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### Population ageing and higher net migration: implications for Australian long-term demographic and economic projections

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#### 1. Introduction

Long-term projections provide policy makers with an important tool for understanding the implications of long-term strategic challenges such as ageing populations, climate change or structural changes in the international economy. Consequently, in the last decade many governments have started to produce regular reports on their long-term economic or fiscal outlook. The Australian government released the first Intergenerational Report (IGR1) in May 2002 as part of the 2002-03 Australian government budget; the second report (IGR2) was published in April 2007. A selection of countries that produce such reports is listed in Table 1.

**Table 1: Summary of selected reports on long-term economic or fiscal projections**

Author	Report title	Projection period	Frequency	Most recent
Australian Treasury	Intergenerational Report	40 years	5 years	2007
HM Treasury	Long-term public finance report	50 years	Annual	2008
NZ Treasury	New Zealand's long-term fiscal position	40 years	4 years	2006
US Congressional Budget Office	The long-term budget outlook	75 years	2 years	2007
German Ministry of Finance	Report on the sustainability of public finances	45 years	n/a	2005
European Commission	The long-term sustainability of public finances in the European Union	45 years	2 years	2006

One long-term strategic challenge that has received much attention in recent years is the prospect of population ageing (that is, an increase in the proportion of elderly people relative to the working age population). Australia's population is ageing because, as in many other countries, Australian life expectancy has continued to improve significantly since the early 1900s, while fertility has remained below the levels of the 1950s and early 1960s.

Increased life expectancy is a welcome trend that should be celebrated. Nonetheless, population ageing poses substantial challenges for economic growth and long-term fiscal sustainability. Since Australia's population will have proportionately fewer people of labour force age, economic growth (that is, growth in real GDP per person) is projected to rise more slowly in future decades than it has over the past 40 years. Furthermore, higher aged and total dependency ratios are likely to lead to

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increased government expenditures without corresponding increases in revenue, thereby creating an expanding ‘fiscal gap’.<sup>2</sup>

There is continuing debate both within Australia and internationally about the possibility that increased migration could ameliorate the economic and fiscal impact of population ageing. Demographically, any realistic level of migration will only have a small impact on the changing structure of Australia’s future population because although new migrants are younger, on average, than the resident population, (permanent) migrants will themselves continue to age. Therefore, rapidly increasing immigration levels would be required to maintain Australia’s current age structure. In other words, population ageing is unavoidable and the most that can be expected is that migration may somewhat mitigate this process. Nonetheless, this mitigating effect may be sufficient to induce important economic and fiscal outcomes.

The economic impacts of migration are varied and complex. At an aggregate level, net migration will lead to changes in both aggregate supply and aggregate demand. Flows of immigrants and emigrants affect supply by altering the stock of factors of production (principally labour and human and physical capital) and perhaps also by altering multi-factor productivity (for example, through economies of scale or environmental externalities). Net migration also impacts on aggregate demand by stimulating consumption and investment. The extent to which these different effects manifest themselves will depend on the characteristics of the immigrant and emigrant populations (including demographic, educational and labour force characteristics, the length of stay/departure and where migrants choose to reside) and also state of the economy (both at an aggregate and a sectoral level). These variables will also influence how the impact of migration is distributed between: residents and immigrants, different regions, low-skilled and high-skilled workers and so on.

The net impact of these various effects can be determined through general equilibrium analysis, typically through the use of computable general equilibrium (CGE) models. The aim of this paper, however, is to study the possibility that migration can mitigate the effects of population ageing by drawing on the long-term projection methodology developed for Australia’s Intergenerational Reports. Consequently, we focus on the demographic impact of higher migration and the resulting changes in one key component of the broader economic story – increases in labour force participation. We then consider how these changes might flow through to long-term outcomes for GDP and GDP per capita. We also extrapolate from existing results in IGR2 to consider the potential fiscal implications of higher migration.

We apply the IGR2 methodology to a ‘high migration scenario’ in which net migration is sustained at a constant level of 150,000 people per annum (compared to a base case of 110,000 in IGR2). We find that, in 40 years time, higher migration would result in a population that is 7.1 per cent larger and a dependency ratio that, although higher, will increase by noticeably less than the IGR2 baseline. The migration levels projected in IGR2 led to projections that the labour force would continue to grow over the projection period however we find that higher migration leads to significantly stronger projected labour force growth. The high migration scenario produces a labour force that is 8.6 per cent larger in 2046-47 than the IGR2 projection. This has a flow-on impact for growth in GDP and GDP per capita. Our projections suggest that by 2046-47, real GDP may be 8.7 per cent higher under the ‘high migration scenario’ and that GDP per capita may also increase,

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<sup>2</sup> The main spending pressures are in health, age pensions and aged care. These areas are all affected by demographic change but health spending is also projected to increase due to non-demographic factors such as the development of new pharmaceuticals and improvements in medical technology. See IGR2 (pp.46-61) for further details.

albeit more modestly (1.5 per cent). Finally, we argue that higher migration would be expected to result in a modestly stronger long-term fiscal position.

The remainder of this paper is structured as follows. The broader context for this paper is provided in Section 2 (which summarises the broad process of demographic transition and places Australia's population ageing in that context) and Section 3 (which surveys the possible economic impacts of migration). The data and methodology underpinning our study is then outlined in Section 4 (which summarises recent trends in net migration to Australia and motivates our high migration scenario) and Section 5 (which provides an overview of the methodology and key assumptions used in IGR2 and in this paper). Section 6 then details the results of our 'high migration scenario' and Section 7 discusses the possible fiscal implications of higher net migration. Section 8 concludes.

## **2. The demographic transition and Australia's ageing population**

### *The demographic transition*

Two centuries ago, changing trends in fertility and mortality marked the beginning of a demographic transition that 'has now spread to all parts of the world and is projected to be completed by 2100' (Lee 2003, p.167). Typically, this transition comprises three stages commencing with a decline youth mortality and a relative increase in the youth population followed by a fall in fertility and relative increase in the working age population and concluding with a decline in aged mortality and a relative increase in the aged population.

The demographic transition provides a valuable backdrop for understanding the phenomenon of population ageing. It is described in more detail below, based on a recent account by Ronald Lee (2003), who notes that:

The patterns of change in fertility, mortality and [population] growth rates over the demographic transition are widely know and understood. Less well understood are the systematic changes in age distribution that are an integral part of the demographic transition and continue even after the fertility and mortality rates have stabilized. (Lee 2003, p.180)

In the first stage of the demographic transition, mortality declines mainly amongst younger age groups. This increases the proportion of children in the population and increases child dependency ratios (that is, the ratio of children aged under 15 to the 'working age population' aged 15-64). These initial mortality declines make populations younger rather than older. This phase of the transition can last many decades.

Subsequently, declining fertility leads to a fall in child dependency ratios. As a result, the working-age population will, for a number of decades, grow faster than the population as a whole. Lee (2003, p.182) notes that whilst some have argued that this phase of rapid labour force growth might lead to rising unemployment and falling capital-to-labour ratios, others stress the 'demographic bonus' (that we refer to hereafter as the 'demographic sweet spot') that results from a relatively high proportion of the population being of labour force age.<sup>3</sup>

The third part of the demographic transition – population ageing – occurs as increasing longevity, especially at older ages, leads to a rapid increase in the older population. Growth in working age

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<sup>3</sup> This is only a 'sweet spot', of course, if the economy is capable of utilising most or all of these potential workers.

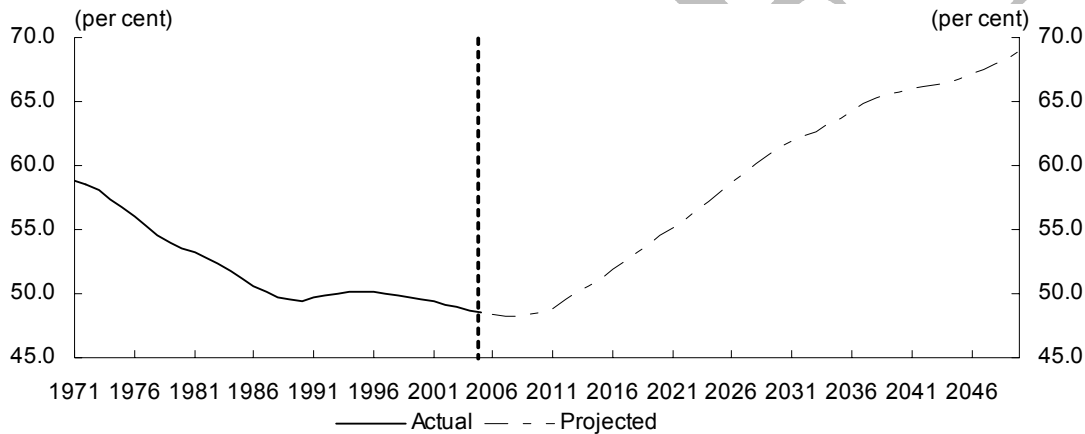
population slows due to declining fertility. Old-age dependency ratios (that is, the ratio of people aged 65 and over to the working age population) can rise quite rapidly in this phase.

By the end of the transition process, the total dependency ratio may be similar to the level prior to the transition, albeit with a different composition: child dependency rates will be much lower whilst old-age dependency rates will be much higher. Lee (2003, p.183) states that no country in the world has yet completed this phase of population ageing however a number of countries have already moved out of the ‘sweet spot’ and their populations are projected to age very rapidly over coming decades.

*The Australian case – the demographic sweet spot and population ageing*

Australia is currently nearing the end of phase two of the demographic transition, the ‘demographic sweet spot’. Australia is benefiting from growth in the working age population relative to the total which has caused the total dependency ratio to reach an historic low (Chart 1). This, along with other factors, has resulted in a gradual increase in the total labour force participation rate, from 60.7 per cent in 1978-79 to 64.5 per cent in 2005-06 (IGR2, p.19), which in turn has generated higher levels of economic output.

**Chart 1: Total dependency ratio in Australia, 1971 to 2005**



**Source:** Treasury calculations (based on ABS cat. no. 3101.0, Table 9 as at June 2006) and projections  
**Note:** The ‘dependent population’ comprises those aged less than 15 years and those aged 65 or more.

This ‘sweet spot’ is a positive demographic outcome resulting from the decline in fertility from the relatively high rates of the post-World War II baby boom years – fertility peaked in 1961 at 3.5 births per woman. Over the course of the next decade, this sweet spot will come to an end and Australia will experience the onset of population ageing (the third phase of the demographic transition). As increasing proportions of the population reach retirement age, dependency ratios will increase. As a result, the IGR2 projected that the total labour force participation rate will decline from 64.5 per cent in 2005-06 to 57.1 per cent in 2046-47 (IGR2, pp.19-20). It is the resulting impact on economic activity and government revenues and expenditures that constitutes the challenge of managing population ageing.

Whilst the demographic sweet spot was a product of the decline in fertility since the baby boom period, it is not the baby boomers phenomenon that is driving population ageing. Instead, this process is the combined effect of steady improvements in life expectancy whilst fertility rates have remained below the levels of the 1950s and early 1960s. Even if there had not been any baby boom, these two trends would have guaranteed population ageing in Australia. In fact, without the baby boomers, population ageing would have occurred sooner than is the case although the transition would not have been so sudden. In other words, the importance of the baby boomer

phenomenon is its impact on the *onset* of population ageing: it has delayed the onset but also ensure that once it commences, it will occur more rapidly. See Productivity Commission (2005, pp.6-32) for a detailed discussion of this point.

### 3. The economic impact of migration

It is generally accepted that whilst realistic increases in migration levels could retard the process of population ageing, this retarding effect will be small relative to the overall change in the long-term age structure of the Australian population.<sup>4</sup> In Section 6, we present results that provide further confirmation of this view. However, small changes in the overall demographic structure may still lead to important economic and fiscal effects. This section discusses the possible impacts of net migration on the economy as measured by GDP and GDP per capita; the discussion draws heavily on the Productivity Commission's 2006 report *Economic Impacts of Migration and Population Growth*.<sup>5</sup>

The economic impact of migration is hard to determine both because it depends on a range of variables (composition of the immigrant and emigrant populations and the prevailing state of the local economy) and because it is theoretically complex (it affects the economy in many ways).

The composition of the immigrant and emigrant populations can vary greatly.<sup>6</sup> Their economic impact may depend on, amongst other things, their demographic characteristics (age and gender), their education and labour force characteristics (education, work experience, occupation type), their general skills (language skills, motivation, entrepreneurship etc), where they choose live and finally, whether their stay (or departure) is temporary and, if so, for how long.

The state of the local economy also matters. The impact of migration may be very different depending on the aggregate economic conditions (for example, whether the economy is near 'full capacity' or is underutilised) and sectoral economic conditions (for example, the presence of market rigidities or flexibility that delay or enhance the economy's capacity to adjust to structural changes).

These many variables give some indication of the numerous interactions between net migration and the economy. As the Productivity Commission (2006, p.152) states:

Migration flows influence the rate of population growth, the age distribution of population, labour supply (by region, occupation, industry and skill level), consumption, savings, new investment, imports and exports, the balance of trade, the terms of trade, government revenue and expenditure, the size of the economy, use of natural resources and land, and a number of other factors. Together, these factors influence productivity and income per capita.

It is not surprising then that the related economic theory is also complex. It is helpful to start by noting that, at the aggregate level, migrants contribute both to both aggregate supply and aggregate

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<sup>4</sup> For further discussion, see Betts (1998), McDonald and Kippen (1999), Withers (2002) and Productivity Commission (2005, pp.32-41).

<sup>5</sup> Migration is likely to have an additional impact on GNP per capita through its affect in net foreign income (ie, investments in foreign companies and associated returns on those investments and overseas remittances). Also, this discussion does not attempt to address the well-recognised limitations of either GDP or GNP as measures of welfare (Productivity Commission 2006, pp.32-33). Finally, this discussion so does not address the possible social or cultural impacts of migration, even though these may have flow-on economic impacts.

<sup>6</sup> Hereafter, the discussion will focus on immigrants; equivalent arguments apply in reverse to emigrants.

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demand and consequently, their net impact is a combination of these two effects in general equilibrium.

Aggregate supply is determined by factors of production (such as labour, physical capital, human capital and natural resources) and the effectiveness with which these factors are combined (that is, multi-factor productivity, MFP). Migrants may add to the supply of several production factors. Increased net migration generally leads to an increase in labour force participation because typically, migrants are disproportionately of working age. In addition, some migration programs like Australia's are targeted at 'skilled migrants', amongst others, in order to attract migrants with higher levels of 'human capital' (education, work experience and other skills valued by the labour market).<sup>7</sup> Furthermore, migrants may also invest their accumulated savings in local businesses, thereby increasing the domestic capital stock.

Migration may also boost MFP however, despite MFP's key role as a driver of sustainable long-run economic growth, its possible link with migration is not well understood. One possibility is that migration can create economies of scale through a larger population and economy. The Productivity Commission (2006, pp.41-42, 100-110) surveys a range of areas that may be susceptible to economies of scale (and also diseconomies of scale) but concludes that the existing body of research on the issue is inconclusive (see also Garnaut 2003, pp.13-18). A second possibility is that migrants improve productivity by strengthening links with international markets or by bringing new ideas for production, management, technological advancement or other forms of innovation. By contrast, migration may act as a drag on productivity by increasing negative environmental externalities (Productivity Commission 2006, pp.110-122).

Migrants also affect aggregate demand through their consumption of domestic goods, imports and government services and through any investments they make. Thus, just as migration may boost the supply potential of the economy, it also stimulates economic demand. The net impact of migration occurs in general equilibrium and, in principle, can be estimated by computable general equilibrium (CGE) models. In addition, CGE models can take some account of sectoral effects (discussed below) and also the feedback effects that occur in general equilibrium (such as increased capital accumulation in response to increased labour supply, changes in foreign investment and movements in the terms of trade).

The sectoral effects of migration are important because the aggregate impacts on supply and demand will not apply uniformly across the economy. As noted above, which areas are most greatly affected (and whether they are affected positively or negatively) depends on the characteristics of the immigrant and emigrant populations and also the state of the economy. Some industries that are acutely affected by labour shortages may benefit disproportionately. Some regions may receive a disproportionate number of migrants and so the impact either on the labour market or demand stimulus may be more pronounced. For example, it is possible that migration may lead to a strong increase in housing demand in some regions (either rental housing, in the case of temporary migrants, or housing purchases, in the case of some permanent migrants).

The Productivity Commission (2006) commissioned the Centre of Population Studies (CoPS) to use its CGE model (the MONASH model) to study the impact of a 50 per cent increase in skilled migration on the Australian economy. They noted the limitations inherent in such models:

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<sup>7</sup> However, Birrell and Healy (2008) argue that Australia's skilled migration program may not be as effective in addressing skill shortages as intended because the majority of skilled migrants come from non-English speaking