiscal contribution (in terms of generational account components) of future migrants belonging to future generations. In calculating the results so far presented in this country study, it has been assumed implicitly that the net fiscal burden on a given future generation is borne completely by domestic born members of that generation. In other words it has been assumed that $N^{m}_{t,t+s}$ $(s \geq 1)$ is zero. But where migration is significant, it is important to make some alternative assumption about how a future generation's net fiscal burden is to be shared between domestic born and migrant members of the generation; otherwise, any positive effect of migration will be understated. The assumption made here is that future migrants born in the future make the same age-specific generational account contributions as those resident in the base year, except for an adjustment for growth (using the assumed general growth rate). Under this assumption, an individual born overseas in year $t + s$ $(s \geq 1)$ and migrating to Australia in year $t + x$ $(x \geq s)$ would on average face a generational account burden on arrival of $n_{t,t-(x-s)}(1 + g)^{x}$, where $n_{t,t-(x-s)}$ is the per capita generational account of those aged $x - s$ years in the base year and g is the annual growth rate.[10]

Table 6.8 shows the generational accounts of future generations *born in Australia* under the above assumption about the division of the projected total net fiscal burden on future generations between Australian- and overseas-born members of these generations. It is assumed that the generational accounts (at birth) of Australian-born members of all future generations are the same except for the general per capita growth.[11]

It is evident from table 6.8 that under the assumptions of the generational

10. In obtaining the results in table 6.8 using this assumption, the generational accounts of base-year residents were calculated excluding the contributions of post-base-year migrants from the aggregate account of each generation.

11. A comparison of table 6.8 with table 6.1 shows that the assumption regarding the sharing of a future generation's net fiscal burden between migrants and nonmigrants leads to a reduction in the account of future generations from $105,200 to $92,000.

Table 6.8 **Generational Accounts of Future Generations Born in Australia (thousands of U.S. dollars per migrant)**

	Post-1994/95 Population Scenario			
	Zero Migration	Low	High	Super High
Generational account	95.9	92.0	90.1	86.5
Percentage change due to migration		−4.1	−6.0	−9.8

Note: Real income growth assumed to be 1.5 percent; discount rate, 5 percent.

accounting exercise positive post-base-year migration is projected to have a favorable effect on the generational accounts of future generations, and that this effect is greater the higher the level of migration. For example, the high population (high migration) scenario would reduce the generational accounts of future generations by 6.0 percent compared with the zero migration counterfactual.

6.6 Brief Summary and Conclusion

The Australian baseline accounts for 1994/95 show a generational imbalance of 32.2 percent. This result is based on applying the uniform growth rate of 1.5 percent per annum to all per capita payments and benefits after the base year and assuming a low net migration scenario. If the fiscal constraint inherent in recent government projections is indeed realized, the baseline imbalance result is likely to be reversed, as suggested by the simulations of the previous section. A similar reversal of imbalance is projected to occur if the baseline scenario is altered simply by holding real per capita age pension benefits constant at their base-year levels.

The results reinforce the view that the level of net payments by government to older generations is the most important policy factor in the redistribution of resources between generations in Australia. Discretionary government expenditure is also important; however, it is more easily altered over the short term. The move to privately funded retirement incomes could prove the most significant element in the determination of generational imbalance over the long term.

The simulations relating to migration imply that post-base-year migration should have an overall positive generational effect, as reflected in a reduction in the generational accounts of future generations. This result is mainly driven by the relative dominance of young working-age people in the composition of migrant intakes, compared to the resident Australian population. In the future it would be desirable to see whether this conclusion is supported by similar analyses in other countries with relatively high rates of migration.

References

Ablett, J. 1996. Generational accounting—An Australian perspective. *Review of Income and Wealth* 42 (1): 91–105.

Australian Bureau of Statistics. 1994. Projections of the populations of Australia, states and territories 1993–2041. Catalogue no. 3222.0. Canberra: Australian Bureau of Statistics.

Blau, F. 1984. The use of transfer payments by immigrants. *Industrial and Labour Relations Review* 37:222–39.

Borjas, G. J. 1994. The economics of immigration. *Journal of Economic Literature* 32 (4): 1667–1717.

———. 1995. The economic benefits of immigration. *Journal of Economic Perspectives* 9 (2): 3–22.

Centre for International Economics. 1992. Immigration and the Commonwealth budget. Canberra: Government Publishing Service.

Jensen, L. 1989. *The new immigration: Implications for poverty and public assistance utilization.* Studies in Social Welfare Policies and Programs, vol. 10. New York: Greenwood.

National fiscal outlook—Report to the 1996 premiers' conference. 1996. Canberra: Government Publishing Service.

Simon, J. 1989. The economic consequences of immigration. New York: Blackwell.

Whiteford, P. 1991. Immigrants and the social security system. Bureau of Immigration Research. Canberra: Government Publishing Service.