2 The determinants of Australia's future demography

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2.1 Uncertainty and the appropriate future time reference

The proximate or immediate determinants of Australia's demographic future are its present population and its age structure, future births and deaths and future immigration and emigration. While the present population and its age structure are given, the future pathways of the other proximate determinants are by no means certain because they will be influenced by future economic, social and environmental factors that are inherently unknowable. This is especially the case in the longer term, where the longer term is defined as more than 10 years into the future. For example, how could we predict fertility in the 2040s when the potential mothers of the 2040s are not yet born? Given that net overseas migration is very largely a function of the demand for and supply of labour in Australia, how could we predict migration in the 2040s when we have no idea what labour demand will be at that time?

There is also great controversy in demography as to whether life expectancy will continue rising at an almost constant rate or whether the rate of its rise will slow down considerably. We have little capacity to predict expectation of life in 2050, but any errors that we may make in projecting mortality will primarily affect only the numbers aged 75 years and over, but there the effect is large.

As an example of demographic uncertainty, the National Population Inquiry conducted in the first part of the 1970s did not foresee the ageing of the Australian population that became a central policy issue from the 1980s onwards. This was because the inquiry, which reported in 1975, overestimated future fertility and mortality. Not long after the inquiry had reported, the ageing issue was created by

sharp falls in both fertility and mortality that had not been projected by the inquiry (McDonald and Kippen 1999).

A more recent example is provided by the course of fertility in the past decade. In 2003, both the Department of the Treasury in its *Intergenerational Report* and the Australian Bureau of Statistics (ABS) made projections of Australia's population that assumed that Australia's fertility would continue the trajectory of its fall during the 1990s. Instead, the Australian fertility rate rose sharply after 2003. In the six years from 2004 to 2009, there were 152 000 more births in Australia than had been projected in the 2003 ABS population projections. This error is equivalent to over 250 primary schools, each with 600 students, or 8000–10 000 primary school teachers.

The lesson to be learned from these two examples is that demographic futures can differ from those projected by official agencies even in a relatively short period. In this paper, I argue that better methods for projecting fertility and migration over a decade or so are possible and that Australia should direct resources towards these superior methodologies. However, beyond the next decade, the trends become more speculative, and exponentially so as time progresses. The projected population of Australia in 2050 is effectively a hypothetical number, yet it is this number that has stirred passionate debate in Australia over the past 12 months. Directing such passion at the inherently unknowable has proven to be exceptionally unproductive because it has shifted attention away from careful consideration of the much more predictable population growth in the next decade (to 2020) and the somewhat less predictable growth in the following decade (2020–30).

While it is true that we can predict the percentage of the population that will be aged 65 years and over in 2050 within four or five percentage points of accuracy, we have a long time to plan for ageing by 2050. Ageing by 2050 is the central issue in the Government's *Intergenerational Reports*, but it is not what is exciting the current popular debate about population. The current popular debate, quite correctly, is centred upon the capacity to manage Australia's present population and its population over the next 20 years in terms of the balance between the economy, the environment and lifestyle. Central to the debate are the future demand for labour and the adequacy of infrastructure in Australia.

2.2 Future fertility

The 2003 *Intergenerational Report* focused its attention on the long-term impacts of ageing on the federal budget. It is arguable that the unpredicted short-term impacts arising from the immediate failure to project births accurately will prove to have been much more important. Australia failed to plan for the substantially increased demand for pre-natal and maternity services, child care and early childhood education, and primary schools. These are 'lumpy' services that are not easily geared up. There was also a large increase in the family payments line of the budget.

In most advanced countries over the past 50 years, statistical agencies have performed poorly in estimating the future number of births. Australia is not alone. In the short term (ten years or so), this has been due primarily to poor methodology, not to unforeseen social change. In the long term, births are inherently unpredictable.

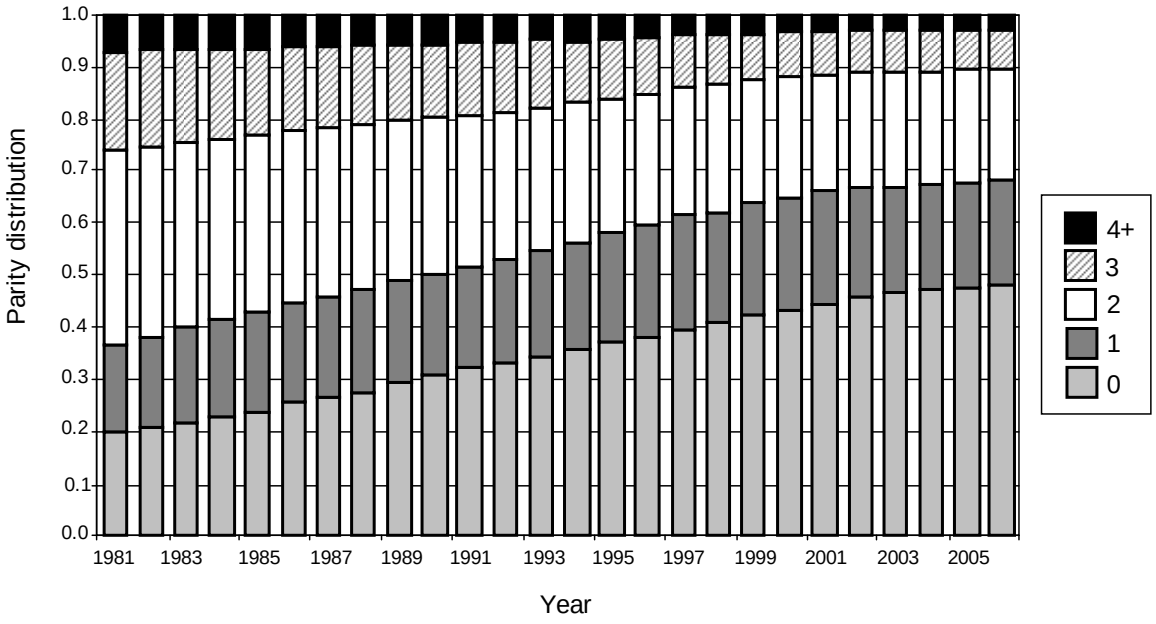
The conventional method used for the projection of births employs just one parameter as a predictor of the likelihood that a woman will give birth: her age. Rates of birth at each age are 'projected' into the future, and those projected age-specific rates are then applied to the estimated future numbers of women at each age to calculate the future number of births. Generally, the future level of age-specific birthrates is projected from past trends, or the opinions of experts are obtained. Much of this estimation revolves around (guesstimates of) the future course of a single summary measure, the total fertility rate, which is the sum of the age-specific fertility rates in a given year. The total fertility rate is the conventional 'headline' measure of a country's fertility.

In the long term, the total fertility rate is affected by attitudes and values and changes in the socioeconomic characteristics of the population. In the short term, it can be affected by macro-economic trends, but when fertility is low (as in Australia) those effects are likely to be small. The major influences on annual rates of fertility in the short term are changes in the *timing* of first births (including the effects of past changes) and the flow-on effects to higher order births. Demographers refer to fluctuations in the annual total fertility rate due to birth timing changes as 'tempo effects'.

Since World War II, annual fertility rates in Australia have been affected by two tempo effects. The first was a shift to much earlier childbearing, which lasted until the early 1970s. This produced the postwar baby boom, and two-thirds of the boom was due to changes in the timing of births, not to increases in the number of births that women were having across their lifetimes. From the mid-1970s the opposite

trend has been in operation, in that women have been having their first births at later and later ages without that having much effect on the number of births that they have across their lifetimes. The percentage of women who had had a first birth by age 27 fell by around 37 percentage points from the 1950 birth cohort to the 1979 birth cohort; however, as yet, the percentage having a first birth by age 45 across birth cohorts from 1950 onwards has fallen by only 4 percentage points. Thus, for many years in Australia, the annual rate of fertility has been low because first births have been delayed. Figure 2.1 shows that, by age 30, the parity distribution of Australian women has stabilised in recent years; that is, the long-term trend towards increasingly older childbearing has ceased.

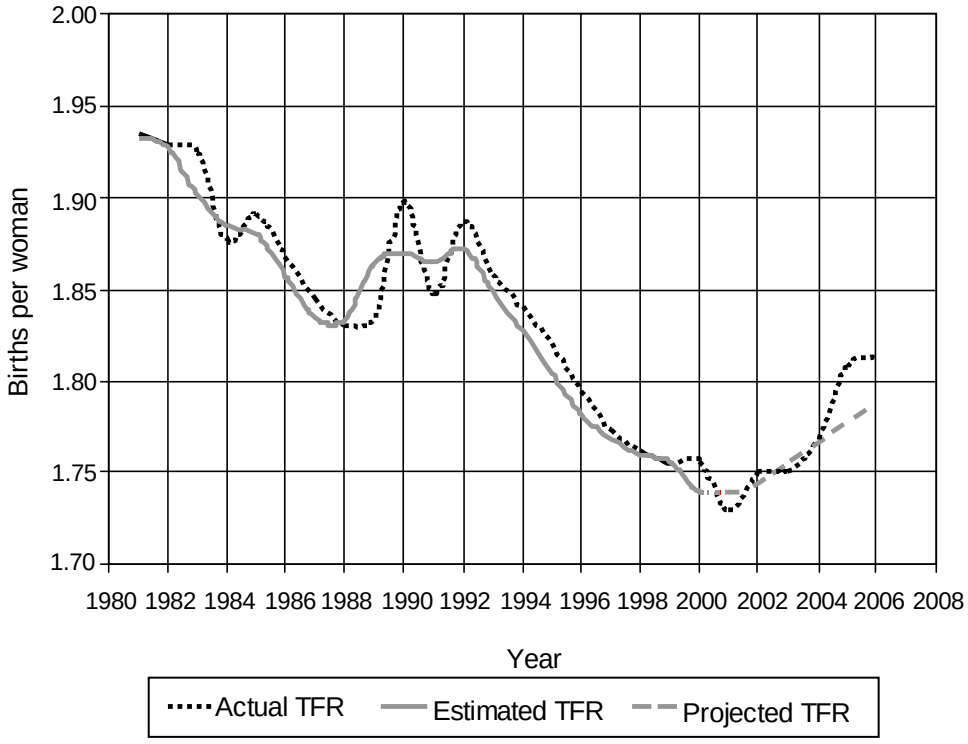
Figure 2.1 **The distribution of the number of children ever born to women reaching age 30 in a given year, 1981 to 2006, Australia**



All the evidence points to the rise in annual fertility since 2001 being due very largely to the cessation of further delay of first births and to women at older ages having the births that were deferred from earlier times. Was this change in the direction of annual fertility predictable? The answer is that it was predictable using more parameters than are conventionally used. A woman's age is not a great predictor of whether she will give birth in a particular year. However, if she has already had her first birth, her age together with the number of births that she has had already and the time since the previous birth are excellent predictors of the likelihood and timing of her next birth. This is especially the case when the birth rate is low.

Using these observations, McDonald and Kippen (forthcoming) have devised a method to forecast births that simultaneously uses three characteristics of the woman: age, parity and duration since the previous birth. The method also takes account of the structure of the population by those three characteristics. The effectiveness of this method for predicting births beyond the first birth is extremely high. We need then only a method to predict first births. Figure 2.2 demonstrates the effectiveness of this method in a projection of births from 2001 to 2006. The method was successful in projecting a turning point in the trend of the total fertility rate. If this method had been used in 2003, the rise in births that has been experienced would have been predicted.

Figure 2.2 **Actual and projected total fertility rates (McDonald-Kippen projection approach)**



In policy terms, to the extent that fertility is influenced by policy, Australia should attempt to support a birthrate of around 1.8–1.9 births per woman. All of the 30–40 countries that have birthrates below 1.5 births per woman consider that their birthrates are too low. All report to the United Nations that they prefer to see the rate rise. Many are actively pursuing policies to increase their birthrates. Very low birthrates must be avoided because they lead to large distortions in the age structure of the population and to severe future falls in labour supply. This means that Australia should continue to provide supports to families with children. Calls for more severe income testing of family payments fly in the face of the policy

direction of almost every advanced (OECD) country. With the availability of paid parental leave, abolition or more severe income-testing of the baby bonus would create a huge inequity between mothers eligible for paid parental leave and those who are not.

2.3 Future mortality

A relatively high degree of certainty applies to the projection of deaths in the next 10–20 years. Today, the proportion of people dying in the next two years does not exceed 10 per cent until after age 80. Under age 80, errors in the projected number of deaths will have very little impact on the projected population numbers. Errors in the projected levels of mortality will only affect the population aged 80 and over. There is much more dispute about the future path of mortality in the long term.

2.4 The path of natural increase

The balance of births over deaths, or natural increase, is affected by the level of migration. If the total fertility rate is assumed to remain constant at 1.9 births per woman and mortality follows its current trajectory, in 2019 the level of natural increase would be 85 000 if net migration averages zero from 2009 onwards and 127 000 if net migration over the same period averages 180 000. By 2029, natural increase would be 32 000 under the zero migration assumption but 95 000 under the 180 000 migration assumption. Put another way, the total population increase in 2029 would be 32 000 if net overseas migration is assumed to be zero from 2009 onwards but 275 000 if net overseas migration is assumed to be 180 000 per annum. Here, I am making the simple point that migration has a multiplier effect upon population growth.

2.5 Immigration: the importance of labour demand

A strong lesson from Australian history is that migration is driven by the balance between the demand for and the supply of labour. In every period of economic downturn, the early 1840s, the 1890s, the 1930s, the mid-1970s and the early to mid-1990s, net overseas migration fell to very low levels because of weak labour demand. Conversely, migration tends to be high during economic upswings. The number of migrants is often considered to be exogenous to what is happening in Australia—a number determined for somewhat arbitrary reasons by government. If immigration is contingent upon the state of the labour market, it is endogenous to economic conditions in Australia. This has been very much more the case over the

past decade, as migration to Australia has shifted heavily towards temporary forms of migration (see below).

From June 2000 to June 2010, employment in Australia grew by an average of 207 000 new jobs every year and the average annual rate of growth of employment was 2.1 per cent. Population grew at 1.5 per cent in the same period. Twelve per cent of the growth in employment in the past decade was due to increased labour force participation, mainly at the older labour force ages, and 88 per cent of the growth in employment was derived from population increase mainly due to migration but also in smaller part to the increased numbers in the older labour force ages.

If Australian employment were to continue to grow at its 2000–2010 level, an additional 2.55 million jobs would be created in the coming decade. Consistent with this, the Australian Treasurer in a press conference prior to the 2011 Budget stated that he expected an additional 500 000 jobs to be created in Australia over the next two years. Skills Australia projects a need for an additional 4.36 million workers in Australia over the next 15 years (2.2 per cent average annual growth).

Strong labour demand can be expected in Australia over the next decade because of:

- a pressing need for new infrastructure for water, transport, ports, energy supply, housing and office space, and state-of-the-art communications (electors have expressed their views on this at recent elections)
- massive new investment in the resources industry and the construction of numerous new developments (construction of many new resources developments has already been contracted, and governments continue to approve new resources projects)
- strong demand for workers in the health and education sectors
- the retirement of the baby-boom generation and generally rising living standards, which will create strong demand for a wide range of services related to consumption and recreation.

In Queensland alone, on 6 April 2010 the Queensland Coordinator-General reported 39 major projects (principally in the resources sector) undergoing assessment, with a total labour requirement (construction and operations) of 81 342. Department of Mines and Energy research indicates that each direct job in mining has a multiplier of 4.3 across Queensland. A Treasury working paper (McKissack et al. 2008) estimated that the increase in population from migration (international and interstate) required to meet labour demand in the immediate future would be 91 000 per annum for Queensland, compared to the 2009-10 actual figure of 49 000.

Reconstruction following floods and cyclone damage will demand even more labour in Queensland.

In sharp contrast with this strong labour demand, the increase in the labour supply from domestic sources will be close to zero in the next decade because of the retirement of the baby-boom generation and because increases in participation are likely to be small (McDonald and Temple 2008). If net migration were to average zero from 2009 onwards, the Australian population would still grow by 1 125 000 between 2009 and 2019, but the working ages (15–64) would grow by just 21 000, while age group 65+ would grow by 944 000. The advantage that the Australian economy has had through a concentration of its population in the labour force ages is about to end, and this has implications for the growth of GDP per capita (see below).

Skilled permanent migration program

It is little recognised that the skilled categories in the Government's permanent migration program provide very few new jobs in the Australian economy. The skilled independent intake in 2009-10 was 35 800. Of that number, around 7000 were already employed in Australia and approximately 8000 continued to reside outside Australia. Furthermore, the total included the children and partners of the principal applicants. This category would have provided fewer than 20 000 new workers to the Australian labour force. The employer sponsored category numbered 41 000 in 2009-10, but almost 36 000 of those were already employed in Australia, meaning the net gain was only 5000. In sum, these, the two largest categories in the skilled migration program, contributed no more than 25 000 new workers to the Australian labour force compared with an annual increase of over 200 000.

People who qualified for permanent residence as partners of Australian citizens (45 000 in 2009-10) represented a much larger potential pool of new workers in Australia, but little is known about their employment patterns and their skill levels.

Temporary migration fills the shortfall

Because domestic sources and the Government's permanent migration program have not been able to meet the strong labour demand in Australia, the gap has been filled by strong growth in temporary migrants. Today, almost 10 per cent of the Australian labour force is made up of temporary residents of Australia. The main categories of employed temporary residents are overseas students (including 486 visa holders), New Zealand citizens, long-stay business visa holders (subclass 457), working holiday makers and people holding bridging visas. Between 2004-05 and

2007-08, net overseas migration to Australia increased by 130 000, of which 119 000 (91.5 per cent) were temporary residents.

Skill level of immigrants

There are questions about the skill level of immigrants to Australia, both permanent and temporary. Before the changes made in 2010, the skilled independent category in the permanent program consisted almost entirely of accountants, cooks and hairdressers. This situation was corrected by Minister Evans in a policy announcement in February 2010. Partners of Australians do not need to be skilled to obtain permanent residence, but many probably are skilled. Likewise, New Zealand citizens do not need to be skilled in order to work in Australia, and the best estimate is that they are spread across the full skill range. Long-stay business visa holders are generally very highly skilled, and most are in the four highest skill occupational categories. So far, in 2010-11, 76 per cent of applicants have been managers and professionals. Students and working holiday makers are usually skilled people, but a majority are employed in lower skilled jobs. Australian citizens leaving to work overseas are generally highly skilled.

In sum, Australia's net migration gain is not a gain that necessarily consists heavily of skilled workers. The new additions to the labour force are likely to be spread across the range of skills, indicating that the strong demand for labour in Australia is not just a demand for high-skilled workers.

Future course of net overseas migration

As long as the majority of additions to the Australian labour force are temporary immigrants, it can be expected that the level of net overseas migration will change substantially from year to year. This is borne out by the fact that net overseas migration has fluctuated enormously in the past few years. This is because the flows in the temporary categories are highly responsive to fluctuations in labour demand and to other changes, such as the changes that were made in relation to overseas students in 2010. The long-stay business visa was designed as an approach that would be highly responsive to shifts in labour demand and it has proven itself to be just that. The number of new visas fell sharply with the onset of the global financial crisis but is beginning to increase again.

The inevitable fluctuations mean that, for policy purposes, consideration needs to be given to the average level of net overseas migration over several years, rather than to the number in any particular year.

Given that labour demand will be extremely high in the next decade and domestic sources of labour highly constrained, there is a very strong likelihood that international migration will remain high across the decade. Because, relative to demand, the permanent skilled program provides only a small number of new workers to the Australian economy, the strong likelihood is that the labour demand will continue to be met by temporary entrants to Australia.

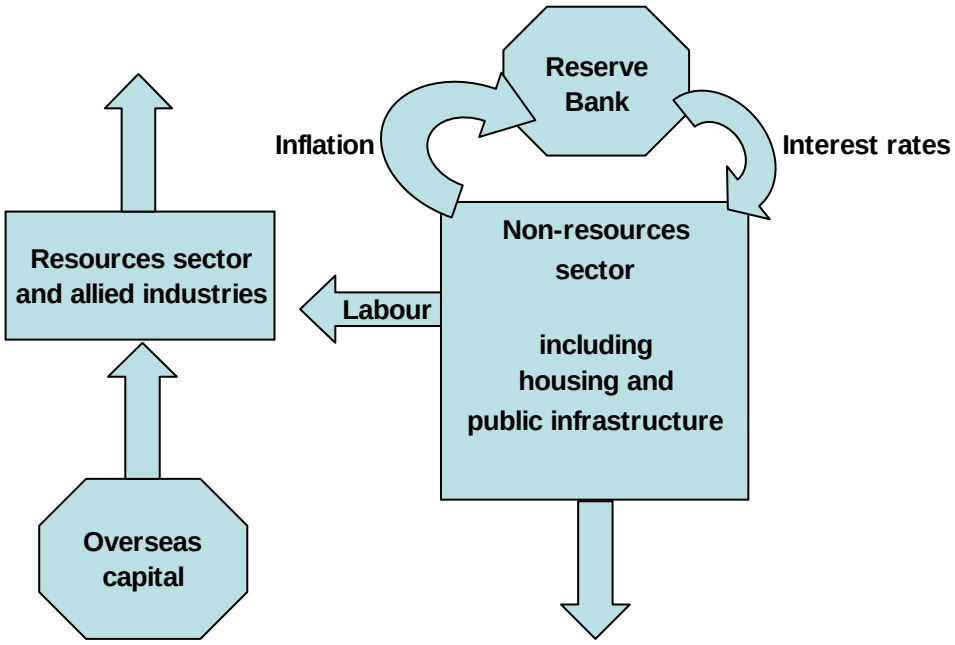
2.6 Economic implications

There is a concern that immigration, through competition, may lower the wages of existing Australian residents, particularly those with lower skill levels. Contrary to this, a recent international comparative study in a National Bureau of Economic Research working paper (Docquier et al. 2010) shows that immigration increases the wages of non-immigrants in Australia to an extent matched by no country other than Singapore, and that the benefits are greater for non-immigrants with lower skills.

McDonald and Temple (2010) have shown that the rate of growth of GDP per capita will tend to fall sharply in the next decade because of the retirement of the baby-boom generation. Immigration cannot eliminate this effect but it can significantly reduce the impact. With zero immigration, all else being equal, the ageing effect will reduce the rate of growth of GDP per capita from 1.7 per cent in 2010 to 0.8 per cent in 2020. With net migration of 180 000 per annum, the rate of growth would fall to 1.1 per cent per annum by 2020.

More important, however, is the effect upon the economy of a gross excess of labour demand over labour supply if international migration were to be severely constrained. The effects are shown graphically in Figure 2.3 in a dual-economy, 'Dutch disease' framework. The diagram displays the resources and allied industries sucking labour out of the non-resources sector because they pay much higher wages and because, with a fly in, fly out approach, the labour markets are the same (the capital and regional cities). Inflation is the likely consequence of labour demand grossly exceeding labour supply. Inflation, in turn, would lead to increases in interest rates, making it even more difficult to finance required housing and infrastructure. But the increased domestic interest rates would have little to no effect upon the resources boom because its capital is sourced largely from overseas. The pain that Australians are now feeling from inadequate housing supply and outdated public infrastructure would only be exacerbated.

Figure 2.3 **Why immigration is part of the solution**



A planned, well-managed immigration program over the next decade will enable the achievement of a reasonable balance between labour demand and labour supply, contribute to a stable, growing economy that will increase the living standards of Australians, and help to generate wealth that can be used to build public infrastructure and to finance environmental improvements.

Given that population growth in the coming decade will be highly contingent on labour demand, it is very surprising that Australian governments do not make estimates of future labour demand over a decade. We should routinely have estimates available of the number and type of labour that will be required and where it will be required. These estimates are required for both education planning and migration planning. Such estimates will always contain a relatively high degree of error 10 years out, but estimates would be revised each year and reasonable estimates are preferable to a vacuum of information as at present. Most future growth is likely to be in the major cities, but better estimates of future regional labour demand would inform policy.

2.7 Directions for policy

The policy directions described here, adapted to the national level, are addressed in more detail in the June 2010 report published by the Local Government Association

of Queensland, *Public Inquiry on the Need for a State Population Policy (McDonald Inquiry)* (LGAQ 2010). More detail can be obtained from the report.

Substantial future population growth over the next decade and perhaps in the following decade is already embedded in the Australian economy, and there appears to be little immediate prospect of low rates of population growth through reasonable policy initiatives available to the state or federal governments. From this perspective, the key issue becomes one of effective growth management, seeking to accommodate growth without compromising livability, affordability and long-term ecological sustainability.

Rapid population growth and the existing backlog of required work implies significant upfront investment in new public infrastructure to meet the needs of both existing and new residents. This needs to be reflected in the budget planning of the Australian Government and the State and Territory governments. There needs to be a partnership approach across all spheres of government to ensure that funding is obtained for the infrastructure that is required to support growth. Alternative financing mechanisms should be investigated to supplement current funding arrangements.

Infrastructure investment can play an important role in supporting growth in those regional areas facing strong labour demand. The critical nexus between regional job availability and population growth must be recognised as fundamental in any policy to support growth in regional Australia. Provision of quality infrastructure and services in regional centres will be a vital element of any such strategy. In the cities, strategies such as an increase in urban density and transit-oriented development are an integral component of population policy.

The National Housing Supply Council has identified a housing supply deficit of around 200 000 dwellings, and that number is increasing at the level of 25 000 dwellings per annum. More needs to be done to ensure that an adequate supply of dwellings suited to the range of household types is available, and to address areas of market failure in the delivery of planned housing outcomes. Improved monitoring and reporting on land and housing supply and prices will support initiatives to address affordability.

Barring a major downturn in the world economy, labour demand in Australia is likely to remain very strong into the future. It is essential that education and training strategies to address labour market stress are focused on ensuring that skills obtained by Australians are appropriate to the changing structure of the labour market and that there is not a disconnect between qualifications and skills gained

and the employment opportunities and labour market needs. There is a need for greater focus on technical and professional skill development.

State of the environment reporting indicates that there have been declines in environmental values, including loss of biodiversity, declines in waterway health and declines in livability in many parts of Australia. Current state of the environment reporting is considered to be too infrequent to ensure the early detection of sustainability problems, particularly where rapid growth is taking place. There is a need to implement initiatives related to biodiversity loss, waterway health, open space networks and regional landscape values to address declines in environmental values and to support the goal of ecologically sustainable development.

The scope, strength and dimensions of the debate about population growth, and its potentially divisive character, justify an explicit statement of population strategy by the Australian Government.

References

Docquier, F., Özden, C. and Peri, G. 2010, *The Wage Effects of Immigration and Emigration*, NBER Working Paper 16646, National Bureau of Economic Research, Cambridge, www.nber.org/papers/w16646.

LGAQ (Local Government Association of Queensland) 2010, *Public Inquiry on the Need for a State Population Policy (McDonald Inquiry)*, LGAQ, Brisbane.

McDonald, P. and Kippen, R. 1999, 'Ageing: the social and demographic dimensions', in Productivity Commission and Melbourne Institute of Applied Economic and Social Research, *Policy Implications of the Ageing of Australia's Population*, Conference Proceedings, AusInfo, Canberra.

——, —— (forthcoming), *Forecasting Births*, Report to the Australian Bureau of Statistics.

McDonald, P. and Temple, J. 2008, *Demographic and Labour Supply Futures for Australia*, Department of Immigration and Citizenship, Canberra.

——, —— 2010, *Immigration, Labour Supply and Per Capita Gross Domestic Product: Australia 2010–2050*, Department of Immigration and Citizenship, Canberra.

McKissack, A., Chang, J., Ewing, R. and Rahman, J. 2008, *Structural Effects of a Sustained Rise in the Terms of Trade*, Treasury Working Paper no. 1, 2008, Department of the Treasury, Canberra.