Conceptual Challenges on the Road to the Second Intergenerational Report

David Gruen and Jim Thomson

Macroeconomic Group

The Treasury

Conference of Economists

Hobart

25 September 2007

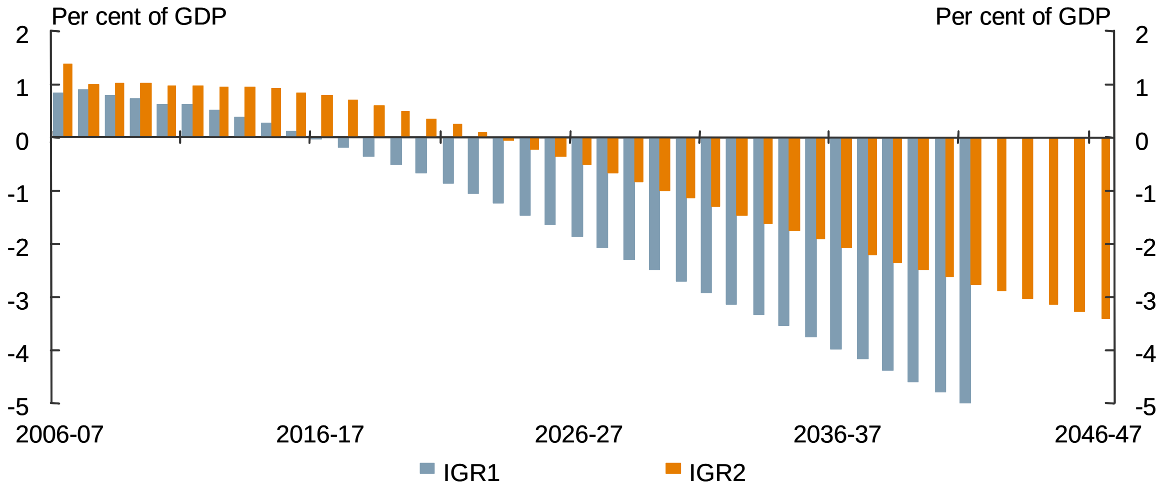
JEL Codes: H51, J11 and J21

We are grateful to Steven Kennedy, Paul Roe, Julie Tinnion and David Tune for helpful comments. The views expressed are those of the authors and not necessarily those of the Australian Treasury or the Australian Government.

Introduction

On 2 April this year, the Treasurer released IGR2 — the second intergenerational report on the Australian Government's long-term fiscal outlook and the sustainability of current government policies.[1] It is now quite well known that IGR2 projects that under current policies, the government's primary balance, which at present is positive, will become negative in the early 2020s, and that the deficit will continue to grow, reaching 3½ per cent of GDP by 2046–47. It is also well known that the projected fiscal gap is considerably smaller than in the first intergenerational report, released back in 2002 (Chart 1).

Chart 1: Comparison of IGR1 and IGR2 projected primary balances



It is not our purpose in this talk to take you through the IGR results — that has been done several times before. Instead, we want to look more closely at three factors that have led to the more favourable outcomes in IGR2, and use them to illustrate the challenges involved in making long-term projections.

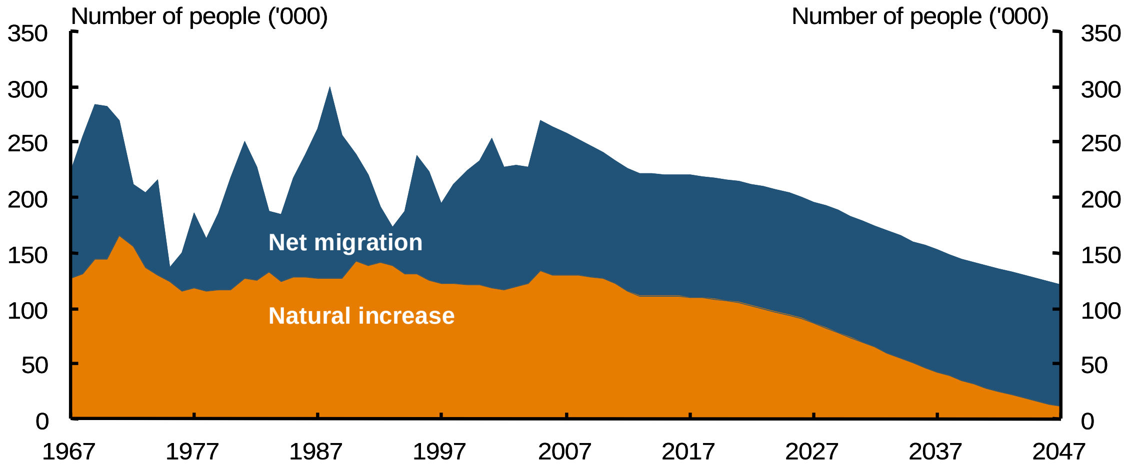
The first factor is migration, where increases in numbers and in the proportion of younger, skilled migrants are projected to lead to faster growth of real GDP and, more interestingly, real GDP per person. The second factor is higher labour-force participation, particularly by older workers. And finally, since rising health spending by the Australian government plays such a significant role in the longer term projected fiscal deterioration, I'll look at the projections of the fastest growing component of that spending – spending on pharmaceutical benefits.

[1] The *Intergenerational Report 2007*; available at www.treasury.gov.au/igr.

Migration

Let's start with migration. Net overseas migration — foreigners coming to live in Australia less Australians going overseas to live — currently accounts for about half the increase in Australia's population each year. By 2047, however, it is projected to account for almost all of the increase (Chart 2).

Chart 2: Net migration and natural increase in population



We often point out that IGR projections are just that — projections — not predictions — and migration is a good example of this. It is very difficult to know what net migration levels will be 40 years from now. Even if we take policy about the number of immigrants as given, the number of emigrants is not under policy control. Nor is the age or gender composition of migration, although migration policy can favour particular groups.[2]

IGR projections of net migration are based on average numbers of migrants in recent history and the age and gender composition in the most recent year for which data are available. In the IGR1 projections, we assumed net annual migration of 90,000 people over the 40 year projection period out to 2041-42, and an age distribution with a much higher proportion of young adults than in the resident population. Net migration since IGR1 was published has risen substantially, and IGR2 projects an annual rate of 110,000. Much of the increase has

[2] Even immigrant numbers are only partly determined by policy. For example, the number of foreign students coming to Australia is not controlled under current policy settings, and there is generally no restriction on New Zealanders entering and leaving Australia (subject to them meeting health and character requirements).

been among young men, and so this group has a higher weight in the IGR2 age/gender distribution than in the IGR1 distribution.[3]

We should mention that the charts we are showing you today are based on the data used in the two IGRs. Since the release of IGR2, the ABS has released new demographic data with some significant changes. One change is that the latest population estimates now include information from the 2006 Census. This reveals that Australia's estimated resident population is a little bigger and a little younger than was thought at the time of IGR2. Overall, there were 96,000 more people at 30 June 2006 than previously estimated — around 65,000 more children under 15 and 90,000 more people between 15 and 54, but 60,000 fewer people aged 55 and older.[4]

The second change relates to the introduction by the ABS of an improved methodology for calculating net overseas migration. Previously, someone coming to Australia was counted as a "migrant" and included in the resident population, rather than being treated as a short-term visitor, if they spent at least 12 consecutive months in Australia. In future, anyone in Australia for 12 months in a 16-month period is counted as a migrant. A similar change applies to people leaving Australia. The new definition will apply to published demographic data from September 2006, but the ABS has estimated that it would have raised net overseas migration by around 19,000 in 2004–05 and 29,000 in 2005–06. It would also have changed the age-and-gender distribution of migration.[5]

---

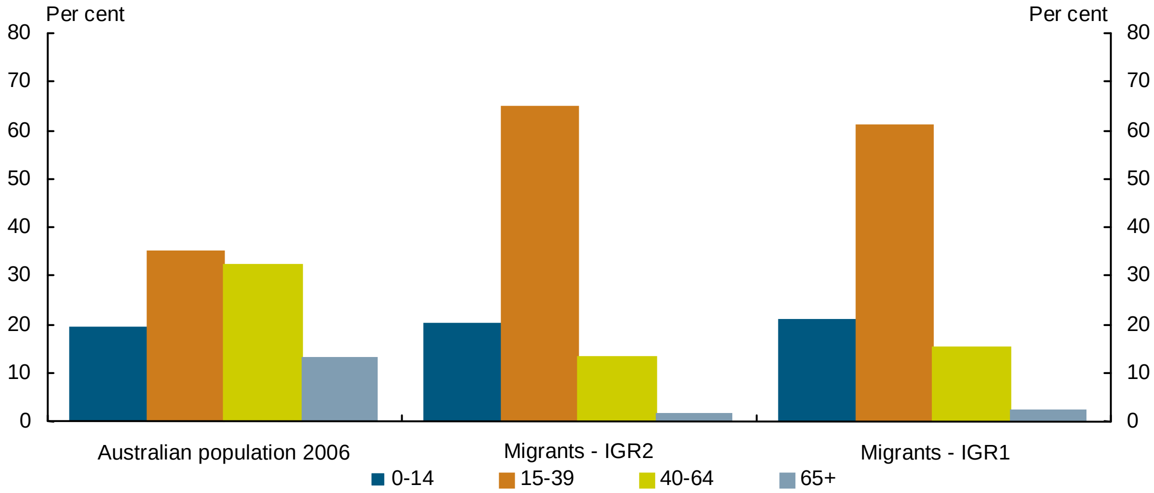
[3] Net migration numbers in IGR2 are based on a 10-year average to 2006, and the age-and-gender distribution matches the one for 2004–05.

[4] Updated estimates based on the 2006 Census are included in the December quarter 2006 issue of *Australian Demographic Statistics* (ABS cat. no. 3101.0), which was released on 5 June 2007.

[5] The current procedures for measuring net overseas migration date back to 1 July 1998, when changes were made to the information collected in the passenger cards filled in by travellers entering and leaving Australia. Time spent in Australia (or overseas) is calculated by matching incoming and outgoing passenger cards. Under the criteria adopted in 1998, people coming to Australia were classified as migrants if they remained in Australia for at least the next 12 months (the 12/12 month rule). Subsequent analysis by the ABS suggested problems with this rule, in particular in relation to the increasing numbers of overseas students and temporary long-term business migrants. Conceptually, these people are part of the resident population but, because they frequently travel overseas for short periods during the year, many were classified as short-term visitors under the 12/12 month rule. In response to the problem, the ABS introduced an interim 'migration adjustment' in late 2003, and undertook a detailed methodological review in 2004 and 2005. This review has resulted in a number of improvements in methodology, the most significant of which is the switch to the 12/16 month rule. ABS analysis suggests that the new rule correctly classifies most overseas students and long-term business migrants as residents, while still classifying backpackers and working holiday-makers as short-term visitors. Details of the changes in methodology are given in *Information Paper: Improved Methods for Estimating Net Overseas Migration, Australia*, 2006 (ABS cat. no. 3107.0.55.003). Details of the impact of the changes on estimates of net overseas migration are given in the technical note on measuring net overseas migration in *Australian Demographic Statistics*, December 2006, and *Information Paper: Statistical Implications of Improved Methods for Estimating Net Overseas Migration, Australia*, 2007 (ABS cat. no. 3107.0.55.005).

Of course, these sorts of data and methodological changes just add to the difficulties in projecting migration.

Chart 3: Age distribution of Australian population and migrants

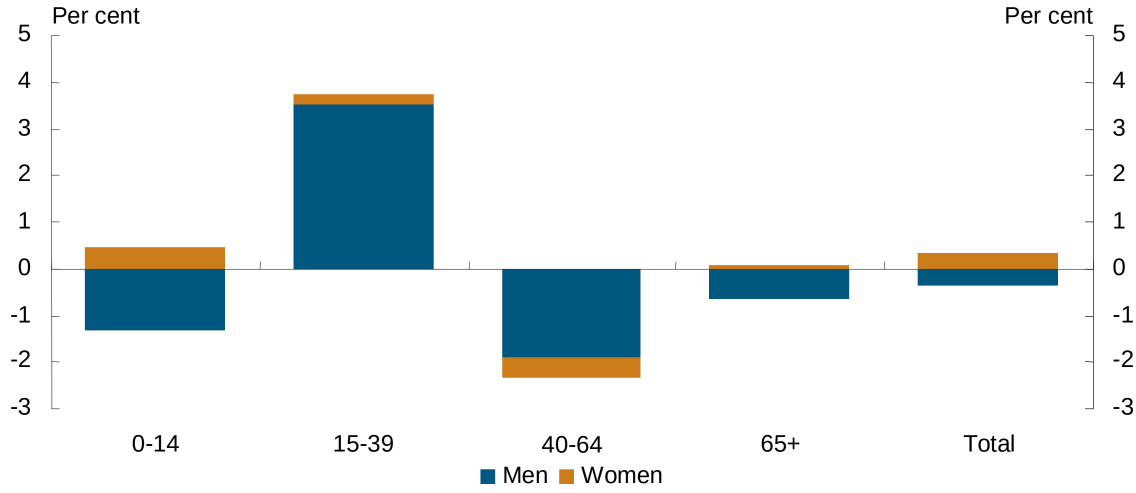


A major reason why migration is important for economic growth (and, particularly, economic growth per person) is that the age-and-gender distribution of net migration is strikingly different from the age-and-gender distribution of the resident population (Chart 3).[6] There is a much higher proportion of 15 to 39 year old young adults among migrants in the IGR2 projections (65 per cent) than in the 2006 resident population (35 per cent), and a correspondingly lower proportion of people aged 40 years and older. Also, men account for a slightly greater proportion of net migrants (just over 54 per cent) than of the resident population (just under 50 per cent).

The proportions of men and women migrants have not changed much between the IGR1 and IGR2 projections, but the proportion of young adults is higher than it was before — up from 61 per cent to 65 per cent.

[6] For ease of exposition, we will sometimes refer to “migrants” rather than the more precise “net migrants”.

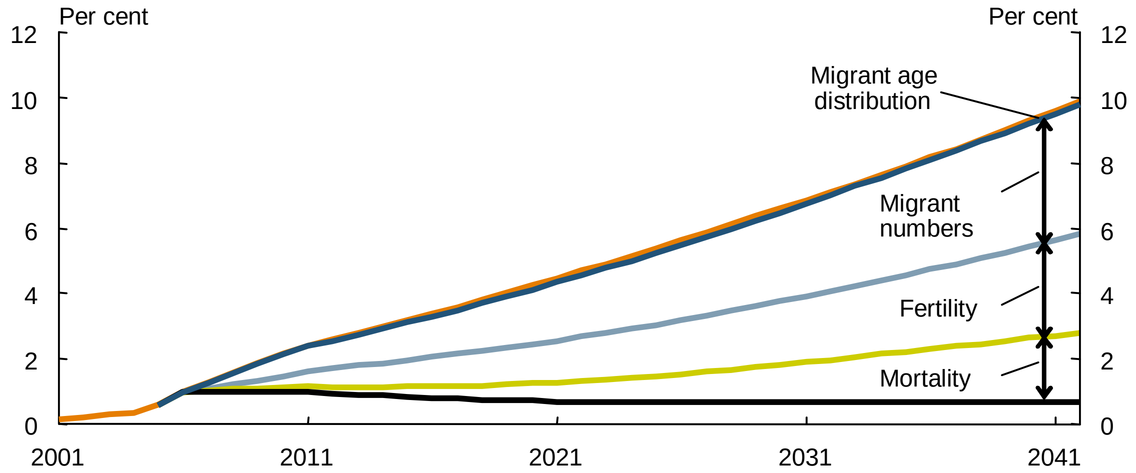
Chart 4: Change in migrant age distribution from IGR1 to IGR2



There are some more subtle changes between IGR1 and IGR2 within the migrant age/gender distribution, and these turn out to be surprisingly important. Chart 4 shows the changes in the proportions of net migrants of different ages and gender from IGR1 to IGR2. While there are only small changes in the proportions of women in each age group, the proportion of men between 15 and 39 is about 3½ percentage points higher in IGR2 than in IGR1, with correspondingly fewer boys and older men.

What are the implications of these changes for population and real GDP per person? Let's start with population.

Chart 5: Population projections: Change from IGR1 to IGR2



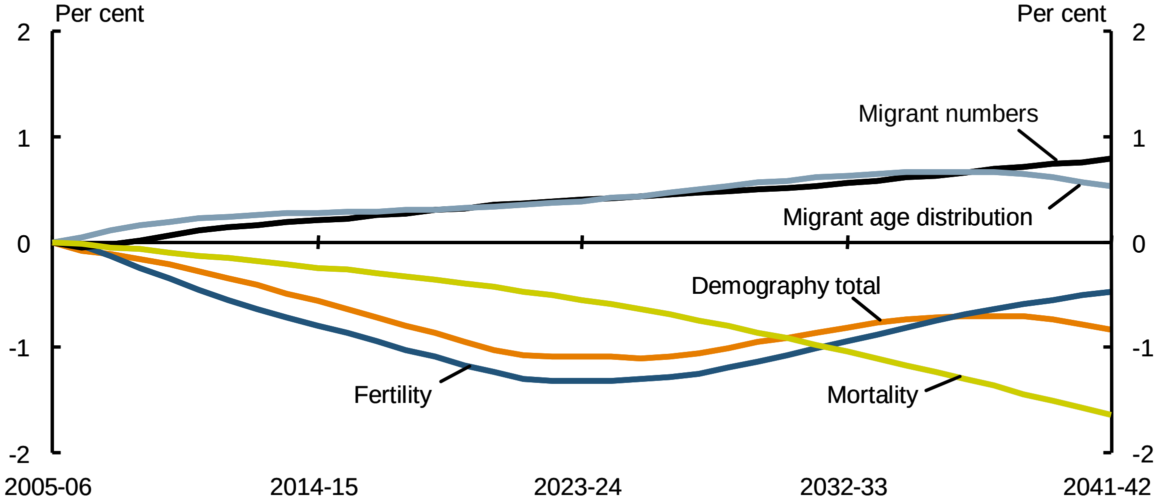
In IGR1, Australia's population was projected to grow to 25.3 million in 2042; in IGR2 it is projected to grow to 27.8 million by that date — around 2½ million or 10 per cent more. As

Chart 5 shows, some of this is due to changes that have already happened, some is due to a significantly faster increase in life expectancy than anticipated in IGR1, and some is due to a partial recovery in fertility rates.

Around 4 percentage points of the extra population, about one million people, is due to the increase in projected migrant numbers between 2006 and 2042. An extra 20,000 migrants each year for 36 years is 720,000 people. Abstracting from the small number of these extra migrants who are projected to have died over this time, the remaining ¼ million of the increase are the children the migrants are projected to have after settling in Australia. This high number reflects the large proportion of migrants who are women of child-bearing age.

While migrant numbers are important, changes in the age-and-gender distribution of migrants between IGR1 and IGR2 make little difference to population projections. Migrant women are assumed to have the same fertility rates as women in the resident population of the same age, and there is very little change in the proportion of women migrants of child-bearing age between IGR1 and IGR2.[7]

Chart 6: Demographic contributions to real GDP per person: Change from IGR1 to IGR2



[7] The number of children born in any year (current or future) is estimated in the IGR using (current or future projections of) women's age-specific fertility rates and the age distribution of the female population. This is the standard (and obvious) way to model the number of births in the population. Nevertheless, it has the implication that adding an extra young male migrant to the population leads to no extra children, whereas adding an extra young female leads to about 1.8 extra children (assuming a total fertility rate of about 1.8). Presumably, however, adding an extra young male adds somewhat to the number of child-bearing couples in the population, and hence would be expected to add somewhat to the number of children born. Needless to say, this subtlety is not modelled in the IGR.

The age-and-gender distribution is, however, important for projections of GDP per person. The implications of demographic change for GDP per person depend on whether the change affects GDP more or less than population. In the IGR framework, the impact on GDP depends on the change in hours worked (since productivity is assumed to be the same for all workers). Having a higher proportion of children or older people in the population reduces GDP per person because these groups have little or no participation in the labour force. By contrast, people aged between 20 and 54 tend to have high labour-force participation and therefore add to GDP per person.

Changes in mortality and fertility assumptions between IGR1 and IGR2 both reduce GDP per person (Chart 6). Lower mortality — which is undoubtedly looked upon favourably by those whose life spans have been extended — is not good for GDP per person because it largely raises the number of older people. Higher fertility obviously raises the number of children, who take time to reach working age and enter the labour force.

Partly, but not fully, offsetting the effects of fertility and mortality are those of migrant numbers and the migrant age distribution. If the age-and-gender distribution of migrants was the same as for the resident population, having more migrants would not change GDP per person — at least not in the IGR simulations, which assume that migrants have the same labour-force characteristics as residents of the same age and gender.[8] But a higher proportion of migrants are of working age, so the increase in projected migrant numbers between IGR1 and IGR2 raises GDP per person.

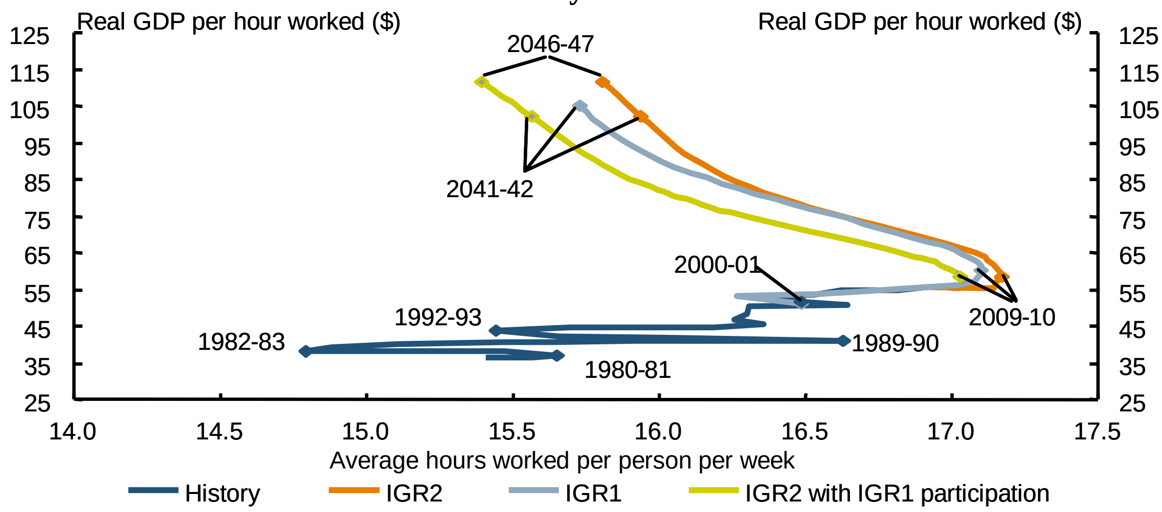
The change in the age distribution between IGR1 and IGR2 also raises GDP per person because a higher proportion of IGR2 migrants are of working age. The impact is particularly strong because the change is towards younger men (see Chart 4) — men have higher participation rates than women, so they add more to GDP on average, and they have minimal impact on population because, in the IGR modelling framework, births depend solely on the number and age distribution of women.

[8] Labour force characteristics vary across migrant categories, but skilled migrants, who make up an increasing proportion of Australia's migrant intake, are likely to have higher labour-force attachment and labour productivity than residents on average (see Hsieh and Kohler, 2007, for evidence on the high participation rates of recent migrants). However, the same is probably true of emigrants, which complicates the task of, and the data requirements involved in, distinguishing the characteristics of 'net' migrants from those of residents.

Participation

Changes in assumptions about migration between IGR1 and IGR2 lead to higher GDP per person because they increase the proportion of the population in the age groups with the highest participation rates. Since IGR1, however, there have also been unanticipated increases in participation rates for given age groups, and this is the second topic we want to discuss today.

Chart 7: Productivity and labour utilisation



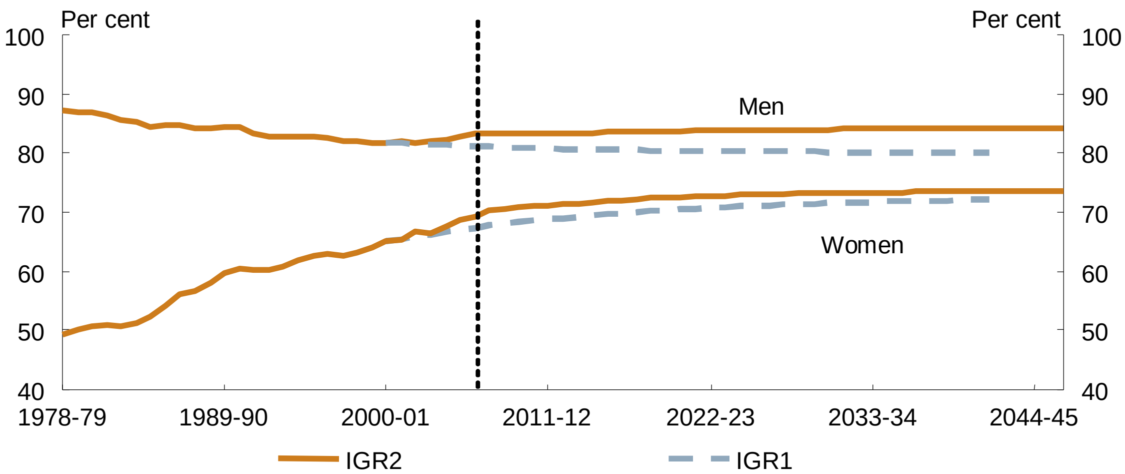
An instructive way to summarise the contributions of labour utilisation and productivity to the growth of GDP per person is in a chart like Chart 7. In the earliest versions of this chart, the time-path of labour utilisation and productivity combinations looked rather like a seahorse. The version I'm using today, from page 42 of IGR2, no longer looks much like a seahorse, but the name has stuck.

In the seahorse chart, labour productivity — that is, GDP per hour worked — is on the vertical axis. Labour utilisation — average hours worked per week — is on the horizontal axis. Note that average hours in the chart are total hours worked in the economy divided by the total population, not the number employed. So this average is affected by changes in the proportion of the population of working age, as well as by changes in the age-and-gender composition of the working-age population, and by changes in age-and-gender-specific participation rates.

Except during recessions, labour utilisation has increased over the past 30 years as the large baby-boom generation (born between 1946 and 1964) has reached working age and labour-force participation by women has risen strongly. In coming years, demographic factors will gradually reduce labour utilisation. Ageing, along with falling mortality rates, will raise the proportion of the population aged 65 and over, and the baby boomers have started to retire — the oldest of them, those born in 1946, will reach 65 in 2011. Because of this, IGR1 projected that labour utilisation would fall from the second half of this decade.

We have already seen that changes in demographic assumptions between IGR1 and IGR2 reduce GDP per person overall, despite higher levels of migration and a greater proportion of young migrants. These changes work through labour utilisation since IGR modelling does not vary productivity by the attributes of workers. If only demographic factors were at work, projected labour utilisation would have been lower in IGR2 than in IGR1, as shown by the 'IGR2 with IGR1 participation' line. But projected labour utilisation is actually higher in IGR2, largely because of rises in age-and-gender-specific participation rates, particularly among older workers.

Chart 8: Participation rates age 15–64, adjusted for demographic change



Over the past 30 years, there has been considerable variation in the movements of participation rates across age groups but, at the time of IGR1, those for men had on average been trending down and those for women had been trending up, though at a decreasing rate (Chart 8).[9] The IGR1 projections assumed those trends would broadly continue. Men's

[9] For IGR2, the participation rates for men and women shown in Chart 8 are weighted averages of the age-specific participation rates of the 10 five-year age groups from 15–19 through 60–64. Data up to 2005–06 are history; data from 2006–07 to 2046–47 are projections. For IGR1, data from 2001–02 to 2041–42 are projections calculated as weighted averages of 4 five-year age groups (15–19, 20–24, 55–59 and 59–64) and

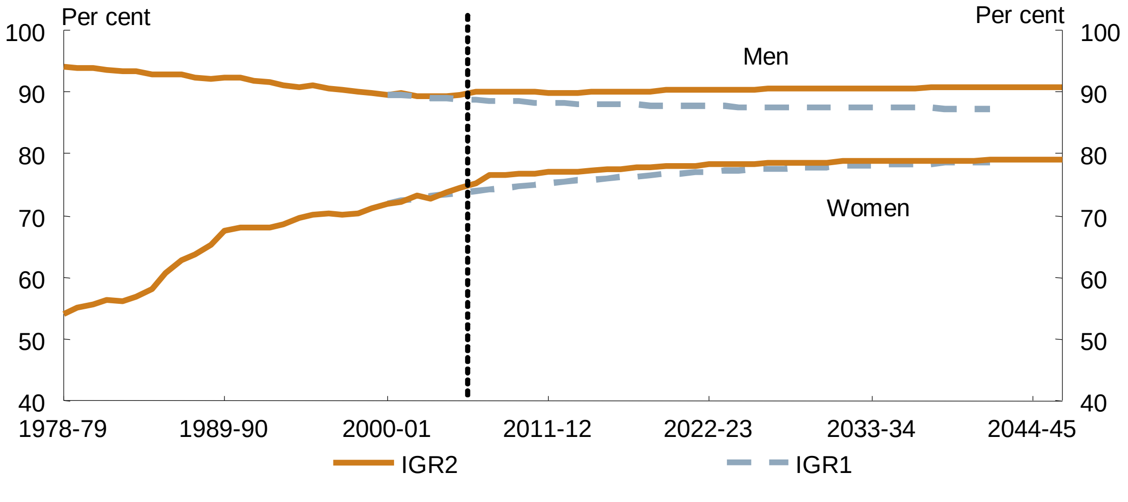
average participation rates adjusted for demographic change were projected to fall by a further 1½ percentage points and women's to rise by a further 7 percentage points between 2000–01 and 2041–42.

Subsequent experience highlights another of the challenges in making projections — trends have a nasty habit of changing. Since IGR1, the long-run downward trend in men's participation rates has been reversed — indeed men's participation rates adjusted for demographic change rose by about 1 percentage point between 2000–01 and 2005–06. Also the rate of increase of women's participation rates has picked up substantially.

Not surprisingly, these *new* trends have been incorporated in the IGR2 projections. Men's participation rates are projected to increase by a further 1½ percentage points by 2046–47, to be about 4 percentage points higher than in IGR1. Women's participation rates have been revised somewhat less. They are now projected to increase by about 5 percentage points by 2046–47, to be around 1½ percentage points higher than in IGR1. (In each case, these numbers are projections of participation rates for 15 to 64 year olds in the absence of further demographic change.)

A natural question is whether the new trends will be more robust than the previous ones. Before addressing it, however, we want to look a little closer at the changes that have been occurring.

Chart 9: Participation rates age 20–54, adjusted for demographic change

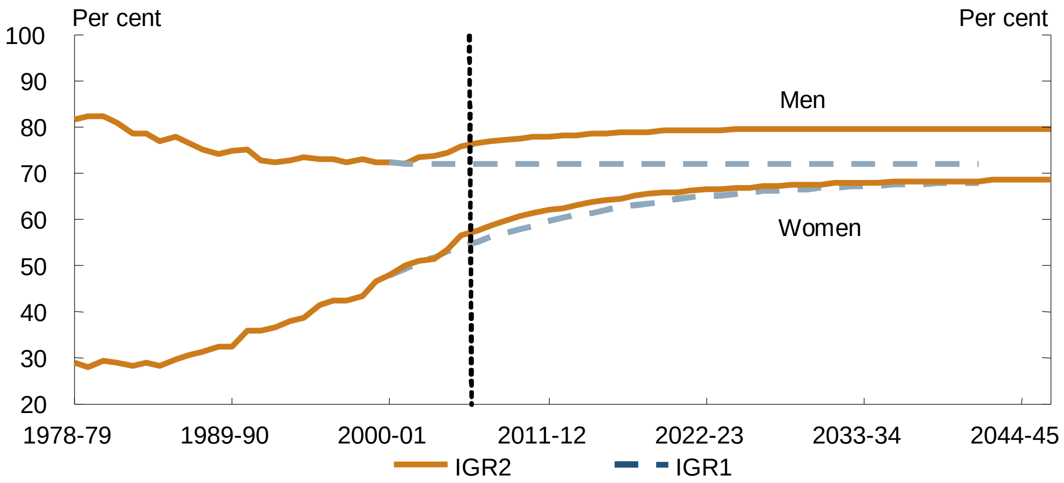


3 ten-year age groups (25–34, 35–44 and 45–54). Weights for history and both the IGR projections are based on 30 June 2006 population. IGR1 projections are rescaled to match IGR2 history in 2000–01.

The participation improvements we have seen have not been evenly distributed across age groups. Indeed, for men and women aged 20 to 54 (Chart 9) — IGR2 refers to these as 'prime-ages' — participation rates over the past five years have been only slightly higher than projected in IGR1 and projections in IGR2 differ only modestly (and indeed, much of the improvement has been due to those aged 50 to 54).[10] For men in these age groups, IGR2 projects that average participation rates will rise a little rather than fall a little. For women, IGR2 projections are noticeably stronger in the short run than those in IGR1, but only marginally so in the longer run.

The most dramatic differences between IGR1 and IGR2 (and history) are for older age groups. This starts to be true for 50 to 54 year olds, as explained above. For example, participation rates for 50–54 year old men have risen by 2 percentage points since 1996–97, reversing a long downward trend. However, this age group was not modelled separately in IGR1 (there was instead a 45–54 age group), so we can't directly compare IGR1 and IGR2 projections.

Chart 10: Participation rates age 55–59: History and projections

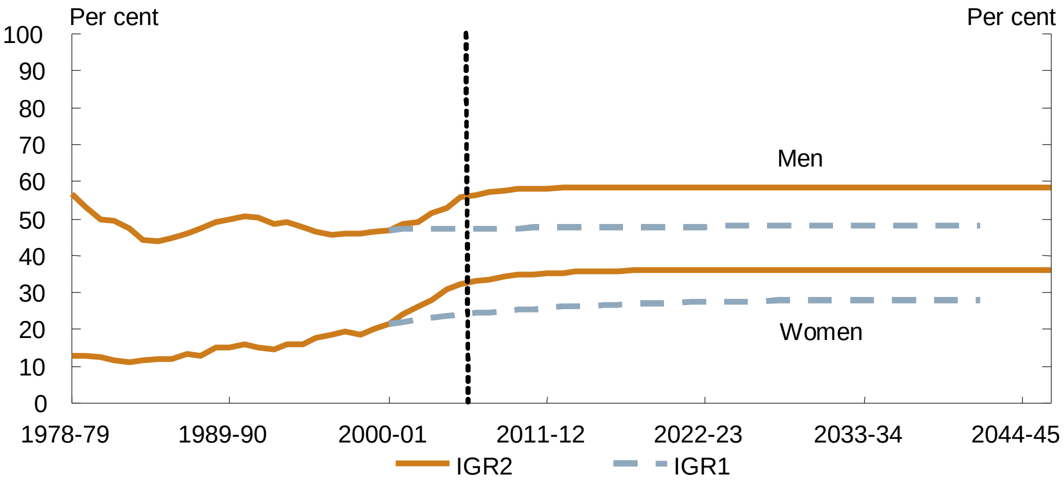


We can make a comparison for people aged 55–59 (Chart 10). For women, the picture is quite similar to the one for 'prime-age' women. Participation rates have been rising steadily since at least the mid-1980s. The rise continued over the past five years, but pretty much in line with the projections in IGR1. In IGR2, participation rates are projected to continue rising, but eventually flatten out. The IGR2 projections are stronger than those in IGR1 in the short run, but quite similar in the long run.

[10] Participation rates in Chart 9 are calculated in an analogous manner to those in Chart 8. See footnote 9 above.

For men, the story is much more dramatic. The participation rates for men aged 55–59 fell steadily in the 1980s, but were more stable in the 1990s, and IGR1 projected little change. In fact, the participation rates almost immediately turned upward and were 3½ percentage points higher in 2005–06 than in 2000–01. IGR2 projects some further increase — another 4 percentage points by 2046–47 — but to a rate that remains a little lower than in the late 1970s.

Chart 11: Participation rates age 60–64: History and projections



Comparisons are even more interesting for people aged 60–64 (Chart 11). Participation rates for women aged 60–64 were growing at a modest rate at the time of IGR1, and were projected to continue doing so. The actual increase has been quite dramatic — by more than 10 percentage points between 2000–01 and 2005–06. It seems likely than at least some of the increase has been due to changes in the qualifying age for the Age Pension, which is gradually being raised from 60 to 65.[11] This increase in the qualifying age is unlikely to be the whole story, however, since the pension age started rising well before IGR1. IGR2 projects that the participation rate for women aged 60–64 will rise further, but only by around 4 percentage points.

In history, the participation rate for men aged 60–64 has been strongly influenced by the state of the labour market. It fell in the recession at the start of 1980s and recovered in the

[11] This process began in 1995 and will be completed by 2014 — we are currently in the transition between qualifying ages 63 and 63½. A woman born on 30 June 1944 became eligible for the Age Pension when she reached 63 on 30 June 2007. A woman born the next day, on 1 July 1944, will become eligible when she reaches 63½ on 1 January 2008. For more details, see the Centrelink website: http://www.centrelink.gov.au/internet/internet.nsf/payments/qual_how_agepens.htm.

subsequent expansion (although increased entitlements to war service pensions also contributed significantly to this temporary decline – see Merrilees, 1982). It fell again in the first half of the 1990s, but was then stable for the rest of the decade. These cyclical movements make it difficult to discern longer term trends, but IGR1 projected a small increase in the participation rate. In fact, the participation rate for men aged 60–64 rose by more than 8 percentage points between 2000–01 and 2005–06, a rise only a little less than that for women. As for women, IGR2 projects further increases in the participation rate for men, and again they are quite modest — a little less than 3 percentage points by 2046–47.

To summarise, the upward trends in participation rates we have seen in recent years are mainly among older workers. So, the question of whether overall participation rates will continue to rise, at least when we adjust for demographic change, is largely a question of whether participation rates for older workers will continue to rise.

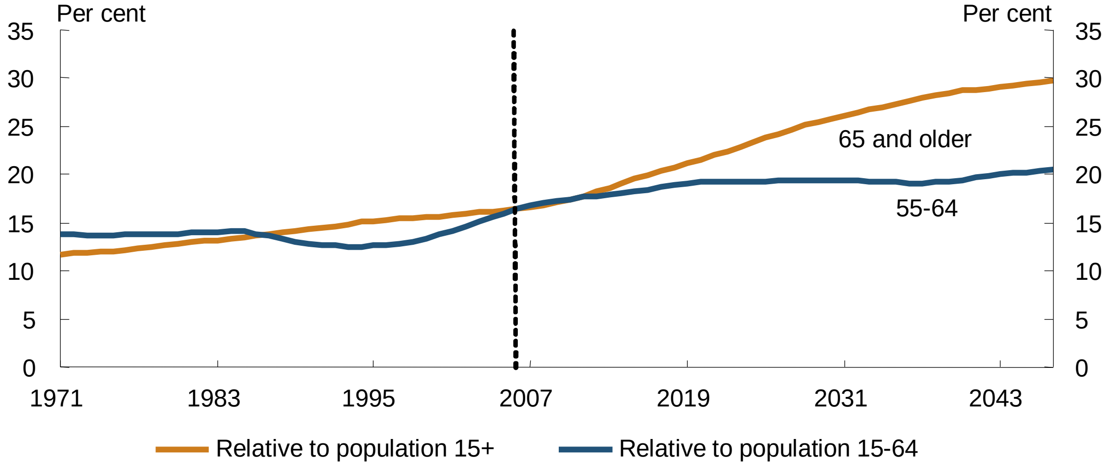
The strong labour market of recent years is likely to have played a significant role in the rising participation rates we have seen. Older workers are more likely than younger ones to drop out of the labour market when they lose jobs, so participation rates fall less with age when workers have continuity of employment. Nevertheless, there are at least three reasons to suspect that the recent increases in participation rates are not just temporary phenomena, and that the increases projected in IGR2 may be conservative.

First, rising life expectancy will encourage longer working lives, especially as more people derive a large part of their retirement income from (superannuation) savings rather than the Age Pension. Working longer allows a higher income after retirement. Of course, choosing to work longer depends on health outcomes, but longer lives seem to be associated with more years of good health.

Second, a range of government policy measures are also likely to encourage participation by older workers. We have already mentioned the rises in the qualifying age for women for the Age Pension, but a number of other policy initiatives will make staying in work, or looking for work, more attractive for both men and women. These include the Welfare to Work package, the introduction of the Mature Age Worker offset, as well as tax cuts and the recent superannuation reform.

And third, both historical and international comparisons suggest there is considerable scope for higher participation. Projected participation rates for most age groups of men are below the levels of the late 1970s, and projected rates for older men and women are not exceptional by international standards. For example, New Zealand participation rates for men age 55–64 are already around 80 per cent, considerably above the 70 per cent projected for Australia by 2046–47. For women, New Zealand participation rates are over 60 per cent, some 10 percentage points higher than projected for Australian women aged 55–64 in 2046–47.[12]

Chart 12: Working-age population proportions: History and IGR2 projections



A final point to note is that the increases in participation rates of older people are quite important for GDP projections.

The population, of course, is ageing. The proportion of people 65 and older in the population of working age — those 15 years and older — has been rising steadily, from around 12 per cent in 1971 to 16 per cent in 2006 (Chart 12). This past increase has been due largely to falling mortality rates. From the start of the 2010s, however, the rate of increase will accelerate as the baby boomers reach 65, and the proportion is projected to reach almost 30 per cent by 2047. This is the major reason for the projected fall in labour utilisation in the seahorse chart (Chart 7).

The population of traditional working age, 15-64, is also ageing, however, and it is this that makes the participation rates of older people important.

[12] See Box 2.2 on pages 24–25 of IGR2 for more details on international comparisons of participation rates of older workers. See also Kennedy and Da Costa (2006) for a more general discussion of recent trends in labour-force participation by older men.

To get a feel for what is happening, note that if there were the same number of people of each age in the population, then exactly 20 per cent of people of traditional working age (that is, aged 15–64) would be between 55 and 64. With a population growing predominantly as a consequence of above-replacement fertility, this percentage is lower — for example, in the 1970s around 14 per cent of people 15–64 were in the 55–64 age group.[13]

The proportion in the 55–64 age range started rising, however, as the baby boomers reached 55 — the oldest baby boomers reached 55 in the early 2000s. The proportion is projected to continue rising as more baby boomers reach this age range, and then to stabilise as the younger baby boomers pass 65.

Another rise in the proportion aged 55–64 is projected for the late 2030s, which will push it slightly above 20 per cent. We have not done a detailed analysis of the cause of this increase, but suspect that it reflects a bulge in the number of births in the 1980s, when baby-boomer women passed through the main child-bearing years, and is reinforced by the higher migration and increasing proportion of young adults among migrants that we are currently experiencing — a 20 year old migrant now will reach 55 in the early 2040s.

[13] The dip in the proportion in the 55–64 age range shown in Chart 12, starting in the late 1980s and continuing through the 1990s, is a long-lived echo from the Great Depression of the 1930s when birth rates were unusually low. Demography casts a long shadow.

Spending on pharmaceutical benefits

So far, we have looked at factors that affect real GDP and real GDP per person (and hence also revenue, since revenue is assumed to be a constant share of GDP in the IGR projections). The third topic we want to talk about is on the expenditure side — and it is particularly challenging.

Table 1: Projections of health spending (per cent of GDP)

	2001–02	2006–07	2041–42	2046–47
IGR1				
Total health	4.0	4.0	8.1	
Pharmaceutical Benefits Scheme	0.6	0.6	3.4	
IGR2				
Total health		3.8	6.8	7.3
Pharmaceutical Benefits Scheme		0.7	2.2	2.5

Source: Tables A1 and A2 in IGR2 and Table A1 in IGR1.

In the IGR1 projections, health spending was the fastest growing component of Australian Government expenditure — rising from 4 per cent of GDP in 2001–02 to over 8 per cent in 2041–42. A large part of this rise was due to spending on the Pharmaceutical Benefits Scheme — the PBS — under which the Australian Government subsidises a wide range of pharmaceuticals.[14] In IGR1, spending on the PBS was projected to rise from a quite small percentage of GDP in 2001–02 — 0.6 per cent — to 3.4 per cent in 2041–42. This was after allowing for a range of measures in the 2002–03 Budget designed to reduce the rate of growth of PBS spending.[15]

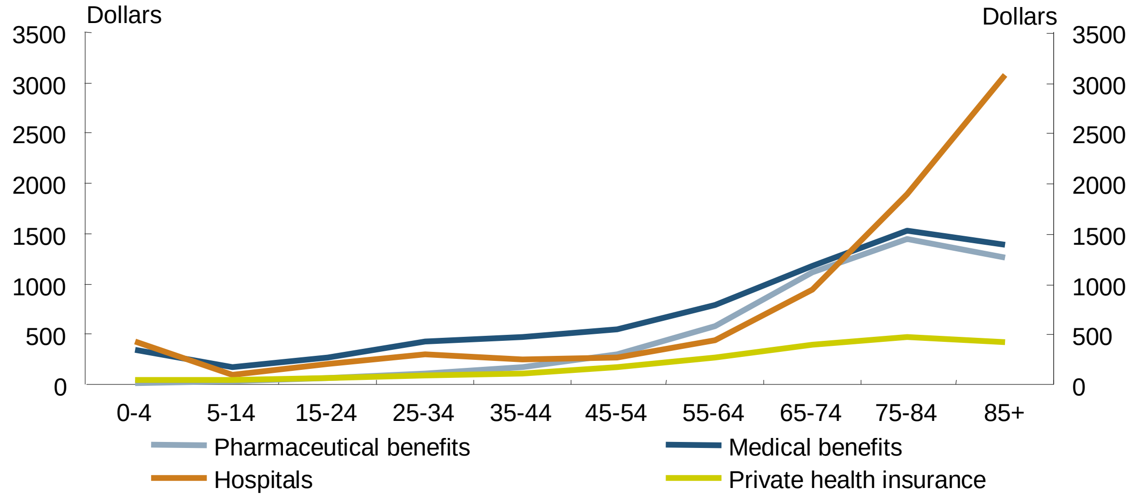
In IGR2, health spending is projected to grow to 6.8 per cent of GDP in 2041–42 — some 1.3 percentage points less than in IGR1. Most of this change is due to the PBS component, which is now projected to grow to 2.2 per cent of GDP in 2041–42. This is 1.2 percentage points less than in IGR1, but still represents a trebling of its share in GDP in the 35 years from 2006–07 to 2041–42.

[14] In IGR2 modelling, the PBS includes the Highly Specialised Drug Program and the Repatriation Pharmaceutical Benefits Scheme.

[15] These included increases in patient co-payments and safety-net thresholds and a range of other measures including ones designed to facilitate the use of less expensive generic drugs. Though introduced in the 2002–03 Budget, the legislation was not passed until 2004. The Government has recently announced further reforms that are estimated to save $3 billion over 10 years. See IGR1, page 37, and IGR2, page 51.

So, why is PBS spending projected to grow so fast? Why have estimates been reduced in IGR2? And why is projecting PBS spending so challenging?

Chart 13: Age profile of health spending per person (2005-06)

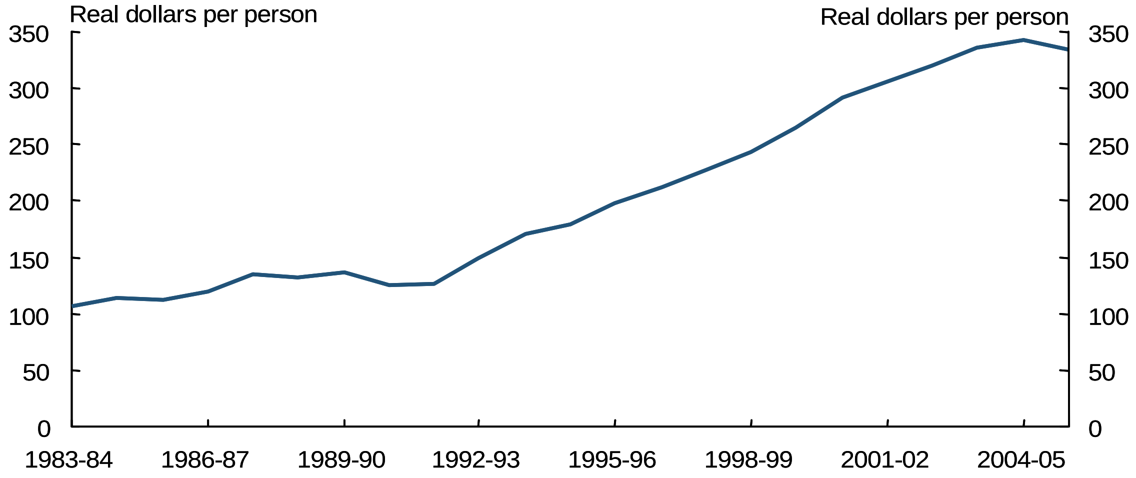


The first reason spending is likely to rise faster than GDP is demography. PBS spending, like most categories of Commonwealth health spending, is higher on average for older people (Chart 13). For example, PBS spending per person in 2005–06 averaged around $1500 for people aged 75–84, but less than $200 for people aged 35–44, and $50 or less for people under 25. With more rapid population ageing in coming years, this age profile for spending will take on increasing significance in future.

Fortunately, our population projections give us a good general idea of how the age and gender shares of the population will change over time, and this gives us a good start in projecting demographic impacts on PBS spending. There are still uncertainties, however. For example, while increasing longevity seems to be associated with better health, it is not clear whether this reduces the quantity of health spending or is, at least in part, a consequence of increased health spending.

Whatever the uncertainties about demographic factors, the second reason spending is likely to rise faster than GDP produces much greater modelling challenges. This second reason is technological change, particularly the development of new drugs. Over the past 20 years, real pharmaceutical spending per person after adjusting for demographic change has grown at an average annual rate of 6.3 per cent (Chart 14). This non-demographic increase in real spending per person is likely to continue to generate the greatest cost pressures in future.[16]

Chart 14: Pharmaceutical spending adjusted for demographic change



The trends in PBS spending illustrate a major difficulty in making projections for all types of health care. Overall health spending has been growing faster than GDP, at rates that cannot be sustained indefinitely — otherwise health spending would eventually exceed GDP. But while these high growth rates cannot be sustained indefinitely, they may well be sustained for a long time. Health spending is clearly a luxury good — that is, one for which spending rises faster than income. For example, Robert Hall and Charles Jones have modelled the relationship between health spending and life expectancy as people's incomes rise. They conclude that people's utility maximising behaviour might lead to a rise in U.S. health spending from around 15 per cent of GDP in 2000 to over 30 per cent of GDP in 2050.[17] Of course, this assumes that increased demand for health care translates to increased spending, and governments have a say in how this translation occurs.

It would be nice to use sophisticated approaches like the one of Hall and Jones to project health care spending, but these approaches are still largely in the research stage. And, of course, no conceivable modelling approach can do justice to the cost implications of technological advances that have yet to occur.

---

[16] It is worth digressing, briefly, to make the point that rising spending on health, and especially on pharmaceuticals, should not be thought of as an increase in the price of health services, but rather as an increase in the quantity of health services provided. For example, the listing of a new, more expensive, drug on the Pharmaceutical Benefits Schedule may lead to a rise in spending per person on the PBS. But, in general, this new drug provides a health service that was not previously available, or was not available with the same efficacy, and hence provides an increase in the quantity of health services, properly measured.

[17] See Hall and Jones (2004, 2007).

Fiscal projections of health care costs continue to be based on much simpler approaches — although there remains some variation in the approaches adopted. For example, the Congressional Budget Office, in projecting long-term US spending on Medicare and Medicaid, including the new "Medicare Part D" prescription drug benefit program, assumes that spending per enrolee grows at a fixed number of percentage points faster than GDP per person. The New Zealand Treasury, in its recent modelling of New Zealand's Long-Term Fiscal Position, allows for an income elasticity greater than one on health care spending, in addition to a residual growth factor. By contrast, the projections of UK health spending by HM Treasury in its Long-term Public Finance Report ignore possible non-demographic influences beyond the medium term.[18]

In IGR1, the approach adopted for PBS spending was to fit an exponential trend to actual and forecast real non-demographic spending per person from 1983–84 to 2005–06, and to assume that the average real growth rate over this period — 5.64 per cent — would continue over the remainder of the projection period.

This approach has been criticised, for example, by Ross Guest and Ian McDonald (2003), who pointed out the long-run implication mentioned above — that PBS spending would eventually overtake GDP.

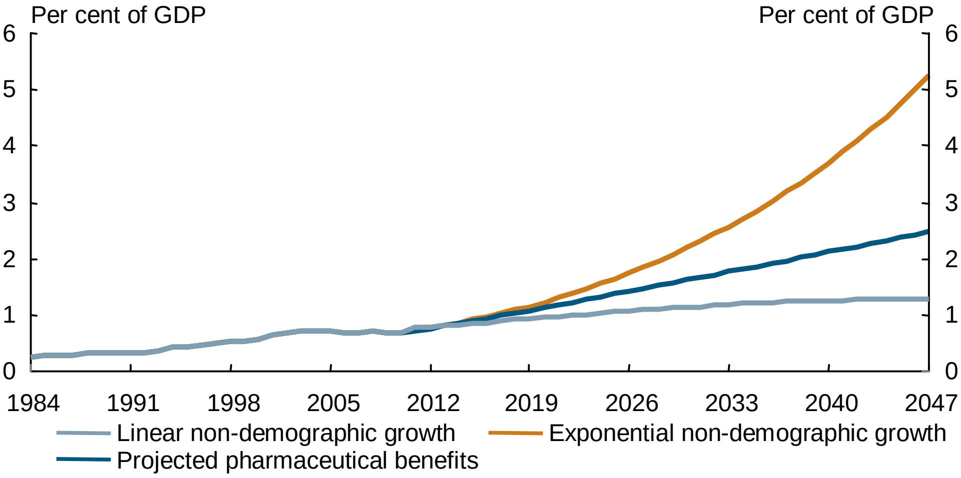
The Productivity Commission in its 2005 research report on the Economic Implications of an Ageing Australia were more concerned about the consequences for the balance between PBS spending and other health spending. This was partly because of developments since the release of IGR1 and partly because the much higher growth rate projected for PBS spending than for other health spending would imply a fundamental change in their relationship with one another. The PC also preferred to model non-demographic growth in health spending as a premium over the growth in GDP per person rather than as an absolute number.[19]

[18] CBO (2005), chapter 3; New Zealand Treasury (2006), Chapter 6 (see, in particular, pages 63–65); and HM Treasury (2006) (see, in particular, paragraphs 4.27–4.29 and 5.11, and Box 5.2)..

[19] Productivity Commission (2005). Heath spending is discussed in Chapter 6 and Appendix D. The modelling of non-demographic influences on PBS spending is explained on pages 373–375.

As a result, the PC projected PBS spending by assuming that non-demographic growth started out 4 percentage points above growth in GDP per person, a little less than the premium of 4.9 per cent in history, and gradually fell to 0.6 percentage points above growth in GDP per person, the premium for other components of health spending. The transition was captured by an 'arbitrary' logistic function.

Chart 15: Pharmaceutical spending: history and projections



The modelling of non-demographic growth in PBS spending in IGR2 starts by comparing extrapolations of history using exponential and linear trends for non-demographic real spending per person (Chart 15). As is abundantly clear from the Chart, the choice of functional form is not an innocuous one – it makes an enormous difference to projected PBS spending, especially towards the end of the projection. In 2046-47, there is a 4 per cent of GDP difference between the PBS spending projection based on exponential non-demographic growth and the one based on linear growth. Nor can history help much in deciding which approach to choose. The empirical fit of the two trends to the aggregate data is quite similar over history but, even if it were not, it is hard to have much confidence that one trend's better fit over history would provide a reliable guide to the future.

Given this state of affairs, an intermediate projection assumption was chosen, following a methodology similar to that used by the PC. IGR2 assumes that growth in PBS spending will reflect the overall growth in health spending in the long term. The non-demographic annual real growth rate per person is projected to decline gradually from 6.3 per cent (its exponential growth rate over the history shown in Charts 14 and 15) to 3.4 per cent, the growth rate for total Australian Government health spending. As in the PC modelling, the decline is captured using an ‘arbitrary’ logistic curve. The outcome is that PBS spending is projected to increase to 2½ per cent of GDP by 2046–47 — about 1¼ per cent of GDP more than would be implied by a linear non-demographic trend, but about 2¾ per cent of GDP less than implied by an exponential trend.

It would be nice to claim that the assumption we have chosen is the most realistic of the options available. However, as mentioned earlier, that will ultimately depend on the cost implications of technological advances (particularly the invention of new drugs) that have yet to occur.

Another possible response to the uncertainty inherent in the PBS projections would be to provide error bounds or confidence intervals around the preferred projection. The problem with that response is that we have no way of assigning probabilities to the various possible projection assumptions other than to make them up. If we were to do so it would, in our opinion, simply add another layer of arbitrariness to the projections, without adding much of value.

Conclusions

So, what should we conclude from this discussion of the subtleties of migration, the unexpected but welcome increases in labour-force participation, and the enigma of health-care spending projections?

It is worth keeping in mind that perhaps the most important role for long-term fiscal projections, such as those in the IGRs, is to help identify pressures that are likely to appear beyond the much shorter horizons of annual budgets, so as to be able to design appropriate responses in plenty of time. But, as the examples we have talked about show, there are substantial practical and conceptual challenges involved in making projections over such long periods of time. And, while there have been clear advances in methodology between IGR1 and IGR2, many challenges remain.

Hopefully, our comments today have whet your appetite, and will encourage you and others to join in what we are willing to forecast ultimately will be a rewarding search for answers to these challenges.

References

Congressional Budget Office: *The Long-term Budget Outlook*, *CBO*, December 2005 http://www.cbo.gov/ftpdocs/69xx/doc6982/12-15-LongTermOutlook.pdf.

Guest, Ross S. and Ian M. McDonald, "How Much Support Will The Taxpayer Provide For Us When We Are Old?" *Economic Papers* 22(1), March 2003, 1-12.

Hall, Robert E. and Charles I. Jones, "The Value of Life and the Rise in Health Spending," NBER Working Paper 10737, 2004.

Hall, Robert E. and Charles I. Jones, "The Value of Life and the Rise in Health Spending," *Quarterly Journal of Economics*, February 2007; 122(1): 39-72.

HM Treasury, *Long-term public finance report: an analysis of fiscal sustainability*, December 2006 http://www.hm-treasury.gov.uk./pre_budget_report/prebud_pbr06/assoc_docs/prebud_pbr06_adlongterm.cfm

Hsieh, Wing and Marion Kohler, "Immigration and Labour Supply", *Reserve Bank of Australia Bulletin*, September 2007, 8-13.

Kennedy, Steven and Alicia Da Costa, "Older men bounce back: the re-emergence of older male workers", *Economic Roundup*, Spring 2006, 31–44.

Merrilees, W.J., "The Mass Exodus of Older Males from the Labour Force: An Exploratory Analysis", *Australian Bulletin of Labour*, 8(2), 1982, 81-94.

New Zealand Treasury, *New Zealand's Long-Term Fiscal Position*, June 2006 http://treasury.govt.nz/longtermfiscalposition/2006/.

Productivity Commission, 2005, *Economic Implications of an Ageing Australia*, Productivity Commission, Canberra. www.pc.gov.au/study/ageing/index.html.