MIGRATION AND PRODUCTIVITY IN AUSTRALIA

DEAN PARHAM, HANG TO, NAZMUN RATNA, SUE REGAN AND QUENTIN GRAFTON
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Glossary

Capital
Assets such as buildings, plant, machinery, equipment that are used in production for extended periods (more than one year). Some capital is intangible. See Intangibles.

Capital deepening
Essentially an increase in the ratio of capital to labour. Technically, growth in the capital-labour ratio, weighted by the capital share of income.

Capital intensity
The extent to which production processes draw on capital inputs. Often measured as the ratio of capital to labour.

Capital productivity
The ratio of output produced to capital used, where capital refers to assets such as buildings and equipment.

Economic assimilation
Labour market assimilation or no gap between wages of migrant and non-migrant workers.

Educational attainment
Highest formal qualification of an individual.

Human capital
The skills, knowledge and experience embodied in an individual that are useful to firms engaged in production activities.

Labour compensation
The total cost of employing labour. This includes the wages paid to workers, plus on-costs such as employer contributions to superannuation, workers’ compensation premiums and payroll tax.

Labour productivity
The output of goods and services produced per unit of labour input (generally an hour worked).

Labour utilisation
The ratio of hours worked to the size of the population.

Linked employer-employee dataset
A dataset that links data on characteristics of employees with data on characteristics and performance of firms.

Market sector
That part of the economy for which the ABS provides productivity estimates. Industries included in the market sector have outputs that predominantly can be valued through the prices they fetch in market transactions. The problem with non-market sectors is that their output cannot be valued independently from their use of inputs, which renders productivity calculations meaningless.

Mobility
The propensity of individuals to relocate.
Multifactor productivity  The ratio of output produced to the combination of labour and capital used.

QALI (quality-adjusted hours labour input)  A measure of labour input that takes account of not only hours worked, but also the mix of skills used.

Skill composition  The distribution of hours worked across various skill categories.

Skill intensity  The extent to which the mix of skills is distributed towards high skills.

Spillover  A secondary or side effect on others who do not participate in a transaction or economic activity.

Trade creation effect  Trade creation occurs when common external barriers and internal free trade leads to a shift of production from high to low cost member states. In relation to migration-trade link, trade creation effect refers to the higher trade flows due to lowering of costs of trade.

Wage disadvantage  A difference in wage rate paid to one individual or group, compared to another, that can be explained in terms of productivity differences between the individuals or groups.

Wage discrimination  Payment of a wage rate below the level that would be based on productivity-enhancing characteristics.
### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
</tr>
<tr>
<td>EGWWS</td>
<td>Electricity, gas, water &amp; waste services</td>
</tr>
<tr>
<td>CSAM</td>
<td>Continuous survey of Australia’s Migrants</td>
</tr>
<tr>
<td>HILDA</td>
<td>The Household Income and Labour Dynamics in Australia (a survey funded by the Australian Government and managed at the University of Melbourne that provides panel (longitudinal) data on households.)</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and communications technology</td>
</tr>
<tr>
<td>IMT</td>
<td>Information, media &amp; telecommunications</td>
</tr>
<tr>
<td>IT</td>
<td>Information technology</td>
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<tr>
<td>LP</td>
<td>Labour productivity</td>
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<tr>
<td>MFP</td>
<td>Multifactor productivity</td>
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<tr>
<td>MS-12</td>
<td>12-industry market sector</td>
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<td>MS-16</td>
<td>16-industry market sector</td>
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<tr>
<td>QALI</td>
<td>Quality-adjusted labour input</td>
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<tr>
<td>SEIFA</td>
<td>Socio-Economic Indexes for Areas</td>
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Dean Parham is an expert on Australia’s productivity performance. He was long associated with Australia’s Productivity Commission where he developed and led the Commission’s ‘flagship’ program of productivity research. Since leaving the Commission in 2008, he has continued to investigate productivity trends and public policy issues in association with a number of government, academic and private-sector agencies including the Australian Treasury, the University of Adelaide, Australian National University and the Productivity Commissions of both Australia and New Zealand. He is currently a Visiting Research Fellow at the University of Adelaide and the Principal of Deepa Economics.

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Executive Summary

Context

It is widely acknowledged that productivity growth is central to national prosperity and improvements in living standards and that migration to Australia has been a major influence on the economy and society. Despite its importance, the relationship between productivity and migration is relatively unexplored in Australia. This report responds to this knowledge gap by evaluating conceptually and empirically productivity-migration linkages.

Over the past few decades, overall numbers of migrants to Australia have increased and their countries of origin have diversified. The proportion of skilled migrants compared to migrants coming for family reunification, or on humanitarian grounds, has also increased. Temporary migration has risen substantially, and along with it, the numbers of migrants who progress onshore to permanent migration from a temporary visa have grown. Over the same time period, Australia's productivity performance has varied markedly. For instance, the ‘surge’ in productivity growth of the 1990s was followed by a productivity ‘slump’ in the 2000s.

In this report, we look carefully at the factors that underpin productivity growth and focus on the relationship between migration and productivity.

Our approach

The brief for the project was to explore the links between migration, mobility and productivity. We developed a framework that conceptualises the links between migration and productivity. The mobility of migrants (their propensity to relocate) is one of the many factors that influence this relationship. The terms of reference for the project guided the scope and focus of our work.

Our analysis focused on key elements of the productivity framework:

- Using earnings as a measure of individual productivity, we compared the productivity of migrants and non-migrants, and of different types of migrant.
- By relating skills to productivity, we examined the contribution of migrants to productivity growth, including at industry and regional levels.
- By exploring two underlying determinants of productivity (social capital and trade), we examined the relationship between ‘connectedness’ and productivity.

We considered what new data and analysis would improve understanding of the links between productivity and migration, and we explored how public policy influences the productivity of migrants.

A productivity and migration framework

Productivity is the rate at which quantities of inputs are transformed into outputs of goods and services. It is about the efficiency of production.

There are different ways to define and measure productivity. Labour productivity is the amount of output produced per unit of labour input, which is usually measured by hours worked. Multifactor
productivity (MFP) is the amount of output produced from the input of labour and capital. It is an indicator of the influence of all the factors that determine how effectively labour and capital combine to produce outputs. Labour productivity growth comes from capital deepening and multifactor productivity growth.

Productivity is a concept that can be applied at many levels—individuals, firms, industries, regions and national economies. These different levels of analysis are interdependent and the relationships complex. National productivity cannot be viewed as simply a sum of the individual parts. To shed light on this complex picture, we use a framework of the determinants of productivity and consider how migration influences these determinants.

Our framework focusses on ‘immediate’ and ‘underlying’ determinants of productivity and on those factors that are potentially subject to influence from migration. This is in the context of ‘fundamental’ determinants such as climate, natural resources and distance from large markets.

- **Immediate determinants**—factors that are within the control of producers of goods and services when they make their production decisions. Major immediate determinants are physical capital, intangible capital, human capital and production knowledge.
  - Migrants can add to the effectiveness of these determinants. They most directly affect human capital by adding to the pool of skills and experience, altering the skill mix and relieving skill shortages. They can also influence the other immediate determinants.
- **Underlying determinants**—factors that are not within the immediate control of producers but do affect production decisions and the scope of opportunities to lift productivity growth. Major underlying determinants include funding for capital investments, the health and education systems, the nature and quality of infrastructure, international trade, the business environment, social capital and the strength and pattern of demand.
  - Migration can have a multitude of effects on underlying determinants. They can bring accumulated savings and foster links with sources of capital overseas. They can facilitate export and import linkages with their home countries.

The nature and magnitude of migrant effects on productivity depends on the size of the migration programme relative to the existing population, the selection of migrants and the visa category under which they enter. The ‘allocation’ of migrants to jobs, by whatever mechanism, also matters. In the short to medium term, the conditions in local labour markets will also determine the extent to which migrants are able to provide what they have to offer. Recent migrants tend to be more mobile and can be more flexible in meeting demands for labour in certain regions. A ‘job-matching’ perspective can also view migration as an alternative and/or complement to skill formation in the domestic population.

**Measuring migrant productivity**

The productivity of individuals can only be defined in the context of the work they do. A worker’s productivity reflects the capital available to the firm and the surrounding organisational arrangements. This means, in practice, wages are the only practical measures of individuals’ labour productivity when comparing productivity measures across industry sectors or groups of individuals. While there is a strong theoretical link between wages and productivity, there can be departures in
practice. Nevertheless, the empirical literature suggests that relative wages reflect relative productivity to a large degree and, perhaps to a greater extent in Australia than other countries.

There are some personal characteristics that could be considered to reflect potential productivity in a broad sense. The empirical literature has typically found age, gender, English-language proficiency, educational attainment and work experience to be positively associated with productivity.

A gap between wages of migrants and non-migrants is often found. However, this can reflect wage disadvantage (productivity-related differences) as well as discrimination (lower wages for the same productivity). Australia appears to have low wage discrimination against migrants. Migrants to Australia can have both wage advantages and disadvantages (although there are differences between studies on this).

- Those with advantages tend to be relatively-recent arrivals from English-speaking countries.
- Those with disadvantages tend to come from non-English speaking countries and the disadvantage appears to be associated with fluency in English, low skill or the transferability of human capital (qualifications and experience).

The international empirical literature suggests wage disadvantages between migrants and non-migrants do narrow over time, but wage assimilation only happens slowly. Nevertheless, most second-generation migrants suffer no wage (or wealth) disadvantage.

Our approach to investigate migrant productivity was to analyse wages for different groups (migrants and non-migrants) on the assumption that relative wages (or wage premiums) reflect relative productivity (or productivity premiums).

In our modelling, we sought to explain wage differences in terms of migrant/non-migrant status and a range of characteristics, covering demography, education, English fluency, among other factors. We also modelled employment and sought to explain the probability of being employed in terms of a similar set of variables. We used data on individuals from a number of sources. The two main sources were the Household, Income and Labour Dynamics in Australia (HILDA) data and Continuous Survey of Australia’s Migrants (CSAM) data. The Census and other databases on specific visa classes were used where appropriate.

We found that on average migrants have been more productive than non-migrants, as measured by earnings, and have increased their productivity more rapidly than non-migrants. For example, if we compare a migrant and a non-migrant in year 2011, we see that a migrant earns on average about 3 dollars more per hour than a non-migrant. In year 2012, a migrant earns about 3.6 dollars more per hour than a non-migrant; and in 2013, a migrant earns about 5 dollars more per hour than a non-migrant.

Migrants born in English speaking countries and migrants born in OECD countries are more productive, as measured by the hourly wage rate, than non-migrants, migrants born in non-English speaking countries, and migrants born in non-OECD countries. The probability of being employed for migrants and non-migrants is not significantly different.
English-language proficiency and level and type of education are important explanatory factors in labour market performance of migrants.

- English proficiency increases productivity, as measured by earnings, as well as probability of getting paid employment.
- Having a university education increases productivity and probability of paid employment.
- Highest qualification being an Australian qualification does not affect productivity, but does increase probability of being employed.
- Having an overseas post-school qualification does not increase the probability of getting a job, but does increase migrants’ productivity.
- Migrants whose fields of study had been health and education are more likely to be employed than migrants in other fields of study or migrants without tertiary education.

The visa class of permanent migrants influences their productivity and employment outcomes:

- Migrants on Employer or State sponsored and Skilled Independent visas have a higher hourly wage and have a higher likelihood of having a job compared to migrants on Family visas.
- The unemployment rate is lowest for migrants on Employer sponsored visas and highest for migrants on Family visas. Unemployment rates are similar for migrants on State-sponsored visas and on Skilled Independent visas.
- Migrants with onshore visas earn more per hour and are more likely to have a job than migrants with offshore visas.

Temporary migrants show the following productivity-related characteristics:

- Migrants with 457 visas whose first language is English are more productive and more likely to have trained other workers at their place of work while in Australia.
- Working Holiday Makers earn significantly less per hour compared to non-migrants and permanent migrants.
- Working Holiday Makers with a university qualification and who are more fluent in English are less likely to do farm work.
- A larger percentage of international students from English speaking countries earn a higher income compared to domestic students and students coming from non-English speaking countries.

**Migration, skills and productivity**

There have been three distinct periods in Australia’s productivity performance over the past three decades:

- a period of baseline productivity growth from 1984-85 to 1993-94;
- a surge in productivity growth from 1993-94 to 2003-04; and
- a productivity growth slump from 2003-04.

Other factors over the past two decades have swamped any influence that migration may have had on Australia’s productivity performance. In particular, the mining boom has led to a vast increase in capital formation that, to date, has not been matched by growth in the volume of production.
Hence, productivity has declined. Higher commodity prices have lifted profitability but not productivity.

Work performed by migrants is more skilled on average than work performed by the Australian-born. Overall wage rates do not differ substantially between migrants and non-migrants in the same skill categories, although migrant degree holders are paid somewhat less than their Australian-born counterparts. Because their work is more skilled, migrants enjoy a 6 per cent wage advantage over the Australian-born.

We used the ABS quality-adjusted labour input (QALI) methodology to assess the contribution of migration, in a statistical accounting sense, to an increase in workforce skills and to productivity growth between 2006 and 2011. Our key findings are:

• Migrant labour has grown more rapidly than Australian-born labour, in terms of both hours worked and skill.
• Migrants’ increase in skill has come about solely from growth in qualifications, whereas upskilling of work for the Australian-born has come from a combination of increased qualifications and more workforce experience.
• Migrant workers have become younger on average, to some extent offsetting the ageing of the Australian workforce.
• The QALI methodology suggests that migrants have met a third of the increase in skill requirements of work in the market sector.
• Migrants account for about 0.17 of a percentage point of annual labour productivity growth between 2006 and 2011. To put this figure in perspective, this is equivalent to 7 per cent of the average rate of labour productivity growth between 1994-95 and 2007-08. In terms of MFP, migrants accounted for 0.1 of a percentage point of annual growth—equivalent to 10 per cent of the growth in average MFP over the same period.

Migrants are more highly represented than their Australian-born counterparts in manufacturing, in health and social assistance services and in professional, scientific and technical services. Migrants contributed to increased skills in all broad industry groups, but especially in financial and insurance services, wholesale trade, and the information, media and telecommunications industries. These industries are where migrants made the largest contributions to industry productivity growth.

Most of the migrant upskilling occurred in metropolitan areas, whereas the shift to employing migrants with less experience (younger age) in Australia mostly occurred in regional areas. By contrast, the more-rapid upskilling of migrants, in comparison to the Australian-born, occurred in metropolitan areas, as the skill contributions of migrants and non-migrants were identical in regional areas.

**Connectedness and productivity**

Based on existing literature in different countries, we have examined two of the underlying determinants of productivity: social capital and international trade.
Migrants with higher bridging social capital (social networks between heterogeneous groups) can facilitate bilateral trade by reducing costs of trade (created through barriers to communication and cultural differences between the host and foreign countries).

Migrants’ connectedness and their knowledge about business practices can reduce trade-inhibiting impact on host countries’ exports if the migrants’ countries of origin are culturally very dissimilar to the host country and if they have weak formal institutions. As a result of their complementary knowledge base, skills sets and experiences, migrants are able to promote innovation through knowledge diffusion among migrants and non-migrant workers.

Business migrants have successfully contributed to trade creation effects by facilitating transnational business networks.

Migrants’ connectedness affects the economic assimilation of their children because of ethnic capital and bonding social capital (social networks between homogeneous groups) in the neighbourhood and schools, particularly if the migrant families are residing in segregated neighbourhoods.

Migrants’ connectedness not only influences economic outcomes, but different aspects of social, cultural and political wellbeing of a society and, thus, wellbeing can complement productivity as a guide for migration policy.

**Data gap analysis**

Limited data on temporary migration (and on migrants as they move from temporary to permanent residence) makes it difficult to analyse labour market outcomes and productivity for temporary migrants. Data by specific visa categories that is longitudinal in character is limited, making analysis of productivity changes over time challenging. Currently, it is not possible to assess the distinct contribution of business migrants (from other skilled migrants) using current datasets.

The Longitudinal Survey of Humanitarian Migrants will be a valuable source of data for evaluating economic and social contributions of humanitarian migrants over time, once the data is available.

The ability to explore the links between individual productivity and earnings is hampered in Australia by the absence of linked employer-employee datasets (LEED). If a LEED is created in Australia, consideration should be given to inclusion of demographic and social variables like country of birth, ethnicity, language proficiency, place where the highest education and/or training is obtained, nature of sponsorship received and year of arrival. In general, data on social variables, including religion and ethnic background, is lacking and would provide useful data on social capital and connectedness and could be collected by extending the questionnaires of current datasets.

**Policies affecting migrant productivity**

Policies that may affect migrant productivity are many and varied. They include three major areas: (1) migration policies that affect the type of migrants gaining entry to Australia; (2) a wider set of government policies that affect productivity post-arrival in Australia; and (3) the broader citizenship
and multicultural policy environment. Successive governments have placed different emphases on, and within, these agendas.

Overall, Australia’s migration policies have increasingly favoured skilled migration over family migration and this influences the impact migration has on productivity. Migration selection programmes based on skills have existed since the 1970s and today give preference to migrants who are relatively young, more qualified and experienced, proficient in the English language and with skills sought by Australian employers. This is a consequence of changes to the selection criteria over time which have increased education requirements and English language proficiency. Greater weight has also been given to skills demanded by employers in the points test, and employers themselves have been given the ability to select migrants through employer sponsorship, for either permanent or temporary residence. Based on our findings it would seem that such polices have a positive effect on labour productivity.

Post-arrival in Australia, migrant productivity may be affected by a range of government policies. Access to education and labour market programs can be important for migrants as they both seek work and progress in work. Settlement services can be particularly important for family and humanitarian migrants. Given the importance of English-language proficiency for good labour market and productivity outcomes, access to English-language programs, such as the Adult Migrant English Program, can be valuable for some migrants. Policies that facilitate recognition of foreign qualifications enable migrants to make the most of their skills and education and, thus, be more productive. The broader citizenship and multicultural policy environment can affect the settlement experience of migrants, who they interact with and their productive engagement in work.

**Conclusion**

Disentangling and quantifying the relationship between migration and productivity is fraught with conceptual and empirical challenges. Nevertheless, our findings do show that migrants have been more productive (as measured by earnings) and increased their productivity more rapidly than non-migrants. While our empirical analysis does not reveal the contribution of migration over the long term, it does show that migration has played an important role in labour market flexibility by helping to meet increased requirements for skills.

Overall, we think it is reasonable to claim that migration has had a (weakly) positive impact on aggregate productivity in Australia over the period studied. Having said this, the transformation in the Australian economy over the past two decades has dominated any productivity performance that may have occurred as a result of migration. However, if the counterfactual (an Australia without immigration or with a very different migration pattern) is considered, stronger conclusions might be drawn. Our economy and indeed higher education system would be very different today without the high levels of skilled migrants and students over recent decades. We cannot quantify how different, but they hint at the productivity effects of migration that cannot be captured in empirical analysis.
1 INTRODUCTION

1.1 Background to the project

This project has been undertaken as part of research services being delivered under the Memorandum of Understanding between the Australian National University and the Department of Immigration and Border Protection (DIBP). The project fits within the overall DIBP Research and Evaluation Programme 2014-15.

The project was initiated in June 2014 and an initial feasibility phase was completed by the end of October 2014. A workshop with academics and public servants from across government was held during the feasibility phase. Two interim outputs have been produced—an annotated bibliography and a review of available data. These are included as appendices to this report.

The final report has been subject to peer review.

1.2 Terms of reference

The initial brief for the project was to explore the links between migration, mobility and productivity. Chapter 2 sets out a framework for how we are conceptualising the links between migration and productivity. The mobility of migrants is one of the factors that influence this relationship.

The Terms of Reference for the project requested the following:

1. An overview of the existing data sets suitable for understanding, measuring and explaining differences in productivity between migrants and native-born Australians including, to the extent possible, the effects of different migrant streams and over time.
2. A gap analysis of what data needs to be collected, over and above existing data, for understanding, measuring and explaining productivity differences between immigrants and native-born Australians.
3. A concise review of the key literature on productivity and migrants with a focus on Australian studies.
4. An explanation of the extent to which earnings, or other indicators, can be used as measures of individual migrants’ productivity.
5. Suggestion of a framework for considering the relationship between individual productivity, national productivity and immigration.
6. A critical evaluation, based on currently available data, that comprises:
   a) Empirically measured and model-based estimates of productivity differences between immigrants and native-born Australians including, to the extent possible, the effects of different migrant streams.
   b) Explanations of the nature of productivity differences between different streams of migrants and native-born Australians based on empirical models developed by the group.
   c) A review of productivity growth by market sector over the past 25 years and, as far as possible, a considered assessment of the effects, if any, of migration on productivity differences across sectors (such as industry and region) and over time.
d) An overview of the policy interventions by the Australian government that may have
affected the productivity of migrants to Australia relative to native-born Australians.

e) An overview of the effects of levels of ‘connectedness’ (bridging across the group and
organisational social capital) of permanent migrants within the host country and with
their country of origin through trade and investment networks; and suggest a
framework to evaluate the relationship between connectedness and productivity,
including how second generational effects could be assessed.

f) An overview of the effects of education levels and vocational training, both overseas
and in Australia, on the productivity of migrants relative to native-born Australians.

We have followed these terms of reference as far as has been possible given data availability and
time and resource constraints. In each chapter, we explain our approach to addressing the terms of
reference.

This report broadly covers all types of migrants. This includes citizens, permanent residents and
temporary residents. However, we have been limited by the availability of data and by the
limitations of existing datasets. This is discussed in some detail in Chapter 8: Data Gap Analysis. As a
result our analysis does not differentiate by all types of visa and, in particular, we do not specifically
assess the productivity of humanitarian migrants. The most recent analysis of the economic
contribution of humanitarian migrants is provided by Hugo (2014).

1.3 Our approach

Our approach has been to undertake the following conceptual and empirical analyses:

- We have developed a framework for considering the relationship between migration and
  productivity (Chapter 2).
  • The framework sets out various determinants of productivity (for example, human and
    physical capital) and describes the complex relationships that can exist between the
determinants. We explore how migration can influence these determinants.
  • We show how the concept of productivity can apply at many levels—individuals, firms,
    industries, regions and national economies—and that these levels are interdependent.

- We focus in more detail on parts of this productivity framework and examine specific
determinants, relationships and levels within the framework (Chapters 3, 4, 5 and 6) by:
  • Relating skills to productivity and examining the contribution of migrants to productivity
growth, including at industry and regional levels.
  • Using earnings as a measure of individual productivity and evaluating the productivity of
    migrants to non-migrants, and of different types of migrant.
  • By exploring two of the underlying determinants (social capital and trade) and describing
    the relationship between ‘connectedness’ and productivity.

- In the final chapters (Chapters 7, 8 and 9), we consider what new data and analysis would
  improve understanding of the links between productivity and migration (i.e. to examine some of
  the key ‘missing links’ in our productivity framework) and provide an overview of how public
  policy influences the productivity of migrants.
1.4 Project members

This project has been undertaken by a team of researchers with links to the Crawford School of Public Policy at the Australian National University.

The analysis was carried out by Dean Parham (Chapters 2, 3 and 4), Hang To (Chapter 5 and Appendices A and B), Nazmun Ratna (Chapters 6 and 7) and Sue Regan (Chapter 8). Quentin Grafton provided expert advice and oversight throughout the project. Sue Regan managed the project.

Biographies of the team are set out in ‘About the authors’ at the start of this report.

1.5 Migration and productivity: the context

Migration to Australia is a major influence on our society and economy. Migrants are an increasing proportion of the Australian population. In every year since 2006, migrants have contributed more to population growth than is occurring through natural increases (ABS, 2014).

Migrants come to Australia on a permanent or temporary basis.

Permanent residents come through the Migration Programme (Skill Stream and Family Stream) and through the Humanitarian Programme. Some New Zealanders come through the Migration Programme, but many more settle in Australia under the Trans-Tasman Travel Agreement (and remain New Zealand citizens). Temporary residents come on either a visitor visa or a temporary resident visa. The latter includes Students, Working Holiday Makers and those on Temporary Work (Skilled) (subclass 457) visas.

There is a strong link between temporary and permanent residence. The proportion of migrants who progress onshore from temporary to permanent migration has risen over the last two decades, as discussed below.

1.5.1 Permanent residents and the Migration Programme

In 2013-14, just over 200,000 permanent migration visas were granted. This represents a decrease of 4.2 per cent on the previous year. The bulk of these migrants (190,000) came through the Migration Programme while the remainder (13,768) came through the Humanitarian Programme (For further information on this and all current statistics and programmes, see Australia’s Migration Trends 2013-14, DIBP 2015).

Within the 2013-14 Migration Programme, 67.7 per cent (128,550) were granted visas through the Skill Stream and 32.2 per cent (61,112) through the Family Stream. The Special Eligibility visa category accounted for the remaining 228 visas.

In 2013-14, the top three nationalities granted a Migration Programme visa were Indian (39,026 places), Chinese (26,776) and from the United Kingdom (23,220). Changes since 2012-13 were mixed, with modest falls in Indian nationals (2.6 per cent) and nationals of China (2.0 per cent).
Visas granted through the Migration Programme go to Primary applicants and their dependents (Secondary Applicants). In 2013-14, dependents accounted for 52.1 per cent of the Skill stream, 14.9 per cent of the Family Stream, and 40.1 per cent of the overall Migration Programme.

Since 1997-98, the Skill stream has been the main component of the Migration Programme. In 2013-14 it represented 67.7 per cent of the Migration Programme, increasing from 51.5 per cent in 1997-98.

Australia’s Skill Stream has four elements: Points Tested Skilled Migration (58.1 per cent, 2013-14); Employer Sponsored visas (36.9 per cent); Business Innovation and Investment visas (4.8 per cent); and Distinguished Talent (0.2 per cent).

Australia’s Humanitarian Programme has an offshore resettlement component (11,016 visas granted in 2013-14) and an onshore protection component (2,752 in the same year).

1.5.2 Visitors and temporary residents

Almost 4.0 million temporary visas (including visas for tourists and workers) were granted in 2013-14, a historic high.

The top source countries were the People’s Republic of China (549,458 offshore visas granted), the United Kingdom (546,911) and the United States of America (389,086). Changes on previous years are mixed, but the most notable change since 2011-12 is the increase in Chinese visitors, up 39.5 per cent.

Student visas grew strongly in 2013-14. The second highest level on record was reached with 292,060 visas granted. The most substantial increases came from India (up 37.6 per cent on 2012-13) and China (up 11.7 per cent on 2012-13).

Working Holiday Makers visas dropped 7.2 per cent in 2013-14 to 239,592, from 258,248 visas granted in the previous year.

Temporary Work (Skilled)(subclass 457) visas decreased markedly in 2013-14, falling 22.0 per cent from the 2012-13 figures (98,571 down from 126,348).

These very recent changes should not distract from the longer-term and overall trend which has seen a major growth in temporary work movements into Australia. (See Figure 1.4)

This increase in temporary migration has fed through to the Migration Programme and the granting of permanent visas. The proportion of migrants who progress to permanent migration from a temporary visa (onshore) compared to those who apply outside Australia (offshore) has risen over the last two decades. In the mid-90s, around 1-in-5 visas in the Migration Programme went to people already in Australia on a temporary basis. By 2013-14, this had increased to 1-in-2 (50.4 per cent).

Changes to the Skill Stream of the Migration Programme, over the last few years, have significantly reduced the number of students who obtain permanent residence. A Temporary Graduate subclass visa was also introduced in March 2013. This visa does not offer students a direct application
pathway to permanent skilled migration, although students may still go on to become permanent residents through other routes.

Table 1.1 Key migration figures: visas granted 2013–14

<table>
<thead>
<tr>
<th>Permanent migrants</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Migration Programme</td>
<td>190,000</td>
</tr>
<tr>
<td>Skill stream</td>
<td>128,550</td>
</tr>
<tr>
<td>Family stream</td>
<td>61,112</td>
</tr>
<tr>
<td>Special eligibility</td>
<td>228</td>
</tr>
<tr>
<td>Family – Expert Panel on Asylum Seekers</td>
<td>1,165</td>
</tr>
<tr>
<td>New Zealand Citizens</td>
<td>3,014</td>
</tr>
<tr>
<td>Humanitarian Programme</td>
<td>13,768</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>207,947</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temporary entrants</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitors (offshore)</td>
<td>3,969,215</td>
</tr>
<tr>
<td>International students</td>
<td>292,060</td>
</tr>
<tr>
<td>Working Holiday Maker Programme</td>
<td>239,592</td>
</tr>
<tr>
<td>Temporary Work (Skilled)</td>
<td>98,571</td>
</tr>
<tr>
<td>Other</td>
<td>105,901</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,705,339</strong></td>
</tr>
</tbody>
</table>

Source: DIBP (2015)

1.5.3 Migration trends

Over time, the scale and composition of migration to Australia has changed dramatically. The main trends over the last few decades include:

- An increase in overall numbers and a diversification of the countries of origin;
- An increase in the proportion of skilled migrants compared to migrants coming for family reunification and humanitarian grounds;
- A large increase in temporary migration and a corresponding increase in the proportion of migrants who progress to permanent migration from a temporary visa.

These trends reflect what has been described as the three principal revolutions in migration since the Second World War (Pezzullo, 2015). The first revolution was the mass post-war immigration from the UK and continental Europe. The second was the rise in skilled and highly educated migrants to Australia. The third is the migration of skilled workers resident on a temporary basis.
Migration patterns are a consequence of highly complex domestic and international forces. Chapter 8 sets out some of the significant domestic policies that have contributed to these trends.

**Trend 1 - Increase in numbers and diversification of countries of origin**

Figure 1.1 illustrates how overall numbers of migrants have increased and that migrants in more recent decades are arriving from a wider range of regions than in previous decades. For example, in 1961-70 (dark orange), the vast majority of migrants were from the United Kingdom and the rest of Europe. In 2001-10 (maroon), migrants came from a much broader range of regions, particularly from across Asia.

**Figure 1-1 Numbers and countries of origin over time**

Source: Figure 2 - Overseas born population by source region and year of arrival to Australia in The Place of Migrants in Contemporary Australia, (DIBP, 2014). Southern Asia includes Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Chinese Asia includes China, Hong Kong, Macau, Mongolia and Taiwan.

Figure 1.2 shows the trend in Net Overseas Migration (NOM) and illustrates how more of Australia’s population growth now comes from NOM rather than natural increases.
Figure 1-2 Components of Australia’s population growth

Source: Figure 6.1 - Components of Australia’s population growth, 1982 to 2014 (DIBP, 2015 forthcoming).

Source data: ABS Australian Demographic Statistics (3101.0)
Net Overseas Migration (NOM) estimates contain a break in series. Estimates for the September 2006 quarter onwards use an improved methodology and are not comparable with NOM estimates from earlier periods. Data points are based on one year of NOM at quarterly intervals covering the period June 1982 to December 2013.

Trend 2: Increase in skilled migration compared to family and humanitarian migrants

Since the 1980s, there has been a marked increase in the proportion of skilled migrants within the Migration Programme. The number of migrants coming through the Family Stream has been broadly steady, but represents a declining proportion of the overall programme. See Figure 1.3. During this period, the numbers of humanitarian migrants have varied (between around 10,000 to 20,000 migrants) but there has been no overall trend increase.
Trend 3: Increase in temporary migration

The increase in temporary migration compared to permanent migration has been the big story of migration trends over the past decade. In the last couple of years, some categories of temporary entrants (in particular Working Holiday Makers and Temporary Work (Skilled)(subclass 457) visa holders) have decreased, but DIBP forecast increasing numbers of temporary migrants overall. Figure 1.4 shows numbers of permanent migration and different forms of temporary migration over time.

Source: Various Population flows publications and annual reports—Migration Reporting, DIBP.
Figure 1-4 Temporary to Permanent over time

![Graph showing temporary to permanent migration over time](image)


1.5.4 Productivity trends

Chapter 4 describes Australia’s productivity drivers and growth since the 1970s. It outlines the ‘baseline’ (1970s and 1980s), ‘surge’ (1990s) and ‘slump’ (2000s) periods of Australia’s productivity growth and the main factors that have led to changes in trajectory of productivity growth. The surge came as the result of economic reforms in combination with the IT revolution. The slump has been due predominantly to adjustment in the mining sector as new capacity is installed to take advantage of higher commodity priced.
While migration has been increasing, productivity growth has surged and slumped as a result of other major causes. We therefore need to look carefully underneath the major and obvious productivity trends to see the milder but steadier relationship that migration has with productivity. This is the focus of chapter 4.

1.6 Migration and productivity: summary of the literature

An annotated bibliography was prepared to inform this project. This is included in the appendices to this report. The aim of the literature review was to scope the main areas of research relevant to the project. This covers many areas of study. We have not undertaken a comprehensive academic literature review of each area of study, and so do not claim it is a complete account of the research.

The summary of research literature below describes the main areas of work relevant to the project. These and other references are used throughout the various chapters. The summary serves as a broad overview and to point the reader to where they might seek further detail. The terms of reference seek a focus on Australian literature; international literature is included where particularly relevant. In this summary, we set out the literature under four broad themes:

- Understanding productivity and its links with migration
- Migrant labour market outcomes, skills and education
- Wealth, innovation and connectedness
- Policy evaluation and debate
1.6.1 Understanding productivity and its links with migration and mobility

A wide literature exists on defining and measuring productivity and identifying the underlying causes of changes to productivity growth. Chapter 2 (the Productivity Framework) and Chapter 3 (Measuring the productivity of individual migrants) draws on a number of these studies. For example, von Briesebroeck (2010) and Forbes et al (2010) cover some of the challenges of measuring individual productivity, highlighting the difficulty of measuring actual labour productivity directly.

The economic consequences of migration to Australia have been considered by a range of authors. In the 1980s, a major economic study undertaken by Neville and Meikle (1985) on the economic effects of immigration to Australia contributed to a greater policy focus on skilled migration. More recently, Withers (2003) provided an overview of the economic aspects of migration. Hugo (2014) specifically considered the economic contribution of humanitarian settlers and Khoo et al (2013) examined the economic and social contribution of family migration. The Productivity Commission’s 2010 research paper on Population and Migration (Productivity Commission, 2010) explored the economic effects of immigration and population growth.

Significant parts of the international literature have explored the economic effects of migration in other countries. Borjas (1995, 2013) reviewed the economic benefits of immigration in the United States context and analysed the benefits to native-born Americans. Friedberg and Hunt (1995) provided an overview of the theoretical and empirical research on immigration’s impact on income growth and labour market outcomes of natives. Büchel and Frick (2005) explored the economic performance of immigrants and natives across Europe. Nathan (2014) surveys what he calls the ‘wider impacts’ literature—research which examines the impact of migration on the economy beyond the labour market. All the aforementioned papers illuminate links between migration and the economy, and some e.g. Nathan (2014) do cover productivity specifically.

The links between productivity and migration have been explored in a limited number of studies in Australia. Most notable is the Productivity Commission’s 2006 inquiry into the Economic Impacts of Migration and Population Growth (Productivity Commission, 2006), that looked specifically at productivity impacts as part of its terms of reference. The Productivity Commission’s inquiry concluded that migration has been an important influence on Australia’s economy and society but they considered it unlikely that migration has a substantial impact on productivity and income per capita. Rolfe et al (2013) reviewed the connections between migration and productivity at the firm level, drawing mainly on United Kingdom analysis. This paper includes a useful summary of existing studies on the impact of immigration on the productivity of firms. These effects include the complementarity and transmission of skills, aptitudes and knowledge of migrants and natives, through raising overall skill levels, and through bringing in knowledge and connections from and with other countries. This and other work is referred to in Chapter 6 (Connectedness and productivity).

A range of studies consider the impact of the mobility of migrants on the economy. Hugo and Harris (2011) explored internal mobility patterns of recent migrants to Australia and compared this with the Australian-born population. Interstate mobility (as opposed to intrastate mobility) was dominant among recent migrants compared to non-migrants. Overall, they show that recent migrants are most mobile during their initial months and years as they are adjusting to life in a new country.
Recent Productivity Commission research into geographical labour mobility (Productivity Commission, 2014) showed that recent migrants tend to be more mobile than the population in general. The work of Bell et al. (2015) compared internal migration in countries around the world, by developing indicators that can measure different dimensions of population mobility. The IMAGE project (Internal Migration Around the Globe) is an international program of research taking this work forward. A much wider literature is concerned with the ‘new mobilities paradigm’ (e.g. Sheller and Urry, 2006) which explores the theory and practice of global mobility, and its social, economic and environmental consequences. Overall, the trend towards increasing temporary migration is indicative of a more mobile international population.

### 1.6.2 Migrant labour market outcomes, skills and education

A range of studies have explored the employment outcomes of migrants and the integration of migrants into the host labour market. Several analyses have tried to disentangle ‘self-selection’ and ‘state/government selection’ to improve understanding of the labour market performance of migrants (see Borjas (1987), and Anetecol et al (2003) and Cobb-Clark (2000) for Australia).

More recently, Cobb-Clark et al (2012) compared methods for estimating immigrant wage and employment assimilation and Breunig et al (2013) examined unobservable differences (such as ambition and motivation) in their analysis. These and other studies are considered further in Chapter 3. A number of studies show that wage assimilation occurs slowly for all groups, but is slowest for those from non-English speaking backgrounds.

Gregory (2014) pointed to the ‘two-step’ Australian immigration policy (moving from temporary to permanent visa status) and used Labour Force Survey data to reveal its labour market consequences. This paper also provides an overview of some of the inadequacies of current data availability in Australia, in particular the lack of information on temporary migrants and on the experience of those moving from temporary to permanent visa status.

A number of studies have looked at barriers to integration and its economic impact. Ratna et al (2012) investigated the economic impacts of social diversity and consequent barriers of communication in Canada and the United States. Grafton et al (2007) modelled and tested the effects of social barriers to communication on productivity and capital accumulation to help explain the large differences in cross country productivity performance. They showed linguistic barriers reduce productivity and capital accumulation.

The OECD (2013) reviewed evidence on different forms of discrimination against migrants, including in labour markets. Overall, the OECD found that ethnic penalties (differences in wage rates) and unemployment for migrants compared to non-migrants were smallest in OECD countries such as Australia, Canada and the United States that were settled by migration. In Australia, Hahn and Wilkins (2013) found little evidence of wage discrimination. Junakar et al (2004) asked whether Asian migrants are discriminated against in the Australian labour market. They conclude there are significant ‘unexplained differences’ in the probability of men being unemployed which may be ascribed to ‘discrimination’. This question of whether discrimination is a factor in wage differentials is considered further in Chapter 3.
Many studies also examine the education and skills of migrants compared to non-migrants (e.g. Antecol et al, 2003 and Hunt, 2004) and whether migrants’ education and skills are being fully utilised in the labour market or whether they are over-educated in their occupations (Green et al, 2007, Neilson, 2009 and Chiswick, 2009). The literature includes examples of research into second generation effects of migration such as Lüdemann and Schwerdt (2013).

### 1.6.3 Wealth, innovation and connectedness

The savings and wealth of migrants compared to non-migrants has been examined in a number of studies. For example, Bauer et al (2011) investigated the wealth of immigrant households in Australia, Germany and the United States. In Australia, the wealth gap seems to exist because immigrants to Australia do not translate their relative educational and demographic advantages into a wealth advantage.

Jensen (2013) reviewed the international literature on the relationship between migration and innovation. This study showed a positive relationship between the two and is drawn from individual-level evidence, firm-level evidence and university evidence. Jensen (2013) used emerging new international analysis to suggest a number of ideas for improving the evidence base in Australia, including using the Department of Social Services’ Settlement Database matched to other administrative datasets containing information on innovation or entrepreneurial outcomes.

A number of studies consider the connections that migrants have within the host country and with their country of origin and, in particular, the impact this might have on trade and investment networks. This and other research is highlighted in Chapter 6. Co et al (2004) have summarised the literature on the connection between migration and international trade. Belot and Ederveen (2011) evaluated the cultural differences in migration between OECD countries and suggested cultural differences explain migration flows better than traditional economic variables (such as income and unemployment differentials). Tadesse and White (2010) asked whether immigrants counter the effects of cultural differences between countries. Their analysis showed immigrants exert a pro-export effect that partially offsets the trade-inhibiting effects of ‘cultural distance’. Peri and Requena-Silvente (2010) also find immigrants significantly increase exports, in the case of Spain.

Fullilove and Flutter (2004) assessed the ‘world-wide web’ of Australians and provided evidence that outward migration by Australians can generate positive feedback effects, particularly in terms of the diaspora of business and knowledge networks. The impacts of outward migration on receiving countries are beyond the scope of this project.

### 1.6.4 Policy developments and debate

Chapter 9 uses a range of sources to review policies that might affect migrant productivity. A number of studies try to disentangle the effects of ‘self-selection’ from ‘state/government selection’ (e.g. Cully, 2011) to help assess the impact of immigration policies. Cully’s analysis shows that, in the Australian context, migration selection policies do ‘work’ in delivering better migrant labour market outcomes than would accrue if migrants were chosen at random.

Wulff et al (2008) examine the ‘new paradigm’ in international migration, that is, regional migration policies that encourage new arrivals to settle in hinterlands or low-growth areas, rather than major
cities. Taylor et al (2014) explore the benefits of skilled migration programmes for regional Australia, specifically the Regional Sponsored Migration Scheme (RSMS) and the State Specific Regional Migration (SSRM) and their contribution to attracting and retaining skilled workers to the Northern Territory of Australia. Their results provided positive indications about the demographic, labour force and retention contributions of the programs.

A DIBP (2014) research paper investigated the critical success factors that facilitate migrant retention in regional communities, as well as the broader trends that might influence regional settlement patterns. A diverse range of studies have assessed where immigrants settle. Hatton and Leigh (2011) argued immigrants assimilate as communities, not only as individuals (i.e. they do not assimilate as atomistic individuals, but rather as specific immigrant communities.)


### 1.7 Structure of this report

The remainder of the report is structured into the following chapters.

Chapter 2: A framework to consider migration and productivity. This chapter sets out a broad framework for considering productivity, the factors that affect productivity and how migration might influence productivity.

Chapter 3: Measuring the productivity of individual migrants. This chapter sets out an explanation of the extent to which earnings, or other indicators, can be used as measures of individual migrants' productivity. It also reviews evidence on whether there is any wage discrimination against migrants, which would drive a wedge between wages and productivity for migrants.

Chapter 4: Migration, skills and productivity. This chapter examines trends in Australia’s productivity performance over the past four decades and, to the extent possible, relates migration trends to productivity trends. It includes analysis of the recent contribution of migration to the change in the skill composition of labour supply using the ABS's quality-adjusted labour input (QALI) framework. The analysis is based on differences observed between the 2006 Census and the 2011 Census.

Chapter 5: Migrant data analysis. This chapter reports the findings from the modelling of migrants’ productivity and employment. The details of the modelling and the full results are presented in Appendix 2. Productivity differences are modelled as wage premiums which are related to migrant/non-migrant status, visa class and various individual characteristics; and the probability of being employed, which is related to a similar set of characteristics.

Chapter 6: Connectedness and productivity. In this chapter, two of the underlying determinants of the productivity framework in Chapter 2, social capital and trade, are examined. The chapter explores how social networks and trust can influence economic outcomes and illustrates their importance for international trade, investment and innovation in the host countries with significant immigrant populations. This chapter includes a discussion of how, and to what extent, connectedness influences the economic outcomes for immigrant children in western settler societies.
followed by a general discussion on determinants of labour market integration of immigrant children.

Chapter 7: Data gap analysis. This chapter reviews the limitations of the existing datasets for measuring productivity differences between immigrants and native-born Australians, and identifies a potential set of datasets that can be collected to quantify different determinants of productivity outlined in the productivity framework in Chapter 2.

Chapter 8: Policies affecting migrant productivity. This chapter provides an overview of policies affecting the productivity of migrants to Australia compared to non-migrants. It covers the role of migration policy in determining the type of migrants (age, skills, country of origin) coming to Australia and the breadth of policies that might affect productivity post-arrival in Australia. The latter discusses the significance of the broader citizenship and multicultural policy environment.

Chapter 9: Conclusion. This short final chapter sets out some overall conclusions, the limitations of our analysis and a few suggestions for future research.

The appendices set out a description of the data used (Appendix A), the data analysis (Appendix B) and the Annotated Bibliography (Appendix C).
1.8 **Key point summary**

- This project has been undertaken as part of research services being delivered under the Memorandum of Understanding between the Australian National University and the Department of Immigration and Border Protection.

- The brief for the project was to explore the links between migration, mobility and productivity. We have developed a framework which conceptualises the links between migration and productivity (Chapter 2). The mobility of migrants is one of the factors that influence this relationship. The terms of reference for the project have guided the scope of the work.

- Migration to Australia is a major influence on our society and economy. Over time, the scale and composition of migration to Australia has changed dramatically. The main trends over the last few decades include:
  - An increase in overall numbers and a diversification of the countries of origin;
  - An increase in the proportion of skilled and business migrants compared to migrants coming for family reunification or on humanitarian grounds;
  - An increase in temporary migration and a corresponding rise in the proportion of migrants who progress to permanent migration from a temporary visa.

- Australia’s productivity drivers and growth have changed over time. Three periods are identified - the ‘baseline’ (1970s and 1980s), ‘surge’ (1990s) and ‘slump’ (2000s) periods of Australia’s productivity growth. Chapter 4 sets out the main factors that have led to changes in the trajectory of productivity growth.

- A survey of literature has informed the work of the project. Each chapter includes relevant literature. The summary explores the literature under four broad themes:
  - Understanding productivity and its links with migration
  - Migrant labour market outcomes, skills and education
  - Wealth, innovation and connectedness
  - Policy evaluation and debate
2 A FRAMEWORK TO CONSIDER MIGRATION AND PRODUCTIVITY

This chapter sets out a broad framework of factors that affect productivity and, within that framework, how migration can affect productivity. The framework provides a point of reference for the analyses undertaken in subsequent chapters.

While we place a strong focus on the productivity implications of migration, we acknowledge that migration brings many dimensions to the Australian community, especially in social and cultural spheres. All aspects need to be considered in any full assessment of migration. Nonetheless, in response to the terms of reference we focus only on productivity and do not explore the other important social and cultural dimensions of migration.

We start by explaining the concept and measurement of productivity and why productivity matters. We then outline a framework of productivity determinants, followed by a discussion of how migration can influence these determinants.

2.1 About productivity

Confusion about the nature of productivity seems to pervade public discussions. While it is a straightforward concept, productivity can be defined and measured in different ways.

2.1.1 What is productivity?

Productivity is about the efficiency of production of goods and services. It is the rate at which inputs to production are transformed into outputs of goods and services or, even more simply, the ratio of outputs produced to inputs used.

Inputs can be:

- labour—such as hours worked, skills and management capabilities;
- capital—the use of assets such as buildings, computers, machinery and infrastructure; and
- materials and services—such as electricity, components for manufacturing, office supplies and cleaning services.

Although there are different ways to define and measure productivity, it is best for the current purposes to think of it in terms of transforming quantities of inputs into quantities of outputs. Productivity is ultimately about using resources (production inputs) to deliver more and better-quality products. It is not about merely reducing financial costs.

Even so, ‘efficiency’ still has connotations for some of ‘making do with less’ or ‘working harder’. That may happen in some situations in the short-term. But it is important not to lose sight of the way in which major productivity gains are realised over the long term. The use of computers and more-sophisticated equipment, for example, means that today’s workers can produce far more output in a day than workers did a generation ago. From this longer-term perspective, technology, mechanisation, and digitisation mean we are working ‘smarter’ in raising productivity.

Innovation is a key avenue for productivity improvement. Innovation means producers do something different. They either produce new higher-quality products—product innovation—or they introduce
new ways of producing their goods and services—process innovation. Producers do not have to invent in order to innovate. They can pick up innovations that have already been introduced elsewhere or modify existing methods. The key point is that, by doing something different, they raise the efficiency of their production as measured by the rate at which they generate output produced from the inputs they use.¹

The productivity concept applies at all levels—firms, industries and national economies. We will come back to the ‘micro’ level of firms and individuals but, for the moment, let us consider productivity at the national level.

### 2.1.2 The importance of productivity growth

Productivity makes a large difference to the lives we lead. The central reason is that generating output also generates income.² If productivity growth means resources are used in ways that generate more output, those resources are also used in ways that generate more income.

Productivity, therefore, is a major source of growth in national income and prosperity. In fact, over the long term, productivity is the most important source of national prosperity. To illustrate this critical point, we introduce one of the productivity measures in common use. Labour productivity is the ratio of the output of goods and services produced to the quantity of labour input used. For the discussion here, we will take the measure of labour input to be the number of hours worked.

Now let’s look at sources of growth in Australia’s Gross Domestic Product (GDP) per capita. GDP is a measure of both the volume of output produced in an economy and the amount of income generated. Growth in per capita GDP is an often-used, albeit imperfect, indicator of growth in living standards. It can be broken down into contributions from growth in GDP per hour worked—a measure of output per hour worked or broadly-based labour productivity—and growth in labour utilisation—the ratio of total hours worked to the size of the total population.³

Figure 2.1 shows the annual average rate of growth in Australia’s GDP per capita over the past four decades, as represented by the height of the columns (and by a horizontal line in the case of the first column). The growth in GDP per capita is made up of two elements. The blue segments are the labour productivity growth contributions and the red segments are the contributions from change in labour utilisation.

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¹ Higher quality products count as an increase in output.
² With output defined as value added, a dollar of output is a dollar of income, which is shared between the owners of capital and those who supply labour.
³ Mathematically, GDP per person equals GDP per hour worked, multiplied by hours worked per person in the population.
The figure makes apparent that productivity growth has contributed most of the growth in Australian living standards in each of the last four decades. In fact, averaged over the entire period, productivity growth has accounted for very nearly all of the growth in Australia’s per capita GDP.

The contribution from labour utilisation shows that changes in participation and employment rates can also have a major influence on living standards in the medium term. Growth in labour utilisation contributed positively in the 1980s and 1990s decades, associated with an increase in female participation and a higher rate of employment respectively. The strong fall in labour utilisation in the 1970s was associated with a rise in unemployment.

Figure 2.1 omits a third factor that affects growth in prosperity—the terms of trade (the ratio of export to import prices). Australia’s terms of trade rose steeply from 2003 to 2011 and added substantially to the growth in real average incomes. This was essentially because exports of minerals fetched far more net income and, with cheaper import prices, the purchasing power of Australian incomes rose.

Labour utilisation and the terms of trade tend to have short to medium term effects. There is some ‘natural’ limit to how high hours worked per head of population can rise, aside from variations up and down. Similarly, while the terms of trade can have a major influence on the way up, as they did in the last decade, they can also fall as they have done since 2011.

Productivity growth may rise and fall, but there is no barrier to continued improvement in the level of productivity over the long term.

The terms of trade has an effect on real income that is independent of growth in the volume of output. By 2011-12, the rise in the terms of trade from 2002-13 meant that Australia’s real income, as measured by Gross Domestic Income, had grown 13 per cent more than GDP.
As Paul Krugman famously said, ‘Productivity isn’t everything, but in the long run it is almost everything’.5

Figure 2.2 summarises the key factors that affect national prosperity and wellbeing. While living standards are a central part of wellbeing, social capital and environmental capital are two other extremely important factors. Environmental capital includes amenity, biodiversity, land care and air and water quality. There are many dimensions to social capital, including social attachments, community involvement and social values. (The ABS publishes a range of well-being indicators6.)

There are many aspects and linkages that are not represented in the schema. Nevertheless, the idea is to put productivity into the broad perspective of being an intermediate objective that needs to serve higher objectives to improve living standards and, ultimately, community wellbeing. In other words, while productivity growth is vital to community objectives, it is not something that should be pursued at all costs.

Social capital will enter the discussion at various points in this report. For example, it will be mentioned in the productivity framework and later in the report in terms of connectedness.

Figure 2-2 Schematic representation of how productivity and other factors affect community living standards and wellbeing

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5 Krugman (1994).
6 ABS Cat. No. 1370.0 Measures of Australia’s Progress.
2.1.3 Types of productivity measure and relationships between them

We now introduce all three of the productivity measures in common use:

- labour productivity—the volume of output produced per unit of labour used;
  - as before, we define the unit of labour to be an hour of work so that labour productivity is output per hour worked;
- capital productivity—the volume of output produced per unit of capital used;
  - capital can be thought of as being assets such as buildings, roads, plant and machinery, equipment, land, and intellectual property;
  - capital input is the flow of services that these assets provide in producing output; and
- multifactor productivity (MFP)—the volume of output produced per unit of both labour and capital inputs used.

Each is a measure of the efficiency of production. They just differ in the way they focus on production efficiency and how they should be interpreted.

All three measures of productivity are useful indicators in different contexts. For example, labour productivity is a vital indicator in the context of influences on growth in living standards, as was demonstrated above. MFP is often favoured as a more-comprehensive efficiency measure because it takes explicit account of the use of both of the major inputs to production—labour and capital. MFP growth measures the influence of all the other factors that determine how well labour and capital are combined to generate output.

Given that this report focusses on labour productivity, it is crucial that its interpretation is clear. Figure 2.3 depicts a production relationship at the top of the figure. The level of MFP governs how much output is generated from inputs of labour and capital.

In the lower part of the figure, output is divided by the amount of labour used to establish labour productivity. The input side also has to be divided by the amount of labour used in order to preserve the relationship between output and inputs. Dividing labour by labour cancels it out and the ratio of capital to labour is left on the input side. The transformed production relationship states that labour productivity growth is a function of increases in the capital-labour ratio, often referred to as ‘capital deepening’, and improvements in MFP efficiency.

To explain these concepts further, take the case of a worker who has a hammer to construct wall frames. He or she will get a lot more frames made in a day of work if given access to a nail gun to replace the hammer. That would be capital deepening and it clearly increases labour productivity. Now suppose that with the more rapid rate of construction, the stock of wood to construct the frames runs out. The increase in labour productivity is not sustained. But, if the company introduces a new inventory management system that ensures the required wood never runs out, labour productivity would rise again. This time it is an MFP improvement since a better way of combining labour and capital has been introduced.
Both capital-deepening and MFP growth have been substantial contributors to Australia’s labour productivity growth. As is shown later in Chapter 4, capital deepening has accounted for about two-thirds of the labour productivity growth over the last 40 years, with MFP growth accounting for the other third.

2.2 A framework of productivity determinants

The productivity framework we outline should not be regarded as definitive. A definitive ‘roadmap’ of all the relevant ways to improve productivity does not exist. The economics literature on the sources of growth in output and productivity, though vast, tends to focus on various key determinants, rather than on the range of determinants.

Grouping determinants under three headings is one way to make a start.\(^7\) The headings are:

- **Immediate determinants**—factors that are within the control of producers of goods and services when they make their production decisions;
  - examples include the technology they use, the number of people they employ and the capital equipment they use;
- **Underlying determinants**, which are not within the immediate control of producers, but do affect production decisions and the scope of opportunities to lift productivity growth;
  - examples include advances in production knowledge—new technology and know-how—and the development of workforce skills through education and training; and

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\(^7\) This kind of starting point has been employed, for example, by the Productivity Commission (PC 2009) and the Australian Business Foundation (2012).
Fundamental determinants—factors that are difficult or slow to change, but nevertheless affect national productivity, perhaps more in the level of productivity than in the growth of productivity;
  o for example, climate and the availability of natural resource affect the relative importance of agriculture and mining in an economy and the productivity and income that can be derived through those channels; and
  o as another example, distance from large markets and sparse population settlement have traditionally limited the ability of producers in Australia to access some productivity opportunities that would come from large-scale operation.

The framework of determinants for this report is set out in Figure 2.4. It focusses on immediate and underlying determinants and on those factors that are potentially subject to influence from migration. Important immediate determinants are in light blue and selected underlying determinants are in light red.

The schema also depicts the policy and institutional environment, which can have many influences on productivity determinants. Policy and institutional influences are discussed later in the report.

The complex set of interrelationships between determinants is omitted from the schema in the interests of simplicity. It helps exposition to present the determinants in this ‘linear’ fashion, but there are many important interdependencies and feedbacks to consider in practice.

Because labour productivity appears in both diagrams, it provides a link between Figures 2.2 and 2.4.
2.2.1 Immediate determinants

Immediate determinants are factors that are within the control of producers to use in their production activities. For the moment, let’s consider productivity at the firm level.

We showed above in Section 2.1.3 that labour productivity growth stems from capital deepening and MFP growth. It follows that the amount of capital used (per unit of labour) is a major determinant of labour productivity growth.

Physical capital (as drawn in Figure 2.4) is included in the notion of capital deepening. It covers tangible assets such as buildings, machines, equipment and land. Some intangible assets can also be included, depending on measurement conventions. For example, the ABS now includes capitalised Research & Development and mining exploration expenditures within the scope of its measures of capital stock.

The other immediate determinants operate through the MFP channel. Conceptually, these are the factors that determine the rate of the firm’s innovation in products and processes.

Production knowledge covers the kinds of technologies that are used in production, such as robotics and automatic teller machines. It also covers management techniques, such as just-in-time inventory management and franchising. Taking up advances in knowledge represents innovation.
Human capital is another major determinant of productivity growth. Human capital comprises the skills, knowledge and experience that people have accumulated and that are useful to production activities in one form or another. It also covers entrepreneurial ability. Increased human capital means that the workforce is more capable of working with more complex equipment and production processes that generate productivity improvements. Certain skills also help determine the rate of innovation in a firm.

While human capital is embodied in people, it is not included in this framework as part of labour input because labour input has been defined simply and solely as hours worked. The effect that human capital has on output growth, therefore, shows up in MFP growth.

In terms of intangibles, relatively recent research has shown the importance of investment in intangibles as a way of tapping into the firm-level dynamics of productivity growth. In a fast-changing world where production is subject to global pressures and rapid change in technologies, it is the firms that can adapt quickly and respond to new opportunities as they arise that are better able to improve productivity.

Intangible investments have a number of dimensions that include information bases such as big data, ways of tapping into customer wants, experience in early innovation, intellectual property, flexibility in work arrangements and structures, brand awareness and loyalty and organisational capital. Organisational capital is firm-specific knowledge derived from the firm’s processes, systems, structures and cultures to promote better performance through organisational capabilities, learning and adaptation.

These immediate determinants overlap and are interdependent. Just as one example, technological knowledge is often embodied in physical capital, but requires people with specialised skills to access it and bring it in to productive use in production.

### 2.2.2 ‘Collective’ productivity and the allocation of resources

Innovation—doing something different—is a prime source of productivity improvement for firms. Extrapolating, the more firms innovate and the more innovating firms there are, the more productivity will improve, it would seem, in broad industry groupings, and in the economy generally. While that is largely true, it is not the full story. There is another set of mechanisms that links firm and national productivity.

First, new firms enter markets and some firms exit, which will raise the average productivity across firms if the new starters are more productive, or soon become so, and the poor-performing exiting firms are less productive. There is empirical research to back this proposition. There is a wide variety of productivity levels across firms, even within the same narrowly-defined industry.

Second, the more-productive firms can grow in size and capture more market share, by passing on productivity gains in the form of lower prices to their customers, or more-productive firms can take over other firms and introduce better practices or gain from synergies through merger. Again this will raise the average productivity across firms.
These ‘collective’ productivity improvements can occur without improving productivity within firms, although they are sometimes intertwined. The ‘dynamics’ of firm behaviour can be a very important influence on broader industry and economy-wide productivity.

In other words, it matters which firms attract the production resources. Industry productivity depends on whether the most-productive firms attract more or less of the available inputs to commit to production. Because productivity levels vary across industries, it also matters for national productivity which industries get more or less of available production resources. This notion of how available production inputs are distributed across firms and industries is often referred to as the ‘allocation of resources’.

A very important, but subtle, point is that the allocation of resources can affect industry and national productivity, yet the allocation of resources should not be driven entirely by the pursuit of improved productivity. Consider the absurd example of devoting all the nation’s resources to high-labour productivity mining, while neglecting low-productivity services like health, education and restaurants. The allocation of resources should be determined according to where the most value can be generated. To a large extent, prices reflect value and perform the allocation role, but sometimes government interventions are needed to ensure resource allocation reflects broader community notions of value.

The important point to take away is that, while national productivity does depend on the productivity of individual firms and the dynamics of firm behaviour, maximising productivity is not the ‘end game’. The allocation of resources should reflect broader notions of where and how the most value can be generated with available resources.

A parallel issue with balancing individual productivity and the allocation of labour input comes up later in regard to migration.

### 2.2.3 Underlying determinants

We turn now to the underlying determinants shown in light red in Figure 2.3.

Given that capital deepening is so important to labour productivity growth, sources of funds for capital investment are crucial. Domestic savings and foreign capital (foreign direct investment and loans) are the two channels.

Infrastructure, which also requires substantial funding, provides a platform for businesses to operate more efficiently, by facilitating transactions, communications, energy use and transport. The innovation system—a research infrastructure provided through the agglomeration of private, government and university research agencies—can also be placed under the infrastructure heading. The innovation system provides support for firms to develop and adapt technologies suited to their business strategies.

The health and education systems provide support for people in their work, as well as many other aspects of their lives. The education system is central in fostering many skills and acquired attributes that people are able to bring into their work lives. The skills and attributes help raise productivity not only directly in production work, but also, for example, in the development of new knowledge,
intangibles and broad social capabilities. The health system, amongst other things, helps ensure that people are able to engage productively in their work lives.

International trade can help improve productivity. Some imported goods and services, such as computers, may provide ‘spillovers’ to the domestic economy through the technologies that are embedded within them. Developing export markets can provide local producers with opportunities for economies of scale or even to learn from production practices in other markets.

While productivity is a supply-side concept, the strength and pattern of demand has an influence on productivity outcomes. Strong demand provides growth in production, which can assist productivity growth, be it through scale or entrants into the market with better business models. The structure of demand can also influence the allocation of resources and the industry mix of production. To the extent that industries have different productivity levels, changes in industry proportions will affect average productivity.

Social capital has many dimensions and has influence on many aspects of life. Here, we highlight the aspects of social cohesion and inclusion, cultural attitudes and practices. Social capital is discussed in greater depth in Chapter 6.

The business environment refers to the set of rules and conditions under which firms operate. In general, a relatively stable business environment helps to provide conditions under which businesses are prepared to make large long-term investments.

The formal ‘rules of the game’ for business are, to a large extent, established by policy and institutional settings. Taxes, regulation, governance arrangements and the strength of competition can influence the motivation that businesses have to improve their productivity performance and the ways in which they are able to go about it. They can also influence the allocation of resources. The industrial relations framework can affect the degree of flexibility firms have to adjust their business models. An effective system for defining and enforcing property rights (for example, over land use, intellectual property or market exclusions) will affect investment risks, but will also help to settle what can and cannot be done (including, for example, in regard to environmentally-sensitive proposals).

Policy and institutional settings influence the range of underlying determinants, a fact which underscores the diverse, complex and indirect ways in which governments have to operate if they are to influence productivity in a positive way. There are no direct ‘policy levers’. Governments need to formulate and maintain a consistent set of productivity-enhancing policies with a view to the long term. The productivity payoffs from policy initiatives come with some uncertainty on both size and timing. The strong evidence is that the payoffs come in small increments at the national level, from combinations of policy settings, rather than single measures, and over time, rather than the immediate term. There is no ‘silver bullet’.
2.3 The effects of migration

A key message from the discussion so far is that the influences on productivity are many and they operate in complex, interrelated and interdependent ways.

Now we turn to the influences of migration on productivity, which are certainly no simpler. There are many possible effects, which are difficult to pin down in terms of importance. Context and interrelationships mean that very often the phrase, ‘It depends on...’ has to be used.

2.3.1 The big picture

The economic costs and benefits of migration have been much explored and debated both in Australia and overseas. If there is a consensus, it is that the net economic effects are positive, but not large overall. But that too can be debated, particularly as labour markets, economies and migration programmes vary widely between countries.

The ‘counterfactual’ comparison is part of what makes the assessment vexed. Is the comparison between a net migration intake of 250,000 and an intake of 100,000? Or is the comparison between a decade or even a generation of migration and the case of no migration at all?

In relation to productivity, the effect of migration on the capital-labour ratio is seen as crucial. If there is not commensurate growth in capital, the labour-boosting effect of migration leads to a lower capital-labour ratio, all other things being equal. As we have seen, lower capital deepening would mean lower labour productivity growth.

The argument then runs that wages growth would be less because wage rises tend to align with productivity growth (see Chapter 3). This would make existing workers worse off than they would be without the migration. The owners of capital, who pay for the labour, on the other hand would be better off.

A further argument is that this effect would be temporary. The increase in returns to capital would induce further investment and restore the rate of capital deepening. Labour productivity would return to where it would have been and wages and average incomes would be restored. The economy would just be bigger.

This is, of course, an ‘ideal’ economy and so a lot of discussion surrounds the extent to which this path would be followed in practice. The numbers of migrants and the ability of labour markets to absorb them and the extent and pace with which capital responds become key issues.

Attention is also turned to the specifics of migrants’ needs and desires and the lasting effect migration may have on productivity. For example, additional market demands from migrants for some products could open opportunities for economies of scale and different demand patterns can affect the allocation of resources, which could have a positive or negative effect on productivity.

More migrants could also put more pressure on infrastructure demands, leading to more congestion and poorer service until further investment is made. A question then is whether that is the most productive investment in a long-run sense. Additional need for social supports, while appropriate, may divert resources from more-productive activities. On the other hand, healthy and educated
migrants would place relatively small demands on the education, health and welfare systems, especially if their stay is limited in duration.

Another approach looks at migration from a ‘job matching’ perspective. This sees migration as an alternative or complement to skill formation in the domestic population and sees it as more responsive in the short term to demands for specific skills. Migrants can also be more flexible in meeting demands for labour in certain regions and more mobile as economic circumstances change. In these instances, migration would promote productivity, at least in the short term. It would mean that available production capacity is more fully utilised.

These are just some of the considerations in the background as we look at how migration might affect the determinants in the productivity framework.

2.3.2 Influences of migration on broad factors affecting prosperity

Before looking at the productivity determinants, however, it is worth mentioning ways in which migration can influence prosperity through the other channels depicted in Figure 2.2. Productivity is not the only way to improve prosperity. As shown above in Section 2.1.2, an increase in labour utilisation (hours worked per head of population) is another possibility.

Growth in the number of hours worked in the economy can be decomposed into a number of separate components:

- population growth
- changes in the proportion of the population of working age
- changes in the participation rate (the extent to which people of working age are active in work or looking for work)
- changes in the employment rate (or unemployment rate)
- changes in average hours worked (for example, increased prevalence of part-time work).

The rate and structure of migration can have an immediate, as well as a longer-term, effect on population growth and the proportions of the population of working and child-bearing age. There can also be differences between migrant and non-migrant populations in participation rates, employment rates and hours worked depending on, for example, motivation (migrants are sometimes characterised as having higher participation rates and working longer hours) and culture (for example, the participation rate of married women).

2.3.3 Potential influences of migration on immediate determinants

The roles that migration can play in influencing the immediate determinants are now discussed briefly. Our intent is to explain the linkages, rather than signal their importance. The importance of some of the linkages in the Australian context is investigated in the rest of the report.
As a general point, the influence that migration has in practice depends on the size of the migration programme relative to the existing population, the selection of migrants and the visa category under which they enter. In the short to medium term, the conditions in local labour markets will also determine the extent to which migrants have the opportunity to contribute to their desired extent.

The influences that migration can have are summarised in Table 2.1.

**Table 2-1 Potential effects of migration on immediate determinants**

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Sub-category</th>
<th>Potential migrant effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human capital</td>
<td>Skills</td>
<td>Add skills Alter skill mix Fill skill shortages Transferability of qualifications English and foreign language fluency</td>
</tr>
<tr>
<td></td>
<td>Experience</td>
<td>Add relevant work experience</td>
</tr>
<tr>
<td></td>
<td>Tacit knowledge</td>
<td>Specialist knowledge for production Management capability Specialist knowledge for development and application of technologies</td>
</tr>
<tr>
<td></td>
<td>Entrepreneurship</td>
<td>Flair, ideas, contacts and business acumen</td>
</tr>
<tr>
<td>Physical capital</td>
<td></td>
<td>Temporary stays can supplement domestic labour and speed completion of large-scale capital-formation projects</td>
</tr>
<tr>
<td>Intangible capital</td>
<td>Flexibility</td>
<td>Prepared to undertake range of tasks Geographic flexibility and mobility</td>
</tr>
<tr>
<td></td>
<td>Organisational capital</td>
<td>Experience in organisational change Knowledge of useful systems, structures</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Technology</td>
<td>Tacit and complementary knowledge and ideas Experience in Research &amp; Development and commercialisation of ideas Spillovers migrant and non-migrant populations</td>
</tr>
<tr>
<td></td>
<td>Management</td>
<td>Business and management expertise</td>
</tr>
</tbody>
</table>

On human capital, migrants bring skills and experience that add to the pool of skills and change the mix of skills in the domestic workforce. Migration can be a way to alleviate skill shortages relatively quickly and to handle skill shortages that may only be temporary. Some migrants can bring highly specialised skills, for example, in management, entrepreneurship, professions and the development and application of technologies that assist productivity improvement. However, the transferability of skills, recognition of qualifications gained in other countries and lack of fluency in English can be impediments to how easily migrants transition into the local work environment. On the other hand, their fluency in their home language can assist linkages between Australia and the home country.
that foster trade, collaboration and the transfer of knowledge and foreign funding (which are underlying determinants in the productivity framework).

Migrants can play an important role in capital formation through the design, planning and construction of large-scale projects, with the Snowy Hydro Scheme being the best-known example. More recently, temporary immigrants contributed to the more-rapid completion of mining projects in the mining boom, as a shortage of skills in the domestic population constrained the ability to undertake and complete projects.

Immigrants can assist the development of intangible assets. They can bring ideas, experience and acumen that help businesses develop greater dynamism, such as responsiveness to international trends and emerging technologies. They may have experience of the organisational changes and the systems and structures that overseas firms have introduced in transforming themselves. Immigrants can also assist change by being more flexible in the range of tasks they are prepared to undertake and in the parts of the country they are prepared to locate. That flexibility can also be important over time, if migrants are more job and geographically mobile, as economic circumstances and production patterns change.

Immigrants can play a role in the development and application of knowledge. This may not only have direct benefits, but may also have ‘spill-over’ benefits to migrant and non-migrant populations. That is, technological and management knowledge, leadership and ability spill over in various ways to others.

2.3.4 ‘Collective’ productivity and resource allocation

Key to the discussion of the productivity framework is that there are complexities in the relationship between firm-level productivity and higher-level productivity for industries and the economy at large.

There are similar complexities in regard to migrants.

The productivity of an individual exists only in terms of the job(s) they actually perform. This is discussed at length in the next chapter, but we have encountered the example of a construction worker whose productivity depended on the capital available and the surrounding organisational arrangements. Individuals have human capital that predisposes them to some potential productivity. But the actual productivity of migrants will depend on their ‘allocation’ to specific jobs.

Ideally, migrants would be allocated in some way to the more productive jobs, commensurate with their skills, either by the wages and conditions on offer or by some other mechanism. Or at least they should not be prevented from going to jobs where they can be productive and commensurately rewarded. There would be a problem if well-qualified and experienced migrants were somehow going to firms that had relatively low productivity and were in decline.

On the other hand, once again productivity is not the only consideration. While the migration programme obviously needs to pay a lot of attention to skills, there may be some low-skill jobs that are in demand and cannot be filled locally.
Migration has an obvious role in filling skill shortages. The merits of using temporary migration as a way to fill short term needs are clear. Nevertheless, if short-term migration is used continuously, it may undermine sensible strategies to develop skills locally.
2.3.5 Underlying determinants

Migrants can also influence the underlying determinants of the productivity framework. Table 2.2 provides a summary.

### Table 2-2 Potential effects of migration on underlying determinants

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Potential migrant effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savings</td>
<td>Bring additional savings, Remittances to home country</td>
</tr>
<tr>
<td>Foreign capital</td>
<td>Facilitate linkages to sources of funds in home country</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Add demand and scale, Add to congestion</td>
</tr>
<tr>
<td>Health &amp; education systems</td>
<td>No effect (aside from labour supply, considered above)</td>
</tr>
<tr>
<td>Trade</td>
<td>Facilitate export and import linkages with home country</td>
</tr>
<tr>
<td>Demand</td>
<td>Add thickness to domestic markets, Changes in demand patterns, Assist in scale and agglomeration effects</td>
</tr>
<tr>
<td>Social capital</td>
<td>Cohesion and inclusion effects, Work attitudes and motivation</td>
</tr>
<tr>
<td>Business environment</td>
<td>Add to labour market and product market competition</td>
</tr>
</tbody>
</table>

Depending on intended length of stay, immigrants can bring their accumulated savings. This would be more the case for migrants intending to become permanent residents, whereas temporary and newly-arrived immigrants are more inclined to send some of the money earned locally back to their home country.

On foreign capital, migrants may be able to foster links with other pools of finance from their home countries. This is a part of the ‘international connectedness’ often discussed (see Chapter 6).

Migrants add to the demand for infrastructure. This may have the benefit of adding scale to the provision of infrastructure services. On the other hand, more immigrants can add to congestion which would be a negative for domestic productivity. Migrants can also assist in the development and application of technologies that are part of, and may strengthen, the innovation system.

It is not immediately obvious that migrants influence the productivity-related output of the health and education systems, except in the human capital dimension of filling shortages and bringing specialised skills and attributes that can improve the quality of outputs.

On trade, migrants can foster contacts with foreign countries that help to expand import and export markets. Again, this is part of international connectedness.

Migrants add to the overall strength and pattern of domestic demand.
In regard to social capital, migrants can often be well-motivated towards work and achievement, both for themselves and for their children. There can also be tensions between migrant and non-migrant communities; and migrants can also feel some isolation, prejudice and exclusion. These, in turn, could undermine productive engagement in work activities.

Regarding the business environment, migrants may add competitive pressures both in labour markets, through added supply of workers with skills in demand, and in product markets, through the businesses they start and help to develop.
2.4 Key point summary

- Productivity is the rate at which quantities of inputs are transformed into outputs of goods and services. It is about the efficiency of production.
- Innovation—doing something different with what is produced or how it is produced—is the main way that firms improve productivity.
- Productivity is a concept that can be applied at many levels—individuals, firms, industries, regions and national economies. These different levels of analysis are interdependent. Some care is needed, however, in viewing national productivity growth as simply a sum of innovation in individual firms.
- At higher levels, such as industries or the economy, the entry and exit of firms and more rapid growth by the more-productive firms can improve productivity.
- Productivity growth matters because it is central to improvements in living standards.
- Labour productivity is the amount of output produced per unit of labour input, which is usually measured by hours worked.
- Multifactor productivity is the amount of output produced per unit of input of labour and capital. MFP growth is an indicator of the influence of all the factors that determine how effectively labour and capital combine to produce outputs.
- Labour productivity growth comes from capital deepening and multifactor productivity growth.
- Immediate determinants of productivity are within the operating sphere of producers. They can decide what to invest in and to use in production.
  - Major immediate determinants are physical capital, intangible capital, human capital and production knowledge.
  - Migrants can add to the effectiveness of these determinants. They most directly affect human capital by adding to the pool of skills and experience, altering the skill mix and relieving skill shortages. They can also influence the other immediate determinants.
- Underlying determinants are not within the immediate control of producers, but do affect production decisions and the scope of opportunities to lift productivity growth.
  - Major underlying determinants that can affect productivity include funding for capital investments, the health and education systems, the nature and quality of infrastructure, international trade, the business environment, social capital and the strength and pattern of demand.
  - Migration can have a multitude of effects on underlying determinants.
- Governments can only operate indirectly in seeking to raise productivity performance through the policy and institutional settings. The timing of productivity payoffs is uncertain, but is generally a long time.
- The nature and magnitude of migrant effects on productivity depends on the size of the migration programme relative to the existing population, the selection of migrants and the visa category under which they enter. The ‘allocation’ of migrants to jobs, by whatever mechanism, also matters. In the short to medium term, the conditions in local labour markets will also determine the extent to which migrants provide what they have to offer.
3 MEASURING THE PRODUCTIVITY OF INDIVIDUAL MIGRANTS

In this chapter we explain how earnings, or other indicators, can be used as measures of individual migrants’ productivity. First, we discuss the need to view individuals’ productivity in the context of the work they actually do. Conceptually, it is not possible to measure individuals’ productivity by sole reference to personal characteristics.

Second, we review work-related measures of productivity. Essentially, wages or labour costs are the only practical measures of individuals’ productivity. Based on a literature review, we assess the extent to which (relative) wages reflect (relative) productivity.

Finally, we focus specifically on migrants and review evidence from empirical studies as to whether there is any wage discrimination against migrants, which would reduce the extent to which their wages would reflect their productivity.

The conclusions reached in the chapter are relevant to the quantitative modelling in Chapter 5, because the analysis there is based on the assumption that wages can be used as an indicator of productivity.

3.1 Productivity has to be viewed in the context of production

Labour productivity is the relevant concept to consider in relation to the productivity of individuals. Labour productivity is the amount of output produced per person or per hour of work.

The productivity of individuals can be thought of as stemming from:

- the innate characteristics of the individual, which include attributes such as talents, intelligence, flexibility, aptitude, physical size, extroversion and determination;
- acquired characteristics, such as education, tacit knowledge, physical strength, interpersonal skills and work experience; and
- the characteristics of production in the firms in which individuals work;
  - for example, the previous chapter illustrated the importance of technology, capital intensity and management capability.

The productivity of individuals with different innate and acquired characteristics can really only be assessed in the context of the work they do. For example, a person with high physical strength is likely to generate more output in manual work than an individual with low physical strength, but would not necessarily do any better at clerical work than a low-strength individual. Similarly, the value of the output produced by a tertiary graduate is likely to be much greater if he or she is working as a skilled worker in their field of qualification than as an unskilled retail assistant.

More fundamentally, the work context is crucial to individuals’ productivity because of the various forms of productivity ‘leverage’ they are provided in production. The point can be easily illustrated by comparing the workers of today with those of (say) a generation ago. Today’s workers are far more productive—they generate more output per hour worked—because they have so much more capital and technology at their disposal. Many workplaces now achieve the same or greater output
with fewer people, but with more capital and more-sophisticated equipment and digitisation of processes. Even improvements in the quality of management have made a difference to the amount of output staff can generate.

The productivity of individuals at a point in time also depends on the characteristics of firms and industries in which they work. For example, labour productivity of the average worker will be higher in mining, because of the industry’s high capital intensity, compared with retail or even manufacturing. Moreover, there can be wide variations in productivity across firms, even within the same narrowly-defined industries, due to different production structures and innovation strategies.\(^8\)

The importance of the work context means that, while it may be possible to measure some personal characteristics that influence individuals’ potential productivity in a broad sense, and with all other things held equal, it is not possible to measure their actual productivity directly. This is because measures of actual productivity with any accuracy are not possible without reference to the type of work they do and even the production characteristics of the firm in which they work.

Forbes et al (2010) noted this measurement difficulty in a study of the effects of health and education on productivity:

* Labour productivity could not be directly measured, because to do so would require detailed data on individuals and their employers, including their access to capital and other inputs. (p. xiv)*

Similarly, van Briesebroeck (2010) noted in relation to studies of individual productivity,

* Employee surveys do not contain information on firm-level output and inputs, necessary to assess productivity. (p.1333)*

Thus, the most common and practical way to assess the productivity of individuals, given all the difficulties in taking account of productivity variations at the industry, firm and even regional levels, is to use wages as a proxy measure of labour productivity.

### 3.2 Wages and labour productivity

The potential to use wages as an indicator of labour productivity is based on the economic theory that the marginal revenue product (the additional revenue gained from the additional output generated by employing an additional unit of labour) is equal to the marginal cost of the additional unit (the wage payable).

As an example, let’s say a farmer employs an additional fruit picker for 8 hours. The additional worker picks 32 kilograms of fruit which can be sold at 5 dollars per kilogram. That is 160 dollars of additional revenue, which equals the marginal labour cost at the hourly rate of 20 dollars.

Note that the wage considered in this context is the cost of labour from an employer’s point of view. That is, it is the rate of labour compensation, which includes all on-costs (workers’ compensation

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\(^8\) The heterogeneity in firm performance has been illustrated in many micro studies. See Bartelsman and Doms (2000) and Syverson (2011) for overviews of firm-level analyses.
premiums, superannuation contributions and so on), as well as the direct wages (before tax) that employees receive.

That the marginal revenue from employing additional labour equals the marginal cost is an equilibrium condition. If the marginal revenue per unit of labour was above the marginal cost per unit of labour, a firm would generate more net income from hiring yet another worker. It would be sensible for a profit-maximising firm to keep hiring until this was no longer the case. For example, if the additional worker picked 40 kilograms of fruit in 8 hours, it would make sense for the grower to keep hiring more pickers until the average output of the additional pickers fell to 32 kilograms. The marginal revenue per unit of labour would again equal the marginal cost.

The same would happen in the converse case if the marginal revenue were below the marginal cost when it would be in the firm’s economic interests to reduce employment until marginal revenue equals marginal cost.

This equilibrium condition can be equivalently expressed as the additional output per unit of extra labour (which is marginal labour productivity) equals the extra real wage costs incurred. The only difference made to the previous relationship is that the marginal revenue per unit of labour is divided by the output price—resulting in a measure of the additional real output per unit of labour—and the marginal cost of labour is also divided by the price of output—resulting in a measure of the additional real wage per unit of labour.

These relationships are also taken to hold in terms of averages, sometimes expressed at industry or economy-wide levels. That is, the average revenue product of labour will equal the average nominal wage of labour, and the average product of labour (average labour productivity) will equal the average real wage. The ‘representative firm’ behaviour is taken to apply at the industry or aggregate level.

In practice, however, there are various distortions that that might fracture a tight nexus between wages and productivity. As van Biesebroek (2010) observed:

\[
\text{In the real world, there are frictions, unobservable characteristics, adjustment costs, erroneous expectations, and maybe discrimination; all of which can distort the market equilibrium away from efficient allocation.} \quad \text{(p. 1333)}
\]

Other possibilities include long-term implicit contracts between firms and employees regarding pay deferment over a career cycle (Lazear 1979) and ‘efficiency wages’ in which firms pay a wage premium in order to induce greater work effort (Shapiro and Stiglitz 1984).

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9 With diminishing returns, adding more labour would lower the MRPL and, with inelastic labour supply, increased demand for labour would also raise the wage and MCL. Firms would continue employing more labour until the MRPL equals the MCL.

10 There will be inter-industry differences in wages in equilibrium. Since wages are determined more by occupational or skill levels, average wage differences can emerge between industries because of different skill mixes. Short-run shortages in industries, such as in a mining boom, can also change industry wage relativities.

11 This involves payment below productivity levels for young workers and payment above productivity levels for older workers.
Empirical approaches

A standard way to test the wage-productivity relationship has been to attempt to explain wage variations according to worker characteristics normally associated with productivity. Relevant characteristics include age, gender, educational attainment, work experience and occupation.

A further step has been to incorporate productivity explicitly into the quantitative analysis. A wage equation is still estimated to try to explain the dispersion of wages in terms of various worker characteristics, but a production function is also included to try to explain variations in labour productivity according to the same characteristics. Comparisons are then made to test the equality of the wage and productivity premiums associated with the various characteristics. This approach provides greater clarity on the extent to which the worker characteristics promote productivity, as well as wages, and the extent to which relative wages reflect relative productivities.

Hellerstein, Neumark, and Troske (1999) are widely credited with pioneering this wage-productivity equations approach. Analysis is ideally based on observations of individual employees and individual firms in linked employer-employee datasets (LEEDs). In the absence of LEEDs, workers have been assigned to firms through statistical matching techniques. There is much closer observation of wages and productivity from individual people and workplaces in this linked employer-employee approach.

There are also a few studies which use direct measures of individuals’ on-the-job performance. Medoff and Abraham (1980, 1981) get the credit as leaders of this approach in which performance is measured by supervisors’ assessments. The approach can usually only be applied on a micro scale (one or two firms), where performance ratings are recorded and researchers’ access is granted.

Main findings

The main message from the body of empirical work is that, for developed nations, wage variations across groups do largely reflect labour productivity variations. Where wage and productivity premiums are estimated and compared, they tend to agree (van Biesebroec 2010). However, it is also true that the exact extent of alignment is often clouded by a lack of precision in estimates.

Characteristics which have shown reasonably close alignment of their effects on wages and their effects on productivity include age (Hellerstein, Neumark and Troske 1999, Aubert and Crepon 2006, van Ours and Stoeldraijer 2011), educational attainment and experience (Haegeland and Klette 1999, and Chevalier, Harmon and Walker 200212), occupation, race and marital status (Hellerstein and Neumark 2007). Some of these effects are now discussed.

Discrepancies in alignment between wage and productivity effects depend in some cases on the country being examined. With different institutional arrangements and customs across countries, some variation in how various characteristics jointly affect wages and productivity can be expected.

Wages and productivity are commonly observed to increase with age, but only up to a point. Studies differ on when productivity starts to decline. In surveying the literature, Skirbekk (2003) settled on

12 However, Hellerstein and Neumark (2007) found wage premiums were 15 per cent below productivity premiums for US workers with some college education.
50 years old as the turning point. Some supporting Australian evidence for this finding is presented in Chapter 4.

Departures from a wage-productivity alignment by age have been found. Some studies have found older workers to be overpaid, relative to their productivity, and young workers to be underpaid. Nevertheless, the empirics on the existence or not of age discrepancies have not been entirely settled (Dostie 2011).

There is mixed evidence on gender. Hellerstein, Neumark and Troske (1999) and Hellerstein and Neumark (2007) found a gender bias against women in US studies, while no gender bias was found in studies of France, Israel and Norway (van Briesebroeck 2010).

Educational attainment has generally been found to have a positive effect on wages and productivity. There is a causality question, however, as to whether added human capital generates productivity improvements that are reflected in wages or whether wages are used as a signalling device for employers to pick more productive workers. Chevalier, Harmon and Walker (2002) found in favour of the human capital view.

**Evidence for Australia**

The ability to explore the links between individual productivity and pay is hampered in Australia by the absence of linked employer-employee datasets.

Coelli, Fahrer and Lindsay (1994) find that, among OECD countries, Australia shows a relatively high degree of correlation between wages and productivity across industries.

Barón and Cobb-Clark (2010), conduct an analysis of the gender pay gap in Australia using data from the Household Income and Labour Dynamics in Australia (HILDA) survey. They find that, in private sector employment, most of the median gender pay gap can be attributed to the differences in characteristics, especially for low-paid workers, but not for the highly-paid.

### 3.3 Immigrants’ wage disadvantage

The ability to proxy productivity by wages could be weakened in relation to migrants if there were discrimination against migrants in labour markets. Wage discrimination—payment of wages below productivity—could arise in two ways. First, discrimination in the engagement of migrants could mean they are relegated to lower-paying jobs that do not take full advantage of their productivity-related characteristics and qualifications. Second, they could be employed in jobs that do take advantage of what they have to offer, but are paid less than equivalents from the non-migrant majority.

It is important to note that payment of wages below their non-migrant majority counterparts—a wage penalty or disadvantage—does not necessarily indicate discrimination. A wage penalty can reflect differences in productivity. For example, even though an immigrant and a non-migrant may

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13See van Ours and Stoeldraijer (2011) or Doste (2011) for an overview of major studies. See also Cataldi, Kampelmann and Rycx (2012) for a Belgian study and Ilmakunnas and Maliranta (2005) for a Finnish study that find young (old) workers are underpaid (overpaid).
be equivalent on a number of characteristics including educational attainment, they may differ on relevant work experience or language proficiency. Wage discrimination occurs when there is a pay difference that is unrelated to differences in productivity.

Empirical studies do not focus explicitly on labour compensation, rather than wages received—or they implicitly assume that on-costs are a constant percentage ‘mark-up’ that does not distort wage relativities. However, there could be additional administration and training costs associated with migrants that are not taken into account.

The OECD (2013) reviewed evidence on different forms of discrimination against migrants, including in labour markets. ‘Field experiment’ studies over 15 countries and 20 years showed significant discrimination against migrants. The one Australian study (Booth, Leigh and Varganova 2011), however, showed no discrimination toward Italians which, along with other country evidence, was extrapolated to suggest that minorities from high-income OECD countries experience lower rates of discrimination. There is some evidence from some countries of greater discrimination against low-skilled applicants, in regard to jobs in the private sector, and when employment demand is weak.

In reviewing evidence from self-report studies, the OECD found that immigrants from high-income OECD countries rarely reported discrimination, but that, otherwise, men were more likely than women to report discrimination. Younger migrants were more likely to feel discriminated against than older migrants.

The OECD also reviewed studies of ‘ethnic penalties’—differences in unemployment and wage rates for migrants compared with the majority non-migrant population. It highlighted an international study that showed relatively low ethnic penalties in unemployment rates in Australia. Indeed, it found a positive premium effect for Italian and Chinese offspring born in Australia, but a negative penalty effect for Lebanese offspring.

Overall, the OECD found that ethnic penalties were smallest in OECD countries such as Australia, Canada and the United States that were settled by migration.

In another international comparison, Dustman and Glitz (2011) characterised Australia, along with Canada and the UK, as having a high-skilled foreign-born population. They found that Australia was an exception among all the countries studied in having a median wage for foreign-born workers that was higher than non-migrant workers. Further evidence on migrants’ relative wages is presented in Chapters 4 and 5 of this report.

**Australian studies**

Hahn and Wilkins (2013) used data from the HILDA survey on whether respondents believe that they have suffered different forms of discrimination, and the characteristics of those who believe they have been discriminated against. They find little evidence of perceived wage discrimination and,

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14 A common example of a field experiment is to submit equivalent applications and compare the call-back rates to people with foreign-sounding names to those with majority-sounding names.

15 The Australian study did find discrimination against job candidates with Chinese and Middle Eastern names.

16 The OECD noted that differences due to language fluency (for example) should not be attributed to discrimination.
holding other traits constant, ethnic and religious minorities are not significantly more likely to perceive they have been discriminated against.

On the other hand, Janunkar et al. (2004) find evidence of employment discrimination against Asian men, but only a temporary disadvantage for Asian women.

In reviewing the Australian literature on wage penalties, Breunig et al. (2013) note that most studies find that migrants from non-English speaking countries earn less than their Australian counterparts, but those from English speaking countries have similar earnings to non-migrants. A few studies have even found that migrants from some English speaking countries earn more than comparable Australian-born workers.

Explanations for wage gaps have been found in the form of frictions in the international transferability of human capital, English language fluency, labour market conditions in Australia at the time of migration, and age at migration. There is evidence that the income of immigrants increases with duration of residence, although one study found little or no earnings assimilation for immigrants from non-English speaking countries. Generally, studies find second generation migrants suffer no wage gap or any wealth disadvantage.

Through their own quantitative analysis, Breunig et al. (2013) find a wage gap for immigrant men from English speaking backgrounds, in contrast to previous studies. They control for unobserved migrant characteristics which seem to support a finding that immigrants who arrived before 1985 faced a larger wage gap compared to native-born Australians than subsequent cohorts. Confirming other research, they find wage gaps for immigrant men and women from non-English speaking backgrounds. Wage assimilation occurs slowly for all groups, but is slowest for those from non-English speaking backgrounds.

Cai and Lui (2012) also find evidence of wage gaps for migrants to Australia. Nevertheless, they find immigrants from English-speaking countries are favoured in terms of productivity-enhancing characteristics in comparison to Australian-born natives, and are also favoured in terms of returns to those characteristics. In contrast, men from non-English-speaking countries were found to suffer a wage gap with any advantage on characteristics offset by lower returns to those characteristics. Females were found to be slightly advantaged on average, with the advantage at the upper end, but with disadvantage at the lower end, of the wage distribution.

Islam and Parasnis (2014) find immigrants have a wage advantage, although at a more-disaggregated level blue-collar workers suffer a wage disadvantage. Overall, the wage advantage of migrants reflects their superior labour market characteristics and, in particular, their levels of education. They also find migrants receive lower returns for their education, and that English language proficiency plays an important role in wage differences by country of origin.

**Conclusion**

Wage differences between migrants and non-migrants are common among advanced countries. The extent of wage differences, however, is not a reliable indicator of the extent of wage discrimination. At least part of the differences can be explained by differences in productivity-related characteristics.
By international standards, migrant wage disadvantages are small in Australia. In fact there is evidence of migrants being paid more than the Australian-born. This reflects high education and skills and applies especially to those from English speaking countries.

There is also only limited evidence of wage discrimination against migrants to Australia.

Where there are wage gaps, they can generally be explained by lack of English fluency, difficulties in the transferability of qualifications and experience, age at migration and labour market conditions in Australia.

The overall conclusion is that wages can generally be used as a productivity indicator for both migrants and non-migrants.
3.4 Key point summary

- Individuals’ productivity is only defined in the context of the work they do. This means, in practice, wages are the only practical measures of individuals’ labour productivity.

- While there is a strong theoretical link between wages and productivity, there can be departures in practice. Nevertheless, the empirical literature suggests that relative wages reflect relative productivity to a large degree and more so in Australia.

- There are some personal characteristics that could be considered to reflect potential productivity in a broad sense. The empirical literature has typically found age, gender, educational attainment and work experience to be positively associated with productivity.

- A wedge or gap between wages of migrants and non-migrants is often found. However, this can reflect wage disadvantage (productivity-related differences) as well as discrimination (lower wages for the same productivity).

- Australia appears to have low wage discrimination against migrants by comparison to other OECD countries.

- Migrants to Australia can have both wage advantages and disadvantages:
  - Those with advantages tend to be relatively-recent arrivals from English-speaking countries.
  - Those with disadvantages tend to come from non-English speaking countries and the disadvantage appears to be associated with fluency in English, low skill or the transferability of human capital (qualifications and experience).

- Overall, while the issues are not completely settled, the literature suggests it is reasonable to use wages as a measure of individual productivity in Australia for both migrants and non-migrants. Overall, wage differences between migrants and non-migrants in Australia appear to be, primarily, a result of measurable productivity differences.
4 MIGRATION, SKILLS AND PRODUCTIVITY

This chapter reviews trends in Australia’s productivity performance and assesses some of the influence that migration has had on national, industry and regional productivity (terms of reference 6c). Chapter 2 canvassed a variety of ways in which migration could affect productivity. Here, we look only at the skills channel—that is, the extent to which migrants have skills that help to promote productivity growth in the Australian economy. Skills are part of the ‘Human Capital’ channel and an immediate determinant outlined in the productivity framework of Chapter 2.

We undertake an empirical assessment of the contribution of migrants to skills and productivity in Australia. While the analysis is illuminating, it is also limited in its coverage. It only measures the migrant contributions between the two population censuses in 2006 and 2011.

The chapter is structured as follows. The first section reviews Australia’s productivity trends over the past four decades and the main factors that have led to changes in trajectory. The second section introduces the methodology used to relate skills to productivity growth. The third section applies the methodology to assess the contributions that migration has made to increased skills and productivity growth in the Australian economy. The data that explain the migrant contributions are examined in section four. The fifth section extends the assessment in the industry dimension and the sixth, and final, section extends the assessment in the regional dimension.

4.1 Productivity trends

The ABS estimates of productivity in the 12-industry market sector (MS-12) form the most accurate and longest available series on Australia’s productivity performance. The ABS confines its preferred productivity estimates to the market sector, where outputs can be valued through the prices they gain in market transactions. The productivity series for the MS-12 commence in 1973-74. The 12 industries are listed for information in Table 4.1. Other industry groupings that are used later in the chapter are also listed for later reference.

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17 In non-market industries, such as public administration, output tends to be valued in terms of expenditures, which in turn are related to input use. A productivity measure based on the ratio of output to input is therefore not very meaningful.

18 The ABS now uses a 16-industry market sector for its productivity estimates. The series for the 16-industry market sector, however, only reaches back to 1994-95.
### Australia’s productivity record over the past four decades can be divided into three periods: a baseline growth period, a productivity growth surge and a productivity growth slump (Figure 4.1).

#### 4.1.1 The baseline

The baseline period from the mid-1970s to the mid-1990s is representative of Australia’s historical rate of productivity growth. Arguably, the period from 1984-85 is even more representative, given that it excludes the large fall in capital productivity from the mid-1970s up to that point, and the influence of drought on the early 1980s performance.\(^\text{19}\) Labour productivity grew at 1.9 per cent a year from 1984-85 to 1993-94 and multifactor productivity (MFP) grew at 0.9 per cent a year (Table 4.2).

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\(^{19}\) 1984-85 is the start of a new productivity cycle in ABS productivity estimates (ABS Cat. No. 5260.0.55.002). There are no current industry productivity estimates to help explain the earlier productivity trends. The ABS publishes industry estimates for years 1989-90 and beyond. Estimates from Gretton and Fisher (1997) suggest that the fall in capital productivity in the 1970s and early 1980s was centred on the mining industry.
Figure 4-1 Australia's productivity record since the 1970s

indexes, 2003-04 = 100

![Graph showing productivity growth from 1973-74 to 2013-14 with labels for baseline, surge, and slump periods.]

Note: a. 12-industry market sector
Source: Rebased data from ABS Cat. No. 5260.0.55.002

4.1.2 The surge

Productivity growth was at record highs during the surge period from 1993-94 to 2003-04. Annual measured labour productivity growth increased in rate by more than 50 per cent, from 1.9 to 3.2 per cent a year (Table 4.2).

As shown in Chapter 2, labour productivity growth is a combination of capital deepening and MFP growth. Figure 4.2 depicts labour productivity growth (the height of the bars) as the sum of capital deepening (in blue) and MFP growth (in red). It shows that the rate of capital deepening has been relatively steady across the periods, while MFP growth has accounted for more of the variation in LP growth.

Table 4-2 Rates of productivity growth over the baseline, surge and slump periods

<table>
<thead>
<tr>
<th>Period</th>
<th>Multifactor productivity (% per year)</th>
<th>Labour productivity (% per year)</th>
<th>Capital productivity (% per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1973-74 to 1984-85</td>
<td>0.5</td>
<td>2.2</td>
<td>-2.2</td>
</tr>
<tr>
<td>1984-85 to 1993-94</td>
<td>0.8</td>
<td>1.9</td>
<td>-0.9</td>
</tr>
<tr>
<td>1973-74 to 1993-94</td>
<td>0.6</td>
<td>2.1</td>
<td>-1.6</td>
</tr>
<tr>
<td>Surge:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1993-94 to 2003-04</td>
<td>1.8</td>
<td>3.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Slump:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003-04 to 2013-14</td>
<td>-0.1</td>
<td>2.1</td>
<td>-2.4</td>
</tr>
</tbody>
</table>

Note: a. 12-industry market sector
Source: Author estimates based on data from ABS Cat. No. 5260.0.55.002
Figure 4.2 Contributions of capital deepening and MFP growth to labour productivity growth

Figure 4.2 clearly shows that the acceleration in labour productivity growth in the surge was mostly due to the acceleration in the rate of MFP efficiency improvement, rather than to faster capital deepening. The rate of MFP growth more than doubled from its baseline rate to 1.8 per cent a year (Table 4.2). Over the ABS-defined productivity cycle between 1993-94 and 1998-99, MFP accelerated to an exceptional 2.5 per cent a year.\(^{20}\)

The productivity surge is widely attributed to a combination of microeconomic reforms and the ‘IT revolution’.\(^{21}\) Reforms had some direct effects on productivity, such as lifting the performance of government-owned utilities through the introduction of various degrees of commercialisation. Opening the economy to trade and investment stimulated competitive pressures and the transfer of knowledge. Increased competitive pressures in many areas of the economy provided important ‘drivers’ for businesses to seek out and take advantage of new opportunities for productive innovations, such as those enabled by information and communications technologies (ICTs). Reforms also brought greater flexibility in business and work arrangements, which was important in allowing the kinds of business transformations and new business models that ICT-based innovation required. This surge period can be viewed as Australia transitioning toward a more outward-oriented, innovative and knowledge-based economy, more focussed on services.

### 4.1.3 The slump

As Figure 4.2 indicates, it is MFP growth that has slumped since 2003-04. Labour productivity growth has slowed, but it has kept pace with the rates achieved in the decades before the productivity

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\(^{20}\) The ABS identifies productivity cycles over which to calculate rates of productivity growth that are independent of cyclical effects. The rates could be considered as ‘underlying’ rates of productivity growth.

\(^{21}\) See, for example, OECD (2000), Parham (2004, 2013) and PC (2009) for discussion.
surge. MFP growth has been slightly negative which, over such a long period, is highly unusual and difficult to explain at first glance.

The major development in the slump period has actually been the fall in capital productivity at a rate of 2.4 per cent a year since 2003-04. One explanation for this finding is the massive investment as part of the mining boom.22 Viewing MFP growth as a weighted average of capital productivity and labour productivity, the fall in capital productivity has been a drag on MFP growth.

The Millennium mining boom explains much of the fall in capital productivity. There has been massive investment in new mining capacity, along with additional capital requirements for example in new infrastructure, which has added more to capital growth than to output growth, at least for the time being.23 Capital productivity has declined sharply as a result.

4.1.4 The takeaway for migration and productivity

The key message is that transformation in the Australian economy over the past two decades has totally dominated any productivity performance that may have occurred as a result of migration. This is not to say that migration has not had any important or discernible effect. It is just that other factors have been so dominant that we need to look in finer detail in order to identify the effects from migration.

4.2 Assessing the contribution of increased skills to productivity growth

While we focus on the role that migrants have played, it is worth first reviewing the methodology used to assess the role of skills in lifting productivity. This provides a valuable perspective on how skills in general—irrespective of whether through migrants or the Australian-born—have affected Australia’s productivity growth.

The ABS’s quality-adjusted labour input (QALI) framework takes account of the distribution of skills in measuring labour input for the purpose of calculating productivity growth. The QALI method is detailed in ABS (2006). The general approach can also be gleaned from the methodology for migrant and non-migrant QALI presented in the Annex to this chapter.

QALI embellishes the traditional and common approach, which has been to measure labour input simply as the hours worked by those employed. The hours worked measure has been used in the calculation of productivity trends reported above and it is the foundation for the productivity measures often used in policy discussions.

4.2.1 The QALI approach explained

Let us start by thinking of a number of skill groups that are defined by educational attainment and work experience. We know the total hours worked by people in each of the skill groups.

For the conventional hours worked measure of labour input, the hours worked in each of the skill groups are simply summed together to form a total hours worked measure. This is represented in the top part of Figure 4.3.

The approach implies that the productivities of the different skill groups are the same. That is, it presumes that an hour of work by a skilled worker produces the same amount of output as an unskilled worker. This is highly unlikely in reality.

**Figure 4-3 A representation of an hours worked and QALI measure of labour input**

The QALI method addresses the weakness in the conventional approach. It applies weights to the aggregation of hours worked by the different skill groups, where the weights reflect the relative productivities of an hour of work from the different skill groups. This is represented in the bottom part of Figure 4.3.\(^{24}\) In the case represented, growth in quality-adjusted labour input is greater than growth in hours worked.

To implement QALI it is assumed that relative hourly wages reflect the relative productivities of the skill groups. In Chapter 3 we examined how well relative wages reflect relative productivities and found them to be a good approximation.

QALI only takes account of direct productivity effects of skills—that is, productivity effects reflected in wages. It does not account for any indirect ‘spill-over’ effects, such as those suggested in endogenous growth theories, in which the accumulation of skills in the workforce affects the rate of productivity growth.\(^{25}\)

The skill categories used by the ABS are outlined in the next section.

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\(^{24}\) The actual process the ABS uses is more mathematically complicated than this, but this simplified version illustrates the principle involved. The relationship depicted does hold in terms of growth in hours worked.

\(^{25}\) See for example Lucas (1988).
**Changes in skill intensity**

The ‘level’ of QALI is not at all informative. QALI is measured as an index, set to 100 in a reference year. On the other hand, growth in QALI over a period provides us with valuable information.

The difference between growth in QALI and growth in hours worked is a measure of the change in labour input that is due to changes in the composition or mix of skills:

\[
growth \text{ in } QALI = growth \text{ in } hours \text{ worked } + growth \text{ in skill composition}
\]

The word ‘composition’ is important. Growth in the QALI measure captures changes in the mix of skills or, more precisely, changes in the distribution of hours worked across the different skill categories.

Growth in QALI only diverges from growth in hours worked if there is a change in skill composition. If hours worked in all skill categories increased by 10 per cent, there would be no change in skill composition and, therefore, growth in QALI would equal growth in hours worked. But if growth in hours worked was more rapid in a high-skill category, which receives a higher weight, growth in QALI would be higher than growth in the simple hours worked measure.

With a modicum of license, ‘growth in skill composition’ could also be thought of as ‘growth in average skill’.\(^{26}\) If there is even growth in hours worked across skill groups, there will be no change in skill composition and no change in the average skill level.

Note that QALI refers to the skill composition of the employed workforce and not to the population at large.

**Attributing productivity growth to increases in skill**

The QALI measure can be used to attribute a part of labour productivity and MFP growth to a change in skill composition.

Growth in labour input will typically be greater with a QALI measure than with an hours worked measure. That is because the usual trend is toward an increase in the average level of skills (and higher skills receive higher wage rewards).

Consequently, labour productivity growth will be lower with a QALI measure than with an hours worked measure. QALI growth is larger than hours worked growth and labour productivity growth is output growth less labour input growth.\(^{27}\)

The difference between labour productivity calculated with a QALI measure and an hours worked measure can be taken as the contribution of growth in average skill to labour productivity growth.

---

\(^{26}\) This is true if wage relativities do not change.

\(^{27}\) Labour productivity is output divided by labour input. In growth terms, labour productivity growth equals output growth less labour input growth.
The growth in average skill or skill composition is the difference between the two labour productivity measures.\textsuperscript{28}

The same applies to MFP growth, with a further adjustment. With MFP, input growth is a weighted sum of capital growth and labour growth, where the weights are the capital share of income and the labour share of income respectively. The difference between MFP growth calculated with a QALI and an hours worked measure is therefore the growth in skill composition multiplied by the labour share of income. Consequently, the growth in skill composition, multiplied by the labour share of income, can be taken as the contribution of skills to conventionally measured (hours worked) MFP growth.

Figure 4.4 illustrates a hypothetical case of MFP growth. Looking at the blue bars, which represent the case of an hours worked measure of labour input, MFP growth (2 per cent) is the difference between output growth (6 per cent) and input growth (4 per cent). The combined input growth is comprised of 3 percentage points of (weighted) growth in capital and 1 percentage point of (weighted) growth in hours worked.\textsuperscript{29}

The red bars in Figure 4.4 represent labour input as measured in QALI terms. Growth in QALI constitutes 2 percentage points of input growth—the same as 1 percentage point from growth in hours worked, plus an additional 1 percentage point from growth in average skill. Given output growth remains the same, the residual MFP growth after subtracting input growth is reduced to 1 per cent when the QALI measure is used.

In this illustrative example, we can state that increased skill contributes 1 percentage point to conventionally-measured MFP growth—that is, MFP growth based on an hours worked measure of labour input.

**Figure 4-4 Illustration of how QALI affects measured MFP growth**

---

\textsuperscript{28} Using $Y$ to denote output, $L$ to denote hours worked, $S$ to denote skill composition and lower cases to denote growth rates, labour productivity growth with a QALI measure is $Y-L-S$ and labour productivity growth with an hours worked measure is $Y-L$. Therefore $S$ is the difference between the two measures.

\textsuperscript{29} The growth in capital and in labour are weighted by the shares of capital and of labour in total income. See Box 4.1.
4.2.2 Application: Skill intensity and productivity growth for all persons

Let us now look at the ABS’s published QALI series and see what it says about growth in skills.

The skill categories used by the ABS are presented in Table 4.3. Age is used as a proxy for workforce experience. Gender is used to take account of the time that women have out from the workforce for child birth and rearing.

The ‘Skilled’ category here refers to workers with a non-university post-secondary education qualification (e.g. a TAFE qualification or an apprenticeship).

Table 4-3 Categories used to define skill groups in the published ABS QALI series

<table>
<thead>
<tr>
<th>Educational attainment</th>
<th>Age group</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unqualified</td>
<td>15 to 24 years old</td>
<td>Male</td>
</tr>
<tr>
<td>Skilled</td>
<td>25 to 34 years old</td>
<td>Female</td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>35 to 44 years old</td>
<td></td>
</tr>
<tr>
<td>Higher degree</td>
<td>45 to 54 years old</td>
<td></td>
</tr>
<tr>
<td></td>
<td>55 to 64 years old</td>
<td></td>
</tr>
</tbody>
</table>

Source: ABS (2014)
Box 4.1: The relationship between QALI and MFP

Starting with the growth accounting equation that links output growth ($\dot{Y}$) to input growth ($\dot{I}$) and multifactor productivity growth ($MFP$):

$$\dot{Y} = \dot{I} + \dot{MFP}$$

Now, input growth is a weighted sum of growth in capital ($\dot{K}$) and growth in QALI:

$$\dot{Y} = w_K \cdot \dot{K} + w_L \cdot \dot{QALI} + \dot{MFP}$$

and growth in QALI is the sum of growth in hours worked ($\dot{H}$) and growth in skill composition ($\dot{SC}$):

$$\dot{Y} = w_K \cdot \dot{K} + w_L \cdot \dot{H} + w_L \cdot \dot{SC} + \dot{MFP}$$

The weights $w_K$ and $w_L$ are the shares of capital and labour in total factor income respectively.

The last two terms $w_L \cdot \dot{SC} + \dot{MFP}$ comprise the size of conventionally-measured MFP growth based on an hours worked labour input measure and so $w_L \cdot \dot{SC}$ is the contribution of skill composition to conventionally-measured MFP growth.

Figure 4.5 shows the ABS QALI series from its starting point of 1979-80, together with the hours worked series from the same year. To help distinguish these series from the migrant and non-migrant series presented later, they are referred to as the ‘all persons’ QALI and hours worked series.

The all-persons QALI has grown more rapidly than hours worked over the entire period. Thus, in general, there has been a shift in the composition of skills toward higher skills—or an increase in average skill. The increase in skill was even greater in the 16-industry market sector (Table 4.4).

The skill composition growth, shown in Table 4.4, can be taken as the contribution of increased skills to labour productivity growth. That is, if labour productivity had been calculated on an hours worked basis, higher skills would account for between 0.38 and 0.50 of a percentage point of annual labour productivity growth (Table 4.4).

The contribution to MFP growth requires scaling by the labour income share. Table 4.4 shows the skill contribution to MFP growth ranged from 0.22 to 0.32 of a percentage point of annual MFP growth, when MFP growth is estimated with an hours worked measure of labour input.
Figure 4-5 Hours worked and quality-adjusted labour input\textsuperscript{a} indexes, 2003-04 = 100

![Graph](image)

Note: \textsuperscript{a} 12-industry market sector

Source: Rebased data from ABS Cat. No. 5260.0.55.002

Table 4-4 Growth rates in QALI, hours worked and skill composition\textsuperscript{a}

<table>
<thead>
<tr>
<th>Period</th>
<th>Market sector\textsuperscript{b}</th>
<th>QALI</th>
<th>Hours worked</th>
<th>Skill composition</th>
<th>Skill MFP contribution\textsuperscript{c}</th>
<th>MFP growth\textsuperscript{d}</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984-85 to 1993-94</td>
<td>MS-12</td>
<td>1.33</td>
<td>0.95</td>
<td>0.38</td>
<td>0.22</td>
<td>0.8</td>
</tr>
<tr>
<td>1993-94 to 2003-04</td>
<td>MS-12</td>
<td>1.46</td>
<td>1.04</td>
<td>0.43</td>
<td>0.24</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>MS-16\textsuperscript{e}</td>
<td>2.01</td>
<td>1.53</td>
<td>0.47</td>
<td>0.32</td>
<td>1.6</td>
</tr>
<tr>
<td>2003-04 to 2013-14</td>
<td>MS-12</td>
<td>1.44</td>
<td>0.97</td>
<td>0.47</td>
<td>0.25</td>
<td>-0.1</td>
</tr>
<tr>
<td></td>
<td>MS-16</td>
<td>1.70</td>
<td>1.20</td>
<td>0.50</td>
<td>0.29</td>
<td>-0.2</td>
</tr>
</tbody>
</table>

Notes: \textsuperscript{a} Growth rates calculated as differences in natural logarithms of variables
\textsuperscript{b} The 12-industry market sector (MS-12) and the 16-industry market sector (MS-16).
\textsuperscript{c} Skill composition weighted by the labour share of income.
\textsuperscript{d} Calculated on an hours worked basis
\textsuperscript{e} Calculated from 1994-95

Source: Author estimates based on data from ABS Cat. No. 5260.0.55.002

The growth in skill composition has remained relatively unchanged despite large changes in MFP growth over the surge and slump periods. Again, factors other than changes in the skill mix had the major effects on the surge and slump in productivity growth.

We stress that growth in skills has been an important contributor to Australia’s productivity growth. A contribution of up to 0.5 of a percentage point of annual labour productivity growth and 0.3 of a percentage point of annual MFP is important. (The long-term rates of labour and multifactor productivity growth in the 12-industry market sector are 2.3 and 0.9 per cent a year respectively).
The shift toward skills accounted for over a quarter of the MFP growth in the baseline period and its annual contribution to MFP growth increased in subsequent periods (Table 4.4).

### 4.3 The contributions of migration to skills and productivity

Thanks to some additional data the ABS provided for this project, we were able to use the QALI methodology to calculate the increase in average skill in both the pools of employed migrants and non-migrants. These calculations were used to estimate the contribution of migrants to the growth in skill in Australia’s employed workforce and to Australia’s productivity growth.

The ABS used data from the Census of Population and Housing to estimate a migrant QALI measure and a non-migrant QALI measure. Their methodology is set out in the Annex to this chapter. The same classifications to define skill categories were used (Table 4.3), with the exception that no gender distinction was made. The ABS reported that it was only feasible in the time available to undertake the exercise on data for the 2006 and 2011 censuses. While the ABS did interpolate data to provide an annual series from 2006 to 2011, we have chosen to conduct the analysis in terms of growth rates between the two Census points.

Given that Census data were used, ‘migrants’ in these measures refer to people who were born overseas and have come to Australia temporarily or permanently. No account is taken of when they arrived or if they became permanent residents or citizens. No distinction can be made between attainment of qualifications overseas or in Australia. Changes in the skill distribution of the overseas-born can come from changes in skills among those already in Australia or from a skewed flow of new migrants.

The ABS provided data for the 16-industry market sector, for an ‘all industries’ total and for each individual industry (see Table 4.1 for industry descriptions).

While the unpublished ABS data enabled us to undertake some useful analysis of the effects of migration, it is acknowledged 2006 to 2011 is a short period in the history of migration to Australia. That qualifies the extent to which our results can be generalised to the long term.

What the analysis does show, however, is that migration has played a significant role in the flexibility of the Australian workforce to change over a 5-year period and in doing so has brought productivity gains.

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30 The QALI measures for all persons, as reported in the previous section, are also based on population census data.
31 The methodology depends on the absence of categories with observations of zero hours worked. The gender distinction was suppressed in order to deal with a number of ‘zeros’ that would otherwise have appeared.
32 Although the Census does ask migrants about year of arrival, information on time in Australia was not used.
33 The all-industries total can also be taken to be the economy-wide total in regard to labour input, as the one activity outside of ‘all industries’—ownership of dwellings—does not employ labour.
4.3.1 Growth in migrant and non-migrant QALI measures

Annual average rates of growth in the quality-adjusted labour input between 2006 and 2011 are presented in Table 4.5.

The overseas-born QALI grew at a very rapid rate of 3.6 per cent a year in the 16-industry market sector. This was double the rate of growth in the Australian-born QALI.

Most of the difference in QALI growth rates was due to difference in rates of growth in hours worked. Migrant hours grew at a 1.7 percentage point higher rate than non-migrant hours.

There was also a difference in the rate of upskilling, albeit relatively small. The growth in skill of the overseas-born employed in the market sector rose at 0.57 per cent a year, whereas the average skill of the Australian-born increased at 0.50 per cent a year. The same gap of 0.07 a percentage point of annual growth was also evident in the economy generally.

Table 4-5 Components of growth in QALI between 2006 and 2011a

<table>
<thead>
<tr>
<th></th>
<th>QALI</th>
<th>Hours worked</th>
<th>Skill composition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>16-industry market sector:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overseas-born</td>
<td>3.56</td>
<td>2.99</td>
<td>0.57</td>
</tr>
<tr>
<td>Australian-born</td>
<td>1.81</td>
<td>1.31</td>
<td>0.50</td>
</tr>
<tr>
<td><strong>Economy:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overseas-born</td>
<td>3.88</td>
<td>3.35</td>
<td>0.53</td>
</tr>
<tr>
<td>Australian-born</td>
<td>2.13</td>
<td>1.68</td>
<td>0.46</td>
</tr>
</tbody>
</table>

Note: Growth rates calculated as differences in natural logs
Source: Author estimates based on unpublished ABS data

The roles of qualifications and experience

The changes in skills can be separated into contributions from educational attainment and from experience (age).

Migrants and the Australian-born took different paths to higher average skill. The Australian-born path was a combination of higher educational attainment and experience, whereas the migrant path was entirely higher educational attainment (Figure 4.6). In fact, for migrants, the increase in educational attainment offset a shift toward younger, less-experienced workers.
The difference between migrants and non-migrants in terms of shifts in age structure has broader implications. Migration is not only adding to the formal skills in the workforce, but is also providing some offset to the ageing of the Australian population and workforce. While it would be very unlikely to provide complete or substantial offset, migration is having some effect at the margin that will have longer-term and positive implications for economic growth by raising the proportion of the population that is of working age, above what it would otherwise be.

### 4.3.2 Contributions of migration

The data used for QALI estimates are not strictly compatible with the ABS market sector productivity data. There are differences in timing and the hours worked data for the productivity estimates are drawn from the Labour Force Survey, rather than the Census. Nevertheless, we can derive some approximate contributions of migrants and the Australian-born to market sector skills growth and productivity growth.

**Migration contribution to the increase in skill**

The migrant and non-migrant QALI growth estimates for the 16-industry market sector are reproduced in Figure 4.7, along with the all-persons QALI growth between 2005-06 and 2010-11. The all-persons estimate was derived from the data presented in Section 4.2. The all-persons QALI growth appears to be, as it should, an average between growth in migrant QALI and non-migrant QALI, as well as in the QALI components of growth in hours worked and skill composition.

Ideally, a weighted average of the migrant and non-migrant skill intensity components would equal the all-persons skill contribution. The weighted average of the 0.57 and 0.50 contributions in this...
case produced a figure of 0.52 per cent per year, which is a close approximation to the 0.51 figure generated from the all-persons data.  

The weighted skill components suggest that the overseas-born contributed one-third and the Australian-born two-thirds of the all-persons growth in skill.  

**Migrant contribution to productivity growth**  

We can use the migrant contribution to higher skill to calculate the migrant contribution to productivity growth, based on an hours worked measure of labour input.  

The measures derived here only take account of the direct effect of skills through the human capital channel. They do not account for indirect spill-over effects, for example, on the accumulation of knowledge or the scale effects that a higher population might bring.  

The migrant skill contribution to skills growth in the 16-industry market sector translates directly to a migrant contribution to annual labour productivity growth between 2006 and 2011 of 0.17 of a percentage point. This compares with an average rate of labour productivity growth between 1998-99 and 2007-08 of 1.79 per cent a year and an average rate of labour productivity growth between 1994-95 and 2007-08 of 2.41 per cent a year.  

For the MFP contribution, we multiply by the labour income share (Box 4.1). This suggests that migrants contributed 0.1 of a percentage point of annual MFP growth between 2006 and 2011. This compares with an average rate of MFP growth between 1998-99 and 2007-08 of 0.36 per cent, and an average rate between 1994-95 and 2007-08 of 0.95 per cent.  

This contribution is an incremental contribution, based on the qualifications and experience of the people who were born overseas and were in work at the time of the two Censuses. It does not tell us the difference in MFP growth because of migration over the long term.

---

34 Income shares were used as weights, with values of 0.294 for migrants and 0.706 for non-migrants.  
35 $0.57 \times 0.294 = 0.167$, which is 32 per cent of 0.517.  
36 See footnote 32.  
37 This is the longest period for which the ABS publishes an underlying rate of growth for the 16-industry market sector.  
38 The average income share between 2006 and 2011 was 0.573 and $0.573 \times 0.167 = 0.096$.  

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4.4 Delving into the ABS migrant and non-migrant data

The base data for the migrant and non-migrant QALI calculations are the hours worked in each of the skill categories for migrants and for non-migrants and the wages in each skill category for both migrants and non-migrants.

It is worth having a closer look at these data, for two reasons. First, it provides further insight into the sources of the up-skilling just observed. Second, given the interest in wage and productivity comparisons between migrants and non-migrants in this report, the data give insights into the differences between the migrant and non-migrant pools.

That the Census is not the best source of data on either hours worked or wage rates is an important caveat.

4.4.1 The 2006 data

Table 4.6 shows in the top half the percentage distribution of migrant hours worked across the skill categories (left hand side) and the percentage distribution of non-migrant hours worked (right hand side). Migrants accounted for about 27.6 per cent of hours worked in the MS-16 in 2006.

The bottom half of the table shows the hourly average wage in each skill category. On the left hand side, the migrant wage is also shown as a percentage (in brackets) of the non-migrant wage in the same skill category. The wage numbers should be treated as broadly indicative only and are best used to suggest relativities between skill groups.
Generally small. However, on wage rates, the differences between migrants and non-migrants (category per cent) for migrants (horizontal proportion of hours worked by migrants (34.9 versus 30.3 per cent)) was by unqualified individuals (11.8 and 2.9 per cent). Australian-born workers had a higher proportion of employment in only the skilled category (34.9 versus 30.3 per cent).

Australian-born workers were less experienced (younger). Forty per cent of hours worked by non-migrants were by 15 to 34 year olds (2 top-right cells in top-right quadrant), compared with 26 per cent for migrants (2 top-right cells in top-left quadrant).

On wage rates, the differences between migrants and non-migrants in each of the categories were generally small. However, there were a few exceptions. Non-migrants with bachelor degrees were paid noticeably more than migrants in the (same) older age groups, as were those with higher

<table>
<thead>
<tr>
<th>Age</th>
<th>Migrants</th>
<th>Non-migrants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unqualified</td>
<td>Skilled</td>
</tr>
<tr>
<td>15 to 24</td>
<td>4.4</td>
<td>1.5</td>
</tr>
<tr>
<td>25 to 34</td>
<td>6.1</td>
<td>4.8</td>
</tr>
<tr>
<td>35 to 44</td>
<td>12.5</td>
<td>9.5</td>
</tr>
<tr>
<td>45 to 54</td>
<td>13.2</td>
<td>8.8</td>
</tr>
<tr>
<td>55 to 64</td>
<td>8.6</td>
<td>5.7</td>
</tr>
<tr>
<td>Total</td>
<td>44.8</td>
<td>30.3</td>
</tr>
</tbody>
</table>

**Hours worked shares (%)**

14.64 | 16.90 | 18.96 | 18.08 | 15.97 | 13.44 | 17.20 | 19.41 | 20.22 | 14.83 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>(109)</td>
<td>(98)</td>
<td>(98)</td>
<td>(89)</td>
<td>(108)</td>
<td>(99)</td>
<td>(97)</td>
<td>(93)</td>
<td>(102)</td>
<td>(108)</td>
</tr>
<tr>
<td>20.06</td>
<td>21.89</td>
<td>28.02</td>
<td>27.51</td>
<td>23.76</td>
<td>20.31</td>
<td>22.49</td>
<td>30.06</td>
<td>35.51</td>
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</tr>
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<td>(97)</td>
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<td>20.87</td>
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<td>21.71</td>
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<td>(96)</td>
<td>(100)</td>
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<tr>
<td>20.45</td>
<td>24.24</td>
<td>31.50</td>
<td>35.92</td>
<td>24.65</td>
<td>19.62</td>
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<td>(104)</td>
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<td>(86)</td>
<td>(106)</td>
<td>(104)</td>
<td>(103)</td>
<td>(93)</td>
<td>(86)</td>
<td>(106)</td>
</tr>
</tbody>
</table>

**Hourly wage ($)**

**Note:**

a. 16-industry market sector

b. Numbers in brackets are the wages of migrants expressed as a percentage of the non-migrant wage in the corresponding skill category

**Source:** Unpublished ABS data

These data suggest that migrant employment in the MS-16 was more highly skilled than the Australian-born in 2006. This was true in both qualification (horizontal) and experience (vertical) dimensions.

Working migrants were more qualified on average than their Australian-born counterparts. Half of the non-migrant hours worked was by unqualified individuals (bottom-left cell in top-right quadrant), whereas 45 per cent of migrant hours worked was by unqualified individuals (bottom-left cell of top-left quadrant). Moreover, bachelor and higher degree graduates formed a higher proportion of hours worked by migrants (18.1 and 6.8 per cent) than by non-migrants (11.8 and 2.9 per cent). Australian-born workers had a higher proportion of employment in only the skilled category (34.9 versus 30.3 per cent).

Australian-born workers were less experienced (younger). Forty per cent of hours worked by non-migrants were by 15 to 34 year olds (2 top-right cells in top-right quadrant), compared with 26 per cent for migrants (2 top-right cells in top-left quadrant).

On wage rates, the differences between migrants and non-migrants in each of the categories were generally small. However, there were a few exceptions. Non-migrants with bachelor degrees were paid noticeably more than migrants in the (same) older age groups, as were those with higher
degrees in the 25 to 34 and the 35 to 44 age groups (compare the third and fourth columns in the bottom-left and bottom-right quadrants).

With their higher average skill overall, however, migrants are paid more than non-migrants. These figures suggest an overall migrant wage advantage of 6 per cent ($24.65 per hour versus $23.35).

The evidence of caps on the wage premium for experience is of note. For both migrants and non-migrants, there is little wage premium for experience beyond the 25 to 34 year age group. There is a small further rise for 35 to 44 year olds, but that disappears in the higher age groups.

4.4.2 The 2011 data

With the more rapid growth in hours worked by migrants, they accounted for a higher 29.3 per cent of hours worked in 2011.

There was an increase in skill intensity in work performed by both the migrant and non-migrant workforces between 2006 and 2011. The distribution of hours worked in the MS-16 in 2011 is shown in the upper part of Table 4.7.

As shown in the previous section, there were shifts up in educational attainment. The proportion of work by unqualified non-migrants dropped 5 percentage points, which was redistributed mostly to the skilled category and, to some extent, to those with university degrees and with higher degrees. For migrants, the proportion of unqualified work dropped nearly 7 percentage points and this was redistributed in roughly equal measure to degrees and higher degrees.

Relative to 2006, the Australian-born workforce became more experienced (older), while the migrant workforce became less experienced (younger), presumably due to shift in intake towards the young. For the Australian-born, there were proportionately less in the 15 to 24 and the 25 to 34 year age groups and more in the older age groups, especially the 55 to 64 group. The biggest shift among migrants was from 35 to 44 year olds to 25 to 34 year olds.
Table 4-7 Distribution of hours worked and average hourly wage in skill categories in 2011\(^a\)

<table>
<thead>
<tr>
<th></th>
<th>Migrants</th>
<th>Non-migrants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unqualified</td>
<td>Skilled</td>
</tr>
<tr>
<td>15 to 24</td>
<td>Hours worked</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.8</td>
<td>1.8</td>
</tr>
<tr>
<td>25 to 34</td>
<td>5.9</td>
<td>5.7</td>
</tr>
<tr>
<td>35 to 44</td>
<td>9.2</td>
<td>8.5</td>
</tr>
<tr>
<td>45 to 54</td>
<td>11.3</td>
<td>8.9</td>
</tr>
<tr>
<td>55 to 64</td>
<td>7.8</td>
<td>5.5</td>
</tr>
<tr>
<td>Total</td>
<td>38.0</td>
<td>30.4</td>
</tr>
</tbody>
</table>

|                  | Hourly wage ($)            |                             |         |           |       |             |         |         |           |       |
|                  | (109)                      | (97)                       | (98)    | (88)      | (107) |             |         |         |           |       |
| 25 to 34         | 24.25                      | 25.80                      | 32.48   | 32.21     | 28.59 | 24.84       | 27.61   | 36.02    | 40.35     | 28.70 |
|                  | (98)                       | (93)                       | (90)    | (80)      | (100) |             |         |         |           |       |
| 35 to 44         | 26.47                      | 30.60                      | 41.89   | 45.61     | 33.74 | 27.09       | 30.74   | 45.60    | 50.81     | 32.50 |
|                  | (98)                       | (100)                      | (92)    | (90)      | (104) |             |         |         |           |       |
| 45 to 54         | 25.02                      | 30.85                      | 40.43   | 47.88     | 31.17 | 25.90       | 30.71   | 45.76    | 49.62     | 30.83 |
|                  | (97)                       | (100)                      | (88)    | (96)      | (101) |             |         |         |           |       |
| 55 to 64         | 24.81                      | 30.15                      | 40.09   | 46.59     | 29.68 | 25.13       | 29.99   | 44.08    | 47.32     | 29.48 |
|                  | (99)                       | (101)                      | (91)    | (98)      | (101) |             |         |         |           |       |
| Total            | 24.50                      | 29.12                      | 37.12   | 40.83     | 30.25 | 23.74       | 28.81   | 40.22    | 47.54     | 28.66 |
|                  |                            |                            |         | (103)     | (101) |             |         |         |           |       |

Source: Unpublished ABS data

In regard to the wage rates presented in the bottom part of Table 4.7, there were no big changes in relativities between migrants and non-migrants, although there was some catch up for migrants with university degrees.

4.4.3 Migrant flows between 2006 and 2011

Figure 4.8 gives the composition of net migration flows into Australia in order to illustrate the sources of change in the employed migrant workforce. The figures are an average of the annual flows between 2006 and 2011. They refer to the entire net migration flow, and not just to the proportion that works in the market sector.

Students formed the largest group. This group would not be included in the employed MS-16 workforce, unless some were working part-time. Nevertheless, many former students would have stayed on in Australia after completing their degrees to work. The skilled migrant category is the next largest and would have assisted the increase in skill intensity among migrants. This is also likely to be the case for temporary residents under Skilled (subclass 457) visas.
4.5 **Industry dimension**

The ABS provided us with the estimates of the skill contributions for migrants and non-migrants at the industry level. As mentioned in Chapter 2, the productivity effects of migration depend not only on the skills of migrants, but also on the allocation of migrants to firms and industries.

The ABS data gives us an opportunity to view the industry allocation of migrants at the two Census points. By ‘allocation’ we mean simply the distribution of work across industries. No account can be taken of whether there was any mechanism that bound migrants to work in any specific firm or industry.

The industry allocation is shown first before presenting the industry QALI measures.

4.5.1 **Industry allocation of migrants**

Figure 4.9 shows the distribution of hours worked by migrants across industries in 2006 and 2011. The distributions are in percentage terms, so that they sum to 100 in both years. The full industry titles can be found back in Table 4.1.

Migrants are mostly found working in Manufacturing, Health care & social assistance, Professional, scientific & technical services, Retail trade and Construction. While the highest concentration was found in Manufacturing in 2006, there was a relatively strong shift away from Manufacturing by 2011 and toward the Health and Professional sectors. The health sector held the highest concentration in 2011. Although Mining has relatively few migrants, there was a sizeable step up in concentration between 2006 and 2011, which we associate with the mining boom.
Figure 4-9 Distribution of migrant hours worked by industry

Source: Author estimates based on unpublished ABS data
The industry distributions of migrants and non-migrants are not substantially different (Figure 4.10). However, a greater proportion of migrants is found in Manufacturing, Health, Professional and Accommodation & food. Proportionately fewer migrants are employed in Public administration & safety, Education & training, Construction and Agriculture.
Figure 4-11 Proportion of work performed by migrants by industry

Source: Author estimates based on unpublished ABS data

Figure 4.11 shows the percentage of hours worked in each industry performed by migrants in 2006 and 2011. The overall averages (27 per cent in 2006 and 28.7 per cent in 2011) are drawn for reference as dashed lines.

Migrants perform the highest proportions of hours worked in Accommodation & food, Health, Administrative support, Professional, Financial & insurance services and Manufacturing.
4.5.2 Skill contributions

The QALI measures provide estimates of the growth in quality adjusted labour input in each industry between 2006 and 2011, for migrants and for non-migrants. These QALI growth estimates can be split into contributions from growth in hours worked and from increases in skill.

The higher skill components for each industry are shown in Figure 4.16.

The stand-out contributions are in the financial sector, from both non-migrants and migrants. Thereafter, the main skill contributions from migrants are in Wholesale trade, Information media & telecommunications (IMT), Health, Electricity gas water & waste services (EGWWS) and Manufacturing.

Migrants contributed substantially more than non-migrants to skills in IMT, Health and EGWWS. The health sector, in particular, is an area in which skill shortages have been filled by migrants over the 5-year period examined.

Figure 4-12 Skill composition contributions from migrants and non-migrants by industry

Source: Author estimates based on unpublished ABS data
Turning to the industry allocation of migrants, there was expansion in migrant work in two high skill contribution areas—Health and EGWWS. On the other hand, there was a fall in allocation of migrant work to the manufacturing sector, which has been a high migrant skill contribution sector.

The reallocation of migrant labour away from manufacturing seems appropriate, given the decline in employment in the industry. This case highlights that factors other than skill are relevant to the industry allocation of migrants.

The area of industry allocation and effects on national productivity warrants further investigation.

4.5.3 Productivity contributions

The migrant skill contributions translate directly into contributions to labour productivity growth (based on an hours worked measure). They can also be used to estimate the contributions to MFP growth, by scaling by the labour income share for each industry (see Box 4.1).

The MFP contribution estimates are presented in Figure 4.13. Given that Health, Education and Public Administration are outside the market sector, there are no labour income share estimates for these industries.

The results are similar in pattern to the skill contributions. Migrant contributions to annual MFP growth are above 0.25 of a percentage point in the financial, IMT and wholesale sectors. (The recorded rates of MFP growth between 2005-06 and 2010-11 were 2.3, 1.2 and -0.5 per cent a year respectively. These figures are the annual average growth rates over the 5-year interval for the three industries.) Migrant contributions were around 0.2 of a percentage point to annual MFP growth in manufacturing and EGWWS (which recorded MFP growth rates of -0.2 and -5.0 per cent a year respectively).
4.6 Regional dimension

The ABS also provided data that allowed upskilling to be assessed in a broad regional dimension—in metropolitan and regional pools of employed migrants and Australian-born. Metropolitan areas were defined to cover the greater capital city statistical areas.

The results show that upskilling among migrants was stronger in metropolitan areas than in regional areas (Figure 4.14). The skill composition component contributed 0.67 of a percentage point to annual growth in QALI in metropolitan areas, but 0.43 of a percentage point in regional areas. The figure also shows that there was a relatively small change in migrants’ experience or age contribution, whereas most of the shift to less experience (or younger age) that was noted previously occurred in non-metropolitan areas.

The difference between growth in migrant and non-migrant skills, noted earlier, occurred in the metropolitan areas, where migrants’ annual contribution of 0.67 of a percentage point compares with an Australian-born contribution of 0.54 of a percentage point. The skill composition change of migrants and non-migrants in regional areas was almost identical in size.
Figure 4-14 Skill composition contributions to QALI in metropolitan and regional areas

Source: Author estimates based on unpublished ABS data
4.7 Key point summary

- There have been three distinct periods in Australia’s productivity performance over the past three decades:
  - a period of baseline productivity growth from 1984-85 to 1993-94;
  - a surge in productivity growth from 1993-94 to 2003-04; and
  - a productivity growth slump from 2003-04.
- Other factors over the past two decades have swamped any influence that migration may have had on Australia’s productivity performance.
- Work performed by migrants is more skilled on average than work performed by the Australian-born.
- Wage rates do not differ substantially between migrants and non-migrants in the same skill categories, although migrant degree holders have been paid somewhat less than their Australian-born counterparts. Overall, because their work is more skilled, migrants enjoy a 6 per cent wage advantage over the Australian-born.
- The ABS quality-adjusted labour input (QALI) methodology has been used in this chapter to assess the contribution of migration, in a statistical accounting sense, to an increase in workforce skills and to productivity growth between 2006 and 2011.
- While the analysis does not reveal the contribution of migration over the long term, it does show that migration has played an important role in labour market flexibility by helping to meet increased requirements for skill.
- Migrant labour input has grown more rapidly than input from the Australian-born, in terms of both hours worked and skill. The migrants’ increase in skill has come about solely from growth in qualifications, whereas upskilling of work for the Australian-born has come from a combination of increased qualifications and more workforce experience.
- Migrant workers have become younger on average, to some extent offsetting the ageing of the Australian workforce.
- The QALI methodology suggests that migrants have met a third of the increase in skill requirements of work in the market sector.
- Migrants account for about 0.17 of a percentage point of annual labour productivity growth (about 7 per cent in proportion to the long term average rate of labour productivity growth) and 0.1 of a percentage point of annual MFP growth (about 10 per cent in proportion to the long-term average rate).
- Migrants are more highly represented than their Australian-born counterparts in manufacturing, in healthcare and social assistance and in professional, scientific and technical services.
- Migrants contributed to increased skills in all broad industry groups, but especially in financial and insurance services, wholesale trade, and the information, media and telecommunications industries. These industries are where migrants made the largest contributions to industry productivity growth.
- Most of the migrant upskilling occurred in metropolitan areas, whereas the shift to less experience (younger age) mostly occurred in regional areas.
- The more-rapid upskilling of migrants, in comparison to the Australian-born, occurred in metropolitan areas. The skill contributions of migrants and non-migrants were identical in regional areas.
Annex: Methodology for QALI indexes by migrant status

The ABS provided QALI indexes and associated data for migrants and non-migrants. This Annex sets out the methodology used. The Annex is an edited version of material provided by the ABS.

The task

QALI indexes are calculated for migrants and non-migrants for each industry and two industry aggregates (the whole economy and the market sector). For each QALI index, the corresponding workforce is classified by highest level of education and by age cohort (a proxy for experience). Gender is not used.

QALI methodology

The workforce of industry i and with migrant status m is split into groups based on educational attainment and age cohort. There are four levels of education (Higher Degree, Bachelor Degree, Skilled Labour, and Unqualified) and five age cohorts (15 to 24 years, 25 to 34 years, 35 to 44 years, 45 to 54 years, and 55 to 64 years).

Let $H_{a,e,t}$ be the number of hours worked by people in age cohort $a$, with education level $e$, in year $t$, and let $W_{a,e,t}$ be the income of people in age cohort $a$, with education level $e$, in year $y$. Then the QALI index is defined to be

$$\frac{Q_t}{Q_{t-1}} = \prod_{a,e} \left( \frac{H_{a,e,t}}{H_{a,e,t-1}} \right)^{W_{a,e,t} \cdot S_{a,e,t} / \sum_{a,e} W_{a,e,t}}$$

where

$$S_{a,e,t} = \frac{W_{a,e,t}}{\sum_{a,e} W_{a,e,t}}$$

is the income share of people in age cohort $a$, with education level $e$, in year $t$.

The hours worked index for industry $i$ and migrant status $m$ is $H_t / H_{t-1}$, where

$$H_i = \sum_{a,e} H_{a,e,t}$$

The contribution of the changes in age and education composition to the QALI index $Q_t / Q_{t-1}$ is then given by

$$\Delta_i = \frac{Q_t}{Q_{t-1}} / \left( \frac{H_t}{H_{t-1}} \right)$$

The $\Delta_i$'s are called the compositional changes. They can be calculated directly by using hours worked shares instead of hours worked estimates in the above equation for QALI:
\[
\frac{\Delta_c}{\Delta_{t-1}} = \prod_{a,e} \left( \frac{H_{a,e,t}}{H_{a,e,t-1}} \right)^{1/2} \left( \frac{S_{a,e,t} + S_{a,e,t-1}}{2} \right)
\]

The compositional changes can be further decomposed into partial composition changes depending on only one characteristic (either age cohort or education).

Typically, the ABS does not use the Census data to estimate the hours worked index. Instead, the hours worked indexes from the Labour Force Survey are used. Note that the LFS industry hours worked indexes can be adjusted, using the Census data to obtain hours worked indexes for migrants and non-migrants.

Let \( H_{m,t} \) be the hours worked by migrants. Then

\[
\frac{H_{m,t}}{H_{m,t-1}} = \left( \frac{H_{m,t}}{H_{t}} \right) \times \left( \frac{H_{t}}{H_{t-1}} \right)
\]

The term \( \frac{H_{m,t}}{H_{t}} \) is the share of hours worked for migrants which can be estimated from the Census data and \( \frac{H_{t}}{H_{t-1}} \) is the hours worked index which can be estimated using the LFS data.

**Using the Census data**

Industry is determined by the Census variable INDP (IND06P in 2006) while migrant status is determined using the variable BPLP (Country of Birth of Person). Specifically, a person is considered to be non-migrant if BPLP (to two digits) is 11—Australia (includes External Territories) and otherwise is considered to be migrant.

Age is determined using the variable AGEP while educational attainment is determined using the variable QALLP (Non-School Qualification: Level of Education). The table below shows how QALLP is used to determine the education levels.

<table>
<thead>
<tr>
<th>QALI Education Level</th>
<th>QALLP Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher Degree</td>
<td>1 Postgraduate Degree Level</td>
</tr>
<tr>
<td></td>
<td>2 Graduate Diploma and Graduate Certificate Level</td>
</tr>
<tr>
<td>Bachelor Degree</td>
<td>3 Bachelor Degree Level</td>
</tr>
<tr>
<td>Skilled Labour</td>
<td>4 Advanced Diploma and Diploma Level</td>
</tr>
<tr>
<td></td>
<td>5 Certificate Level</td>
</tr>
<tr>
<td>Unqualified</td>
<td>All other values</td>
</tr>
</tbody>
</table>

Hours worked estimates are obtained by multiplying an employment estimate (from LFSP) by an average hours worked estimate (from HRSP). Similarly, the income estimates are obtained by multiplying the employment estimate from LFSP by an average income estimate (from INCP).

The employment estimates are the sum of the items 1—Employed, worked full-time, 2—Employed, worked part-time, and 3—Employed, away from work from LFSP.
In 2011, the average (weekly) hours worked estimate is given by $\frac{\sum_{h=1}^{99} hP_h}{\sum_{h=1}^{99} P_h}$, where $P_h$ is the number of people working $h$ hours per week from HRSP. In 2006, hours worked data is only available in the ranges 1-15, 16-24, 25-34, 35-39, 40, 41-48, and 49+. Thus, average weekly hours worked is estimated as

$$\frac{(8P_{1-15} + 20P_{16-24} + 30P_{25-34} + 37P_{35-39} + 40P_{40} + 45P_{41-48} + 55P_{49+})}{P_{1-15} + P_{16-24} + P_{25-34} + P_{35-39} + P_{40} + P_{41-48} + P_{49+}}$$

where $P_R$ is the number of people whose hours worked falls in the range $R$.

The income data INCP is also given in ranges. In 2011, average weekly income is estimated as

$$\frac{(100P_{1-149} + 250P_{150-499} + 350P_{500-999} + 500P_{1000-2499} + 700P_{2500-4999} + 900P_{5000-7499} + 1125P_{7500-9999} + 1375P_{10000-19999} + 1750P_{20000-29999} + 3000P_{30000+})}{P_{1-149} + P_{150-499} + P_{500-999} + P_{1000-2499} + P_{2500-4999} + P_{5000-7499} + P_{7500-9999} + P_{10000-19999} + P_{20000-29999} + P_{30000+}}$$

In 2006 average weekly income is estimated as

$$\frac{(75P_{1-149} + 200P_{150-499} + 325P_{500-999} + 500P_{1000-2499} + 700P_{2500-4999} + 900P_{5000-7499} + 1150P_{7500-9999} + 1450P_{10000-19999} + 1800P_{20000-29999} + 3000P_{30000+})}{P_{1-149} + P_{150-499} + P_{500-999} + P_{1000-2499} + P_{2500-4999} + P_{5000-7499} + P_{7500-9999} + P_{10000-19999} + P_{20000-29999} + P_{30000+}}$$

Data imputation

Using the classifications above, there are a few cases of insufficient data. Instead of broadening the groups (e.g. using larger and fewer age cohorts) values have been imputed. These values are given in the table below.
<table>
<thead>
<tr>
<th>Year</th>
<th>Age Cohort</th>
<th>Education Level</th>
<th>Industry</th>
<th>Migrant Status</th>
<th>Imputation</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>15 to 24</td>
<td>Higher Degree</td>
<td>A</td>
<td>Non-migrant</td>
<td>Average income = 515</td>
<td>Same as equivalent value for Migrant</td>
</tr>
<tr>
<td>2011</td>
<td>15 to 24</td>
<td>Higher Degree</td>
<td>A</td>
<td>Non-migrant</td>
<td>Average hours = 40</td>
<td>Same as equivalent value for Migrant</td>
</tr>
<tr>
<td>2006</td>
<td>15 to 24</td>
<td>Higher Degree</td>
<td>A</td>
<td>Both</td>
<td>Average income = 500</td>
<td>Based on corresponding 2011 value for Migrant</td>
</tr>
<tr>
<td>2006</td>
<td>15 to 24</td>
<td>Higher Degree</td>
<td>D</td>
<td>Non-migrant</td>
<td>Employment = 24</td>
<td>Same as equivalent 2011 value</td>
</tr>
<tr>
<td>2006</td>
<td>15 to 24</td>
<td>Higher Degree</td>
<td>D</td>
<td>Non-migrant</td>
<td>Average income = 648</td>
<td>Same as equivalent value for Migrant</td>
</tr>
<tr>
<td>2006</td>
<td>15 to 24</td>
<td>Higher Degree</td>
<td>D</td>
<td>Non-migrant</td>
<td>Average hours = 31</td>
<td>Same as equivalent value for Migrant</td>
</tr>
</tbody>
</table>

**Non–Census years**

Data for non-census years is interpolated by linearly interpolating the hours worked shares and the hourly income data.

**Industry aggregates**

QALI indexes for two industry aggregates are also calculated. The two industry aggregates are the whole economy (obtained by aggregating over all industries) and the market sector (obtained by aggregating over industries A, B, C, D, E, F, G, H, I, J, K, L, M, N, R, and S). The industry aggregates also use the imputed data.
5 MIGRANT DATA ANALYSIS

This chapter reports the findings from the modelling of migrants’ productivity and employment. The modelling responds to terms of reference: 6(a) on productivity differences between migrants and non-migrants; 6(b) on productivity differences between migrants from different visa streams and the Australian-born; and 6(f) on the effects of education and training on the productivity of migrants relative to the Australian-born.

We investigate factors that affect productivity and employment primarily through the human capital channel as set out in chapter 2.

The details of the modelling and the full results are presented in Appendix B. A non-technical overview of the modelling and results is presented here.

5.1 Model description

The principal approach was to analyse wages for different groups (migrants and non-migrants) on the assumption that relative wages (or wage premiums) reflect relative productivity (or productivity premiums). The finding that relative wages are a practical and reasonable approximation for relative productivity was discussed in Chapter 3.

In the modelling, we sought to explain wage differences in terms of migrant/non-migrant status and a range of characteristics, covering demography, education, English fluency and so on.

We also modelled employment and sought to explain the probability of being employed in terms of a similar set of variables.

We used data on individuals from a number of sources including:

1. The Household, Income and Labour Dynamics in Australia (HILDA): the HILDA survey is a household-based panel study which began in 2001. It collects information about economic and subjective well-being, labour market dynamics and family dynamics. Interviews are conducted annually with all adult members of each household. The panel members are followed over time. Wave 1 of the HILDA survey was conducted in 2001 and wave 13 was conducted in 2013. For the purpose of examining the differences in labour productivity and probability of being employed between migrants and non-migrants and assessing how these differences change over time, we used the data collected from the last three waves for the years 2011, 2012 and 2013 with nearly 12,000 observations. The reason for this choice was that the panel data for those three years included data from all of the top-up samples prior to wave 12, giving a reasonably large data set with richer information regarding migrants.

2. The Australian Population and Housing Census 2011: This data provides information on how many people there are in each part of Australia, what they do and how they live. The data records the details of all people (including visitors) who spent the night in each dwelling on Census Night, Tuesday, 9 August 2011.

3. The Continuous Survey of Australia’s Migrants (CSAM): CSAM measures the labour market integration of recently arrived migrants in the Skill and Family streams. Within the Skill stream, there are three main categories - Employer Sponsored, State Sponsored and Skilled Independent visas. Migrants taking part in the CSAM are surveyed on two occasions, at the 6
and 18 month stage of settlement, to capture changes in their labour market status. This then provides insights into the migrant integration process. Our analysis employed the data from the 6 months stage of the CSAM survey, run in October 2013 and which had a total of 8,756 migrants complete the survey.

4. The 2012 survey of subclass 457 employers and employees: The subclass 457 visa is a temporary work (skilled) employer sponsored visa. It allows businesses to access international labour markets for skills and technical expertise that might not otherwise be available in Australia. The survey of employees was conducted in June 2012 as an online survey, sent to 15,000 primary visa holders. At the conclusion of the survey, 3,812 valid responses had been received. The survey of current and lapsed employers commenced in late May 2012, using Computer Assisted Telephone Interviewing, with 1,500 and 100 responses respectively.

5. The survey of Australia’s Working Holiday Maker Program (WHM): The WHM 2008 survey included 20,444 WHMs and was conducted between late August to mid-October 2008. The sample accounted for 14.8 per cent of the total WHM arrivals in 2007-08. The surveyed population was all WHMs who came to Australia on a subclass 417 or subclass 462 visa and departed Australia between January 2007 and August 2008.

The analysis is grouped into two categories. In the first category, we regressed the hourly wage rate of each respondent in dollars per hour against a range of the respondent’s demographic characteristics as following:

\[
\text{Hourly wage} = f(\text{migrant and non-migrant status, birth country, English proficiency, education, industries, other characteristics})
\]

In the second category, we undertook probit estimation to estimate the probability of having been employed against a range of the respondent’s characteristics as following:

\[
P(\text{employed} = 1) = f(\text{migrant and non-migrant status, birth country, English proficiency, education, other characteristics})
\]

Throughout the report, variables at 1 per cent, 5 per cent and 10 per cent significance levels are represented by ***, ** and * next to their coefficients.

5.2 Migrants and non-migrants

We have provided the results of the general modelling of the differences between migrants (defined as being born in countries other than Australia) and non-migrants (defined as being born in Australia) in productivity, as indicated by wage rates, and employment.
5.2.1 Wages (productivity)

Table 5.1 reports the results from the wage equation using panel HILDA data for three years 2011-13. The Table shows that the hourly wage rates of both migrants and non-migrants have increased over time. The wage rates of migrants are higher than those of non-migrants in all three years from 2011 to 2013. It appears that over the three years, migrants’ hourly wage rate increases faster than non-migrants’ hourly wage rate. For example, if we compare a migrant and a non-migrant in year 2011, we see that a migrant earns about 3 dollars more per hour than a non-migrant. In year 2012, a migrant earns about 3.6 dollars more per hour than a non-migrant ($4.84 minus $1.19); and in 2013, a migrant earns about 5 dollars more per hour than a non-migrant ($6.84 minus $1.81).

Table 5-1 Differences in hourly wage rates between migrants and non-migrants

<table>
<thead>
<tr>
<th>HILDA 2011-2013: Marginal effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-migrant year 2011 (base)</td>
</tr>
<tr>
<td>Non-migrant year 2012</td>
</tr>
<tr>
<td>Non-migrant year 2013</td>
</tr>
<tr>
<td>Migrant year 2011</td>
</tr>
<tr>
<td>Migrant year 2012</td>
</tr>
<tr>
<td>Migrant year 2013</td>
</tr>
</tbody>
</table>

Overall, based on panel data from HILDA for the three years 2011 to 2013, the modelling suggests:

- migrants with otherwise similar characteristics to non-migrants have been more productive;
  - the migrant premium for an hour of work was 5 dollars or about 15 per cent of the average hourly wage of non-migrants in 2013;
- migrants, as a group, increased productivity more rapidly than non-migrants;
  - the 2013 premium (of $5 per hour) had risen from 3 dollars or 10 per cent of the average hourly wage of non-migrants in 2011.

Country of origin

Table 5.2 represents the differences in hourly wage rates between non-migrants and migrants being born in different groups of countries using HILDA 2013 data. The Table shows that country of origin of migrants makes a difference. The modelling suggests that with otherwise similar characteristics:

- there is no significant difference in hourly wage rates between non-migrants and migrants born in non-English speaking countries;
- migrants born in English speaking countries earn about 8 dollars more per hour or a wage/productivity premium of 24 per cent of the average hourly wage of non-migrants in 2013;
- there is no significant difference in hourly wages between non-migrants and migrants born in non-OECD countries;
- migrants born in OECD countries earned nearly 7 dollars more per hour than the Australian-born.
Table 5-2 Birth countries and marginal effects on hourly wage rates

<table>
<thead>
<tr>
<th>HILDA 2013: Marginal Effect</th>
<th>$/hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrant born in non-English speaking countries (base)</td>
<td>---</td>
</tr>
<tr>
<td>Migrant born in English speaking countries</td>
<td>8.17**</td>
</tr>
<tr>
<td>Non-migrant</td>
<td>-0.05</td>
</tr>
<tr>
<td>Migrant born in non-OECD countries (base)</td>
<td>---</td>
</tr>
<tr>
<td>Migrant born in OECD countries</td>
<td>6.77</td>
</tr>
<tr>
<td>Non-migrant</td>
<td>-0.53</td>
</tr>
</tbody>
</table>

Table 5.3 summarises the hourly wage rates for different groups of respondents using HILDA 2013 data. The table shows that there was little difference between the hourly wage of non-migrants, migrants born in non-English speaking countries and migrants born in non-OECD countries. However, migrants born in English speaking countries and migrants born in OECD countries earn substantially more.

Table 5-3 Summary statistics of hourly wage rate

<table>
<thead>
<tr>
<th>HILDA 2013: Hourly wage rate</th>
<th>Mean $/hour</th>
<th>Median $/hour</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-migrants</td>
<td>31</td>
<td>26</td>
<td>7934</td>
</tr>
<tr>
<td>Migrants born in non-English speaking countries</td>
<td>32</td>
<td>28</td>
<td>1091</td>
</tr>
<tr>
<td>Migrants born in English speaking countries</td>
<td>40</td>
<td>31</td>
<td>859</td>
</tr>
<tr>
<td>Migrants born in OECD countries</td>
<td>39</td>
<td>31</td>
<td>988</td>
</tr>
<tr>
<td>Migrants born in non-OECD countries</td>
<td>32</td>
<td>28</td>
<td>962</td>
</tr>
</tbody>
</table>

Table 5.4 represents the differences between migrants and non-migrants in the amount of Family Tax Benefit and total government financial support that they received in a financial year using HILDA 2013 data. The Table shows that:

- there was no significant difference between non-migrants and migrants coming from non-English speaking countries in requiring government income support;
- migrants coming from English-speaking countries required less financial support from the government. Compared to non-migrants, migrants coming from English-speaking countries
  - received about 300 dollars less in Family Tax Benefit in 2013;
  - received about 700 dollars less in total government financial support in 2013.
Table 5-4 Differences between migrants and non-migrants in family tax benefit and total government financial support

<table>
<thead>
<tr>
<th>HILDA 2013 data</th>
<th>Family tax benefit $/year</th>
<th>Government financial support $/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-migrants (base)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Migrants born in non-English speaking countries</td>
<td>219</td>
<td>348</td>
</tr>
<tr>
<td>Migrants born in English speaking countries</td>
<td>-289***</td>
<td>-696**</td>
</tr>
</tbody>
</table>

Overall, the results indicated that migrants, especially those who come from English-speaking countries and OECD countries, are more productive than non-migrants. Furthermore, with higher incomes on average, migrants contribute to higher tax revenue and require less financial assistance from government.

**English proficiency**

Based on HILDA 2011-2013 data for both migrants and non-migrants and CSAM 2013 data for migrants, the modelling suggested:

- respondents who are more fluent in English are more productive, as measured by their hourly wage;
- compared to respondents who stated that they speak English well or do not speak English well or do not speak English at all:
  - respondents who stated that they speak English *very well* earned about 4 to 5 dollars (or 16 to 19 per cent) more per hour in the period 2011-2013;
  - respondents with English as the only language spoken earned about 6 dollars (or 23 per cent) more per hour in the period 2011-2013.

**Education**

Migrants are more likely to have university education than non-migrants—34 per cent of migrants have a bachelor or post graduate degree, compared to 22 per cent of non-migrants. Results from HILDA 2011-2013 for both migrants and non-migrants and from CSAM 2013 data for migrants suggest:

- respondents with higher levels of education were more productive, as measured by hourly wage;
- compared with respondents who do not have a university degree:
  - the wage premiums for an hour of work of respondents having a bachelor degree and respondents having a post graduate degree were 8 dollars and 12 dollars (or 27 per cent and 41 per cent), respectively, in the period 2011-2013;
  - the wage premium in 2013 for an hour of work of migrants with an Australian PhD was 17 dollars or 67 per cent higher compared to migrants without an Australian PhD ;
- whether migrants’ highest qualification was an Australian qualification or an overseas qualification did not affect the productivity of migrants;
- migrants with an overseas post school qualification were more productive than migrants without an overseas post school qualification.
Table 5.5 Having university education

<table>
<thead>
<tr>
<th>HILDA 2013 data</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having a bachelor or post graduate degree:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-migrants</td>
<td>22</td>
<td>78</td>
<td>13666</td>
</tr>
<tr>
<td>Migrants</td>
<td>34</td>
<td>66</td>
<td>3829</td>
</tr>
</tbody>
</table>

Industry of employment
Based on HILDA 2011-2013 data for temporary and permanent migrants and non-migrants, CSAM 2013 data for permanent migrants, and a 457 visa survey in 2012 for temporary skilled migrants, the modelling suggested:

• compared to respondents working in Public Administration, Education and Training, and Health Care and Social Assistance, in the period 2011-2013
  o the wage premium for an hour of work of migrants and non-migrant respondents working in the Mining Industry was about 11 dollars (or 31 per cent);
  o the wage premium for an hour of work of respondents working in Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, and Arts and Recreation services was between 4 and 6 dollars (or 11-17 per cent);
  o hourly wages of respondents working in Agriculture, Forestry and Fishing was about 6 dollars (or 17 per cent) less;
  o respondents working in Retail Trade, Accommodation and Food Services, Administrative and Support Services earned between 4 and 7 dollars (or 11-20 per cent) less per hour;
  o hourly wages of respondents working in Manufacturing, Electricity, Gas, Water, and Waste Services, Construction, Wholesale Trade, Transport, Postal and Warehousing appears to be not significantly different from that of respondents working in Public Administration;
• compared to respondents working in Public Administration, Education and Training, and Health Care and Social Assistance, in 2012
  o migrants working in the Mining Industry and in Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, Arts and Recreation Services, were more likely to have a high income, defined as having income more than 100,000 dollars a year;
  o migrants working in Retail Trade, Accommodation and Food Services, Administrative and Support Services, and Other Services, were less likely to be in a high income group.

Other demographic characteristics
Other demographic characteristics are also found to affect productivity. Findings from HILDA 2011-13 data for both migrants and non-migrants and CSAM 2013 data for migrants suggest:
• men have a higher hourly wage than women;
• productivity increased with age and experience;
• respondents having supervising duty or having internet at home are more productive;
• living in major urban areas and in areas with higher Socio-Economic Indexes for Areas (SEIFA) index of socio-economic advantages (which is an index developed by the ABS that ranks areas in Australia by relative socio-economic advantage) increased the hourly wage;
• respondents with health conditions and who have a duty to care for other members in the family have lower wages;
• being a business owner is found to be insignificant in affecting respondents’ hourly wage.

5.2.2 Probability of employment:

Country of origin

Based on Census data for the year 2011 and panel data from HILDA for the three years 2011 to 2013, the modelling suggested:

• In 2011: compared to migrants coming from non-English speaking countries
  o non-migrants were about 2 per cent more likely to be employed;
  o migrants born in English speaking countries were about 1 per cent more likely to be employed;
• In 2013
  o there was no significant difference in the likelihood of being employed between non-migrants, migrants born in English speaking countries, and migrants born in non-English speaking countries;
  o there was no significant difference in the likelihood of having a job between non-migrants and migrants born in non-OECD countries as well as migrants born in OECD countries.

Table 5.6 represents the unemployment rates for non-migrants and migrants using Census 2006, Census 2011 and HILDA 2013 data. It shows the unemployment rates of non-migrants and migrants appear to converge over time. The unemployment rate of migrants in 2006 was somewhat higher than that of non-migrants, but the unemployment rates in 2011 and 2013 were about the same for these two groups of respondents. This might be explained by shifts in immigration policies that better reflect labour market shortages, such that immigrants are less likely to be unemployed after entering Australia.

Table 5-6 Unemployment rates for migrants and non-migrants

<table>
<thead>
<tr>
<th></th>
<th>Unemployment rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Census 2006</td>
</tr>
<tr>
<td></td>
<td>Non-migrant</td>
</tr>
<tr>
<td>Non-migrant</td>
<td>4.89</td>
</tr>
</tbody>
</table>
Table 5.7 represents the unemployment rates of migrants and non-migrants in 2006 and 2011 from the whole Census data. The results show that for the whole nation, the unemployment rate remained the same at the level of 5.15 per cent for 2006 and 2011. Unemployment rates of migrants were slightly higher than the unemployment rates of non-migrants in both 2006 and 2011. In 2006, the unemployment rate of migrants (which was 5.98 per cent) was more than 1 per cent higher than the unemployment rate of non-migrants (which was 4.89 per cent). In 2011, the unemployment rate of migrants, improved and reduced to 5.23 per cent while the unemployment rate of non-migrants increased slightly to 5.12 per cent.

The unemployment rates were lowest in the Australian Capital Territory and Western Australia, and highest in Tasmania. In 2011, the unemployment rates were highest in Tasmania for both migrants (7.23 per cent) and non-migrants (6.23 per cent).

### Table 5-7 Unemployment rate from Census data 2006 and 2011

<table>
<thead>
<tr>
<th>States and Territories</th>
<th>Non-migrants</th>
<th>Migrants</th>
<th>Both migrants and non-migrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>New South Wales</td>
<td>5.56</td>
<td>5.36</td>
<td>6.54</td>
</tr>
<tr>
<td>Victoria</td>
<td>4.72</td>
<td>4.64</td>
<td>6.98</td>
</tr>
<tr>
<td>Queensland</td>
<td>4.52</td>
<td>5.58</td>
<td>5.32</td>
</tr>
<tr>
<td>South Australia</td>
<td>5.09</td>
<td>5.20</td>
<td>5.57</td>
</tr>
<tr>
<td>Western Australia</td>
<td>3.61</td>
<td>4.50</td>
<td>3.97</td>
</tr>
<tr>
<td>Tasmania</td>
<td>6.86</td>
<td>6.23</td>
<td>5.56</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>4.41</td>
<td>6.00</td>
<td>2.43</td>
</tr>
<tr>
<td>ACT</td>
<td>3.09</td>
<td>3.35</td>
<td>4.11</td>
</tr>
<tr>
<td><strong>Australia</strong></td>
<td><strong>4.89</strong></td>
<td><strong>5.12</strong></td>
<td><strong>5.98</strong></td>
</tr>
</tbody>
</table>

**English proficiency**

Based on Census 2011 data and HILDA 2011-2013 data for both migrants and non-migrants, and CSAM 2013 data for migrants, the modelling suggested:

- respondents who are more fluent in English were more likely to be employed;
- compared to respondents who stated that they speak English well or do not speak English well or do not speak English at all
  - Census and HILDA data show:
    - respondents who stated that they speak English very well were about 2 per cent more likely to have a paid job;
    - respondents with English as the only language spoken were about 3 to 5 per cent more likely to be employed.
  - CSAM data shows:
    - respondents who speak English very well were about 8 per cent more likely to have a paid job;
    - respondents with English as the only language spoken were about 10 per cent more likely to be employed;
The larger effect of English proficiency on the likelihood of being employed in CSAM data can be explained by the fact that CSAM 2013 survey only includes migrants who had either arrived or were granted their permanent residence visas around six months ago. Therefore, the length of time that they had been in Australia is likely to be relatively short and, thus, English proficiency would have been more important and had a stronger effect on the likelihood of getting a job. HILDA and Census data includes migrants who had been in Australia and in the labour market for a longer period of time and, thus, they would be more able to find a job even if they are not fluent in English.

**Education**

Results from Census 2011 and HILDA 2011-13 data for both migrants and non-migrants, and from CSAM 2013 data for migrants, suggest:

- respondents with a university qualification were more likely to be employed;
  - respondents having a bachelor or a postgraduate degree were about 1 to 2 per cent more likely to be employed;
- highest qualification being an Australian qualification increased the likelihood of being employed;
- having an overseas post school qualification did not increase the likelihood of having a job.

Regarding the effects of migrants’ fields of study on the probability of having a paid job, the modelling suggested:

- migrants whose fields of study had been health and education were more likely to be employed than migrants with other fields of study or migrants without tertiary education.

**Other demographic characteristics**

Using Census 2011, HILDA 2011-13 and CSAM 2013 data, other demographic characteristics found to affect the respondents’ probability of being employed include:

- males were more likely to have a paid job than females;
- age of the respondent increased the probability of having a paid job, but its marginal effect gets smaller as age increases;
- having internet at home, years having been in Australia and living in areas with a higher SEIFA index of socio-economic advantage increased the likelihood of having a paid job; and
- having health conditions, having duty to care for other members or children in the family, and studying full time or part time reduced the probability of having a paid job.

### 5.3 Skilled migration categories vs. family dependent

This sub-section reports the differences in productivity and employment between migrants’ groups using CSAM 2013 data which covers Permanent migrants in the Family and Skill visa streams. Within the Skill stream, there are three categories including Employer Sponsored, State Sponsored and Skilled Independent visas. The modelling showed:
• Migrants on skilled visas were more productive than migrants on family visas;
• The probability of having a paid job was significantly higher for migrants on an Employer sponsored visa than for migrants on State sponsored, Skilled Independent and Family dependent visas;
• The probability of being employed was not much different between migrants on a State sponsored visa and migrants on a Skilled Independent visa.
• Compared to migrants coming to Australia on family dependent visas,
  o The hourly wage of Employer or State sponsored migrants was about 7 dollars (or 50 per cent) higher;
  o The hourly wage of migrants on Skilled Independent visa was about 3 dollars (or 21 per cent) higher;
  o Migrants on Employer sponsored visa were about 31 per cent more likely to be employed;
  o Migrants on State sponsored visas and Skilled Independent visas were about 20 per cent more likely to be employed.

In terms of where the visa is granted, migrants who received an onshore visa earned about 2 dollars (or 8 per cent) more per hour and were about 9 per cent more likely to be employed than migrants who were granted an offshore visa.

Table 5.8 represents the hourly wage rates for different visa categories. Migrants on Employer or State sponsored visas earned the highest hourly wage ($36 per hour), migrants on Skilled Independent visa earned 32 dollars per hour and migrants on Family dependent visa earned 27 dollars per hour, on average. (There is no benchmark for non-migrants from CSAM 2013 as the dataset only contains data on migrants. As a rough comparison, HILDA 2013 shows non-migrants have a mean hourly wage of $31 and a median hourly wage of $26.)

Table 5-8 Summary statistics of hourly wage rates for different visa categories

<table>
<thead>
<tr>
<th>Visa category: CSAM 2013</th>
<th>Mean $/hour</th>
<th>Median $/hour</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrants on Family dependent visa</td>
<td>27</td>
<td>22</td>
<td>1079</td>
</tr>
<tr>
<td>Migrants on Employer or State sponsored visas</td>
<td>36</td>
<td>29</td>
<td>2408</td>
</tr>
<tr>
<td>Migrants on Skilled Independent visa</td>
<td>32</td>
<td>27</td>
<td>2373</td>
</tr>
</tbody>
</table>

Table 5.9 reports the unemployment rates for different visa categories. The Table shows that the unemployment rate was much lower for migrants on the Employer sponsored visa. Unemployment rates were similar between migrants on Stated sponsored visas and Skilled Independent visas, and highest for migrants on Family dependent visas.
Table 5-9 Unemployment rates for different visa categories: CSAM 2013

<table>
<thead>
<tr>
<th>Visa category</th>
<th>Unemployment rate (%)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrants on Family dependent visas</td>
<td>42</td>
<td>2278</td>
</tr>
<tr>
<td>Migrants on Employer sponsored visas</td>
<td>2.7</td>
<td>1729</td>
</tr>
<tr>
<td>Migrants on State sponsored visas</td>
<td>13</td>
<td>1288</td>
</tr>
<tr>
<td>Migrants on Skilled Independent visas</td>
<td>14</td>
<td>3168</td>
</tr>
</tbody>
</table>

5.4 **457 Visa: employees and employers**

We now turn to temporary migrants. The following sections cover three types of temporary migrants - Temporary Work (skilled) (457) visas, Working Holiday Makers and International Students. This subsection reports the results from 457 visa survey data in 2012 for employees and employers.

5.4.1 **Employees and income groups**

*English proficiency*

The modelling indicates that:

- 457 visa migrants who were more fluent in English were more productive;
- compared to the 457 visa migrants who have difficulty in English,
  - 457 visa migrants whose background is English were about 15 per cent more likely to have a high income defined as more than 100,000 dollars per year;
  - 457 visa migrants who are good at English were about 7.5 per cent more likely to have an income in excess of 100,000 dollars per year.

*Other demographic characteristics*

Other demographic characteristics found to affect the likelihood of having high income include:

- a male was about 12 per cent more likely to have a high income than a female;
- increasing age raises the probability of having a high income;
- 457 visa migrants who have provided training to other workers in their company were about 5 per cent more likely to have a high income.

5.4.2 **Employees and the likelihood of having training duty at work**

Whether employees train others at work is one indicator that they may be contributing to the productivity of other workers. The modelling indicates that:

- the 457 visa migrants for whom English is their first language were about 3 per cent more likely to have trained other workers at their company;
- a male was 7 per cent more likely to have training duty than a female;
- the likelihood of having training duty increased with age of the 457 visa migrant;
• one more year living in Australia increased the probability of having training duty by about 14 per cent.

5.4.3 Employers and satisfaction with 457 visa program

Employers were asked about their experience of hiring in the local market and whether 457 visa holders helped in the training and development of Australian-born workers. The latter question is one possible indicator of how migrants might contribute to the productivity of non-migrants.

Table 5.10 reports the number of firms that faced difficulty in hiring workers from the local labour market. Out of 1,478 firms in the survey, 43 per cent stated that it was very difficult for them to hire workers from the local labour market, and a further 41 per cent of the firms found it somewhat difficult.

Table 5-10 Difficulty in hiring workers from local market

<table>
<thead>
<tr>
<th>Number of firms</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very difficult</td>
<td>636</td>
</tr>
<tr>
<td></td>
<td>43</td>
</tr>
<tr>
<td>Somewhat difficult</td>
<td>609</td>
</tr>
<tr>
<td></td>
<td>41</td>
</tr>
<tr>
<td>Not difficult</td>
<td>233</td>
</tr>
<tr>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>1478</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

The data shows that:

• the job categories that firms had the most difficulty in hiring people were professionals, technicians and trade workers, and managers;
• out of 1,502 employers in the survey:
  o 55 per cent found difficulties in hiring workers because there were not enough local workers with the right skills;
  o 9 per cent found difficult in hiring workers because the business is in a remote location;
  o 95 per cent of the firms stated that they did have benefits from sponsoring overseas workers;
• Out of 1,353 employers, 77 per cent stated that 457 visa workers did help in the training and development of Australian workers. This implies that, potentially, migrants contribute to increasing the productivity of non-migrants.
5.5 Working holiday makers

This section reports the results related to the Working Holiday Maker Program survey (WHM) in 2008. As data in 2008 is also available from HILDA for temporary and permanent migrants and non-migrants, the following sub-section provides a comparison in wages between WHM, temporary and permanent migrants and non-migrants in 2008.

5.5.1 Comparison in wages between WHM, permanent migrants and non-migrants

Table 5.11 provides the mean and median hourly wage rates of temporary migrants on the Working Holiday Maker program in 2008 in comparison to equivalent data from the 2008 HILDA survey. The results show that for Australia as a whole, as well as for each group of industries, the hourly wage rates of temporary migrants on the Working Holiday Maker program were much lower than the average hourly wage rates of all migrants and of non-migrants. On average, the mean of the hourly wage rate of temporary migrants is 16 dollars per hour, while the mean of the hourly wage rate of all migrants was 29 dollars per hour and that of non-migrants was 26 dollars per hour.

Table 5-11 Hourly wage rate of WHM, all migrants and non-migrants in 2008

<table>
<thead>
<tr>
<th>Hourly wage rate</th>
<th>Mean %/hour</th>
<th>Median %/hour</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Australia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary migrants (WHM 2008)</td>
<td>16</td>
<td>16</td>
<td>20443</td>
</tr>
<tr>
<td>All migrants (HILDA 2008)</td>
<td>29</td>
<td>24</td>
<td>1344</td>
</tr>
<tr>
<td>Non-migrants (HILDA 2008)</td>
<td>26</td>
<td>22</td>
<td>6265</td>
</tr>
<tr>
<td><strong>Industry group 1:</strong> Agriculture, Forestry, Fishing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary migrants (WHM 2008)</td>
<td>15</td>
<td>15</td>
<td>5461</td>
</tr>
<tr>
<td>All migrants (HILDA 2008)</td>
<td>19</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>Non-migrants (HILDA 2008)</td>
<td>20</td>
<td>17</td>
<td>134</td>
</tr>
<tr>
<td><strong>Industry group 2:</strong> Mining</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary migrants (WHM 2008)</td>
<td>24</td>
<td>22</td>
<td>176</td>
</tr>
<tr>
<td>All migrants (HILDA 2008)</td>
<td>40</td>
<td>39</td>
<td>19</td>
</tr>
<tr>
<td>Non-migrants (HILDA 2008)</td>
<td>40</td>
<td>36</td>
<td>118</td>
</tr>
<tr>
<td><strong>Industry group 3:</strong> Manufacture</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary migrants (WHM 2008)</td>
<td>17</td>
<td>17</td>
<td>2655</td>
</tr>
<tr>
<td>All migrants (HILDA 2008)</td>
<td>26</td>
<td>23</td>
<td>348</td>
</tr>
<tr>
<td>Non-migrants (HILDA 2008)</td>
<td>26</td>
<td>23</td>
<td>1487</td>
</tr>
<tr>
<td><strong>Industry group 4:</strong> Retail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary migrants (WHM 2008)</td>
<td>15</td>
<td>15</td>
<td>13407</td>
</tr>
<tr>
<td>All migrants (HILDA 2008)</td>
<td>22</td>
<td>19</td>
<td>256</td>
</tr>
<tr>
<td>Non-migrants (HILDA 2008)</td>
<td>18</td>
<td>17</td>
<td>1521</td>
</tr>
<tr>
<td><strong>Industry group 5:</strong> Informatics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary migrants (WHM 2008)</td>
<td>21</td>
<td>19</td>
<td>1673</td>
</tr>
<tr>
<td>All migrants (HILDA 2008)</td>
<td>39</td>
<td>28</td>
<td>265</td>
</tr>
<tr>
<td>Non-migrants (HILDA 2008)</td>
<td>30</td>
<td>24</td>
<td>1023</td>
</tr>
<tr>
<td><strong>Industry group 6:</strong> Public Administration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary migrants (WHM 2008)</td>
<td>21</td>
<td>20</td>
<td>1320</td>
</tr>
<tr>
<td>All migrants (HILDA 2008)</td>
<td>32</td>
<td>28</td>
<td>433</td>
</tr>
<tr>
<td>Non-migrants (HILDA 2008)</td>
<td>28</td>
<td>25</td>
<td>1919</td>
</tr>
</tbody>
</table>
5.5.2 Assessing probability of taking farm work

Results from modelling the probability of taking farm work suggest that:

• compared to WHMs who do not speak English well or do not speak English at all,
  o WHMs who speak English best were 17 per cent less likely to take farm work;
  o WHMs who speak English very well and who speak English well were about 12 per cent and 4.5 per cent less likely to take farm work, respectively;
• Temporary WHM migrants having a university qualification were about 10 per cent less likely to do farm work compared to temporary migrants without university education;
• males were about 2.6 per cent more likely to do farm work than females;
• WHMs whose reason for visiting Australia was to work were about 2 per cent more likely to do farm work;
• WHMs who had visited Australia before were about 10 per cent less likely to choose farm work.

5.6 Comparison of income and employment between domestic and overseas students

Census data in 2011 showed that:

• 86.6 per cent of domestic full-time students participated in paid jobs,
• 87.1 per cent of full-time students coming from English speaking countries worked in paid jobs,
• For full-time students coming from non-English speaking countries, the percentage having a paid job is 74.3 per cent.

Thus, the probability of undertaking paid work was similar between domestic full-time students and full-time students coming from English speaking countries, but was lower for full-time students coming from non-English speaking countries.

Table 5.12 represents the income of different groups of full-time students. The Table shows that students from English speaking countries earned higher income than domestic students and students from non-English speaking countries. In particular, 3 per cent of full-time students coming from English speaking countries earned more than 1,000 dollars per week, while this proportion for domestic full-time students and full-time students coming from non-English speaking countries are 1 and 2 per cent, respectively.

Table 5-12 Income of full-time student groups

<table>
<thead>
<tr>
<th>Full-time students</th>
<th>0-400 $/week (%)</th>
<th>400-1000 $/week (%)</th>
<th>More than 1000 $/week (%)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic students</td>
<td>90</td>
<td>9</td>
<td>1</td>
<td>10797</td>
</tr>
<tr>
<td>Students from English speaking countries</td>
<td>83</td>
<td>14</td>
<td>3</td>
<td>1117</td>
</tr>
<tr>
<td>Students from non-English speaking countries</td>
<td>81</td>
<td>17</td>
<td>2</td>
<td>3190</td>
</tr>
</tbody>
</table>
5.7 Overview

Overall, the main migrants’ characteristics found to affect productivity and employment positively included:

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Productivity</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being born in English Speaking countries</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Being born in OECD countries</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>English proficiency</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Having university education</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Highest qualification being Australian qualification</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Having overseas post school qualification</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Fields of study are in Health and Education</td>
<td>--</td>
<td>Yes</td>
</tr>
<tr>
<td>Being sponsored by an employer or a State</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Being a migrant on Skilled Independent visa</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Being a migrant on an onshore visa</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
5.9 **Key point summary**

- Based on panel data from HILDA, migrants with otherwise similar characteristics to non-migrants have been more productive; and migrants increased productivity more rapidly than non-migrants.
  - Migrants born in English speaking countries and migrants born in OECD countries were more productive, as measured by the hourly wage rate, than non-migrants, migrants born in non-English speaking countries and migrants born in non-OECD countries.
  - No significant difference in the probability of being employed was found between migrants and non-migrants.

- English-language proficiency and type of education are important explanatory factors in labour market performance.
  - English proficiency increased productivity as well as the probability of getting a job.
  - Having a university education increased productivity and the probability of having a job.
  - Highest qualification being Australian qualification did not affect productivity, but did increase the probability of being employed.
  - Having an overseas post school qualification did not increase the probability of getting a job, but did increase the migrant’s productivity.
  - Migrants whose fields of study had been health and education were more likely to be employed than migrants in other fields of study or migrants without tertiary education.

- The visa class of permanent migrants influences their productivity and employment outcomes.
  - Migrants on Employer or State sponsored and Skilled Independent visas had a higher hourly wage and had a higher likelihood of having a job compared to migrants on Family dependent visa.
  - The unemployment rate was lowest for migrants on Employer sponsored visa and highest for migrants on Family sponsored visa. Unemployment rates were similar between migrants on State sponsored visas and Skilled Independent visas.
  - Migrants with onshore visas earned more per hour and were more likely to have a job than migrants with offshore visas.

- Temporary migrants show the following productivity-related characteristics:
  - Migrants with 457 visas whose first language is English were more productive and more likely to have trained other workers at their company.
  - Temporary migrants on the WHM program earned significantly less per hour compared to non-migrants and permanent migrants.
  - Temporary WHM migrants with a university qualification and who are more fluent in English were less likely to do farm work.
  - A larger percentage of international students from English speaking countries earned a high income compared to domestic students and students coming from non-English speaking countries.
6 CONNECTEDNESS AND PRODUCTIVITY

6.1 Introduction
In this chapter we elaborate on two of the underlying determinants of productivity: social capital and international trade, as identified in Chapter 2. First, we discuss how social capital can influence economic outcomes using a schematic framework that analyses causality between migrants’ connectedness and productivity. Second, we explore the empirical evidences on the significance of migrants’ connectedness for international trade, investment, innovation and business performance in their host countries. Third, we briefly discuss how connectedness influences the economic outcomes for immigrant children in settler societies. The chapter concludes with a discussion on an exploratory framework for linking connectedness and wellbeing.

6.1.1 Economics of Social Capital: A Framework for Networks—Productivity Link
Social networks and trust are core ingredients of social capital. In this section, we analyse the causal link between social capital and economic advancement for a country with a significant immigrant population. Key researchers such as James Coleman and Robert Putnam, among others from a range of social science disciplines, have extensively analysed this causal link. “Social capital is defined by its function. It is not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures... Like other forms of capital, social capital is productive”, observed Coleman (1988, p 98). Robert Putnam defines social capital as “connections among individuals -social networks and the norms of reciprocity and the trustworthiness that arise from them” (2000, p 19).

In terms of migration and productivity, social capital is important as it can assist migrants to find employment and, possibly, secure employment that is better suited to their skills. For instance, employment opportunities that can be created through social connections were first theorised by Granovetter (1973). This has become known as ‘the strength of weak ties’ whereby people who are known through acquaintances, rather than in strong personal friendships, are important for finding work.

Local areas where migrants to a host country predominate, in terms of coming from a particular emigrant location or country, can provide social networks that assist in finding employment for migrants generally, as well as being a place for employment opportunities. For example, as the first point of entry for migrants, a newly arrived Chinese immigrant to Sydney with poor English language skills may find their employment prospects are enhanced by developing or building upon social networks within Chinatown.

Economic outcomes are influenced by networks, connections and trust. To illustrate, Figure 7.1 provides a conceptual framework based around the links between economic growth and technological change, human capital, research and development (R&D) and social capital. In comparison to the productivity framework in Chapter 2 (Figures 2.2 & 2.3) the distinctive element in this framework is the identification of the ways in which connectedness/networks can influence labour productivity.
Social capital can influence economic growth through multiple pathways. First is the role networks and trust have on international trade and investment through facilitating connections and contacts and reducing the communications and transactions costs. Second, networks can promote knowledge diffusion by linking people and groups with complementary skills and knowledge. In turn, this can promote adoption of innovations. We will analyse these two pathways in greater detail in the context of diverse societies with significant immigrant populations in section 6.3. Third, civic participation and norms of reciprocity can affect economic growth in an indirect manner (represented by a dotted arrow in Figure 6.1) through better performance of government institutions and the delivery of public goods and services. This is because trust reduces crime, litigation and other social conditions that arise from a lack of trust and that increase the costs of doing business. Fourth, social capital can influence, and be influenced by, human capital.
example, formal education typically includes informal training on socialisation skills and is positively related to civic engagement. Social capital embedded in relations with family and friends can also reduce the probability of dropping out of high school that, in turn, promotes investment in human capital.

In summary, both the structural aspect of social capital in the form of social networks and the interactions they engender matter. The cognitive aspect of social capital, as represented by trust among different social groups, can also assist the private sector and the public sector in the allocation of scarce resources. This, in turn, can foster greater levels of economic growth and prosperity.

6.2 Connectedness & Productivity: Causality & Empirical Evidence

6.2.1 Connectedness, Trade and Investment

The migration-trade link and connectedness are based on the economic significance of non-economic factors like cultural differences between trading partners. Cultural differences are defined as the degree to which shared norms and values differ from one country to another (Hofstede 2001 in Tadesse and White, 2007). In this perspective, the greater the cultural distance between the two countries, the greater will be the cost of trade. Higher costs can be attributed to two principal sources. First, barriers to communication can be created by differences in language, race, ethnicity, religion or culture. These barriers, in turn, restrict interactions across social groups that is important for the exchange of information (Grafton et al., 2007). Second, social barriers increase transaction costs for contract enforcement due to differences in institutional frameworks or perceptions about social and cultural norms (Tadesse and White, 2007).

As identified in Figure 6.1, connectedness of immigrants can help break down these barriers to reduce the cost of trade between their countries of origin and the host country, and consequently contribute to increasing bilateral trade. This connectedness across the social/cultural groups or bridging social capital can reduce the cost of interactions. Bridging social capital is defined as the degree to which two or more individuals from different social groups with dissimilar backgrounds ‘connect’. In sociology connections ‘across the groups’ relates to how different people are to each other, or the concept of ‘heterophily’. By contrast, homophily, whereby people who are similar are more likely to interact and bond together in social groups, is the basis for bonding social capital (Rogers, 1995).

Immigrants with strong bridging social capital influence the ‘trade creation’ effect for countries which are more culturally dissimilar from the host country in at least two ways. First, immigrants can provide ‘weak ties’ for a host country’s businesses because of their language skills and knowledge about social norms and nuanced cultural practices unique to country of origin. Two, where there are differences in law and property rights, and a largely different market structure, immigrants can support a host country’s business sector in terms of contract delivery (Dolman, 2008). This can be achieved by providing complementary informal institutional structures like higher trust and better knowledge of business practices. Although the literature on migration-investment link is scarce, we believe migrants can also play a role in increasing two-way investment flows. For example,

39 Connectedness and networks are used interchangeably in this chapter.
Australian businesses wanting to invest in Vietnam can benefit from existing networks of Vietnamese migrants.

### 6.2.2 Empirical Evidences

Tadesse and White (2007) evaluated the role of migrants in reducing the trade-inhibiting impact of cultural distance on exports across the US states with 75 trading partners. In order to assess cultural distance they focused on two dimensions of Culture: Traditional vs. Secular-Rational authority (TSR) and Survival vs. Self-Expression values (SSE). TSR measures the religious dimension of culture in terms of the differences between societies where religious beliefs dominate authority structures and societies, compared to societies where secular authority dominates and where freedom of speech and self-expression are promoted. SSE captures the economic and socio-political dimension of culture and measures the difference between societies that promote ‘liberal’ principles of individualism and free markets compared to societies where there is a major role by government in securing entitlement for vulnerable and minority members of society.

Applying a gravity model of trade whereby trade is inversely proportional to the geodesic distance between countries, Tadesse and White show that after controlling for the traditional explanatory variables\(^\text{40}\), a 1 per cent increase in the stock of immigrant population in a given US state will increase the export from that state to the immigrants’ countries of origin by 0.047 per cent. This effect of the immigrant stock remains positive under all specifications, but with varying degrees. The coefficient for cultural distance in their model is negative and statistically significant, which indicates that greater social differences reduces exports, but this effect for both cultural and non-cultural exports diminishes for states with larger immigrant populations.

Peri and Requena-Silvente (2010) used a gravity model for 50 Spanish Provinces and 77 international trading partners over 14 years. They find that an increase in the immigrant population from a particular country increases the number of trade transactions between the source and destination countries. Their results also show that the trade impact is higher for differentiated products, and for countries which are culturally distant. Their findings are robust even after addressing endogeneity for migrants’ selection of provinces.

Dolman (2008) analysed the impact of migration on trade and foreign direct investment (FDI) for 28 OECD countries and their 162 trade partners with various control variables. Apart from the expected positive impact of immigrant stock on bilateral trade flows and bilateral investment patterns, his results indicate that the impact of a larger migrant population is higher for trading partners with higher information barriers as a result of distance and differences in languages.

Business migrants can influence bilateral trade between a host country and country of origin. Based on an extensive review of case studies on historical trade diasporas like Hasua in West Africa and Maghrubi\(^\text{41}\) traders of the eleventh-century Mediterranean (Cohen 1969, Grief 1989 in Rauch 2001), and the empirical literature on recent transnational business networks, Rauch (2001) argues that

\(^{40}\) The set of control variables used in this study are: geodesic distance, gross state product per capita, gross domestic product of the countries of origin, openness, changes in exchange rate, dummy variables for status of Free Trade Agreement with the US, for English as medium of instruction and for a landlocked country.

\(^{41}\) The Maghrabis were a group that maintained a separate identity within the Jewish Diaspora of Islamic Mediterranean (Rauch 2001).
business networks contribute significantly to international trade. This arises from mitigation of the problems of contract enforcement, and informal barriers to trade like inadequacy of information about trading opportunities. Prominent examples of successful trade diasporas are: Chinese and Indian software engineers in Silicon valley (Saxenian 1999 in Rauch, 2001), Taiwanese entrepreneurs in the computer business in Hamburg (Kloosterman and Rath, 2001), Chinese businesses in Australia (Lever-Tracy and Ip, 2005), and Salvadoran entrepreneurs in the US (Portes et al., 2002).

Using the 1996 Census, (Collins, 2003) indicates that immigrant entrepreneurs in general concentrated in retail industry and some immigrant groups have higher rates of entrepreneurship than that of Australian-born, which was 7.6 per cent. The rate of entrepreneurship for Koreans, Greeks, Italians, Israelis, Cypriots and Lebanese immigrants are 12.5 per cent, 11.5 per cent, 11.2 per cent, 10.7 per cent, 10.3 per cent and 9.1 per cent respectively. Interestingly the immigrants from English speaking countries like England, Canada and New Zealand showed similar rate of entrepreneurship as the Australian-born. Based on a survey of 1,500 entrepreneurs in Sydney, Melbourne and Perth, the author also reports that ethnic minority entrepreneurs, particularly those born in Asia, had a higher rate of international trade than non-immigrant entrepreneurs (Collins 1998 cited in Collins 2003). In addition to the changes in the ethnic composition of immigrant population in Australia, the tremendous improvement in the ICT is likely to contribute to substantial changes in the patterns of ethnic entrepreneurship and the degree to which these entrepreneurs are trading with their countries of origin. Consequently there is a need for new surveys and analysis of data, to evaluate the contribution of immigrant entrepreneurs on export earnings of Australia.

6.2.3 Networked Diffusion and Innovation

Diffusion is essentially a social process. Rogers (1995) defines, ‘diffusion of innovations is the process by which an innovation is communicated through certain channels over time among the members of a social system’ (Rogers, 1995:5). A central premise of social network analysis is that individuals have relational ties to other individuals, where each individual may also be tied to another one or a web of social connections. Consequently, social interactions, such as working with colleagues or meeting in a social organisation like a club, frequently act as a means to exchange knowledge and information. Relational ties affect knowledge interactions because trust and norms of reciprocity built within social or community structures can encourage the sharing of knowledge and information. Given the uncertainty attached to new products or practices, the interpersonal exchanges contribute to validating the personal opinions and provide the basis for the concept of ‘networked diffusion’. Thus, networked diffusion emphasises the role of social networks for innovation diffusion. This was first analysed in a study on diffusion of hybrid corn in the US state of Iowa.

Knowledge diffusion is the basic premise for innovation. One of the principal advantages of a multicultural society originates from the complementarity in knowledge and skill sets among the economic agents who are diverse in terms of culture, race, language or ethnicity. Hunt and Gauthier-Loiselle (2010) and Hunt (2011) are two major studies that analyse the migration-innovation link using the US dataset. The 2010 study provides evidence that a 1 per cent increase in the number of educated immigrants contributes to innovation, as measured by the number of

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42 The productivity enhancing impact of diversity is analysed thoroughly in Urban Economics literature, pioneered by Richard Florida (2002) and Ottaviano and Peri (2005) among others.
patents per capita by 9-18 per cent. Their 2011 study examines the impact on innovation by visa category. They conclude that immigrants with a student visa or temporary work visa have a higher rate of patent creation than their non-migrant counterparts.

The productivity enhancement from the diffusion effect can be restricted where there are barriers to communication (Grafton et.al., 2007, Ratna et al., 2012). If this is correct, the social integration of immigrants with their host country, and specifically in terms of bridging social capital, may facilitate more knowledge exchanges among migrants and non-migrants. In turn, this can contribute to innovation-driven economic growth. In support of this view, and based on the number of patents per capita across different regions in Germany, Neibuhr(2010) provides evidence that the possible negative effects of diversity (defined by nationality) are outweighed by the positive effects of diversity. These arguments are explained in the following model.

6.2.4 An econometric model for connectedness–productivity link

A study by Ottaviano and Peri (2006) looks at the differences in average labour productivity, measured as hourly wage, across different US cities. The authors used a panel dataset from 1970 to 1990 and concluded that US-born white workers are more productive in cities that are more diverse. They argue that in the more linguistically diverse cities native workers are more productive as the positive impact of diversity (measured as Herfindahl index43) due to complementary skills and knowledge sets, outweighs the negative impact of diversity resulting from higher cost of communication. Using the same theoretical framework, similar results were found for 12 European countries: Austria, Belgium, Denmark, France, former West Germany, Ireland, Italy, The Netherlands, Portugal, Spain, Sweden and the United Kingdom. Neither of these studies include a proxy for connectedness, which is crucial for knowledge exchanges in a diverse setting. For example, in a culturally diverse city like San Francisco/Sydney the positive impact of diversity can lead to higher productivity only if the people are connected across the social groups. In other words labour productivity in diverse cities will be higher if the level of bridging social capital is higher.

This economically beneficial impact of connectedness is addressed by Ratna et al. (2012). Based on the theoretical framework in Grafton et.al. (2007), the authors argue that in the absence of a common language, highly diverse states or provinces are constrained by reduced social interactions among workers with different linguistic backgrounds. Using a cross-sectional dataset for the 48 contiguous states in the United States and 13 Provinces in Canada, the authors use percentage of population who are not fluent in English as a proxy for linguistic barriers. The estimated results indicate that the positive economic payoff of linguistic diversity is diminished with higher numbers of people who are less fluent in English.

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43 This index measures the likelihood that two people chosen at random from a diverse universe will belong to different social groups.
Based on the above discussion, labour productivity at the city level can be estimated by the following fixed effect model:

\[
\ln (\bar{w}_{c,t}) = \chi_c + \beta_1 + \delta_c (d_{c,t}) + \alpha_d (d_{d,t}) + \lambda (SC_{c,t}) + \gamma_b (b_{c,t}) + e_{c,t}
\]

The dependent variable \( w \) is the average wage/ labour productivity across cities and the traditional explanatory variables are: \( \chi_c \) are city fixed effects, \( c_{c,t} \) is a vector of control variables such as educational attainment, experience and a set of demographic controls. Three variables are added to capture the economic impact of connectedness in diverse setting. First, \( d_{c,t} \) is a vector for diversity indexes; second, \( b_{c,t} \) is a vector for barriers to communication, third, \( SC_{c,t} \) is a proxy for bridging social capital. It can be hypothesized that the estimated coefficients for diversity and bridging social capital will be positive, and the estimated coefficient for barriers to communication, which can also be interpreted as a proxy for lack of connectedness across social groups, will be negative.

### 6.2.5 Business Performance and Organizational Social Capital (OSC)

Although the common macro drivers such as technology and innovation or skill training assist in increasing business productivity, such drivers cannot be applied in the same way in all sectors. For example, the effectiveness of technological innovation is likely to be higher in firms engaged in mining or manufacturing than sectors such as tourism and hospitality. Consequently, increased trust and organisational capital in labour-intensive and service-oriented sectors may be more important for productivity than in sectors with very high levels of capital per worker.

The core dimensions of organisational social capital: trust, social relations, communication, commitment and influence, all shape the informal communication system of an organisation. This organisational effect lies outside the formal interactions between management and employees in terms of processes, controls, and standards. Both formal and informal communication systems influence the performance of an organization. Indeed, Requena (2003) argues that “...social capital is a better predictor of quality of life at work and job satisfaction than the characteristics of the worker, the company or organization, and the work environment.” Given that Australia has a highly diverse workforce from many different countries, the influence of organisational social capital is likely to be greater for Australia than for other nations. Service industries, such as tourism and hospitality, are particularly sensitive to organisational social capital. As a result, the effective use of seasonal employment that draws heavily on temporary migrants with working holiday visas is likely to be an important determinant of business success. Higher organizational social capital (i.e. higher trust and communication among employees) can encourage the working holiday makers to stay longer in the same job. Longer length of service can save the cost of training and skill development for the firms or business operations with high employee turnover, and thereby contribute to their enhanced economic performance.
6.3 Connectedness and Economic Assimilation of Immigrant Children

Educational attainment of immigrant children depends upon their parents’ human capital (both father and mother), their income level and ethnic origin. In addition, the literature on intergenerational mobility of education and income shows the importance of ethnic capital (Borjas, 1992), parents’ proficiency for mainstream language (van Ours and Veenman, 2003) and social capital (Aydemir et al., 2009) on migrant productivity.

Social factors are likely to matter more for immigrant children in segregated neighbourhoods or ethnic enclaves. Apart from lack of economic assimilation of their parents (Borjas, 2000), intergenerational mobility of immigrant children is also influenced by frequent social, cultural and economic intra-group contacts (Borjas, 1995) and in terms of bonding capital, and the choice of friends at school (Smith et al., 2014). It follows, therefore, that any measure of productivity differences between second-generation or third-generation immigrant children and their non-migrant counterparts requires an evaluation of the impact of residential segregation on economic outcomes.

6.4 Economics of wellbeing and connectedness

There is a tendency for policy makers and academics to see social issues and economic issues separately. Most sociology and demography literature focuses on social and cultural differences between migrants and non-migrants. The labour economics literature has typically focused on skill differences, labour market integration and productivity differences. In addition, there is a need to analyse the impact of social factors like connectedness on economic outcomes like productivity and innovation, which combines both these diverse strands of literature. As illustrated in Figure 6.2, informal institutions like social networks, trust and community engagement not only influence productivity and thereby economic/material wellbeing, but also matter for social, cultural and political wellbeing. Given the bi-directional link between material overall wellbeing and non-material wellbeing, it can be argued that wellbeing provides a more holistic view on societal progress and arguably can complement productivity as a guiding indicator for immigration policy.

**Figure 6-2 Connectedness-Wellbeing Link**
6.5 Key point summary

- Migrants with higher bridging social capital can facilitate bilateral trade by reducing costs of trade created through barriers to communication and cultural differences between the host countries and their countries of origin.

- The impact of migrants’ connectedness and knowledge about business practices is greater if the countries of origin are culturally very dissimilar and have weak formal institutions.

- Empirical evidence indicates that business migrants have successfully contributed to trade creation by facilitating transnational business networks.

- In multicultural/diverse societies, knowledge diffusion among migrants and native workers can contribute to innovation because of complementarity of knowledge bases, skill sets and experiences.

- Migrants’ connectedness also affects economic assimilation of their children because of ethnic capital and bonding social capital in the neighbourhood and schools, particularly if the migrant families are residing in segregated neighbourhoods.

- Migrants’ connectedness not only influences economic outcomes, but different aspects of social, cultural and political wellbeing of a society. Thus, wellbeing can complement productivity as a guiding indicator for immigration policy.
7 DATA GAP ANALYSIS

7.1 Introduction

This chapter discusses the limitations of current data in exploring the links between migration and productivity. We first review existing datasets and their weaknesses in measuring productivity differences between different migrants and native-born Australians. This analysis draws on the Data Review in Appendix A and Data Analysis in Appendix B. Next, we identify what further data will be useful in measuring determinants of productivity and the links between migration and productivity outlined in Chapter 2 and in Chapter 6. The chapter concludes with a discussion of the feasibility of addressing data gaps in the Australian context.

7.2 Limitations of existing datasets

The main DIBP surveys (CSAM and LSIA) include only permanent residents. Given the increasing significance of temporary migrants (as the largest group of migrants and the most common route to permanent residence), this limits the usefulness of the datasets in assessing labour market outcomes of migrants as they settle in Australia (Gregory, 2014). Of specific concern to this report is the restrictions imposed on measuring earnings and productivity of migrants as they move from temporary to permanent residence. The LSIA survey is also very old which detracts from its usefulness.

Other datasets that includes all migrants (such as HILDA and the Census) do not allow rigorous analysis by visa class and do not allow the separate identification of temporary and permanent migrants. HILDA collects some information on visa class, but the response rates are low and the sample sizes are small for recent migrants. The Census does not include visa categories. Of the other datasets we reviewed, which includes the Labour Force Survey and other ABS employment-related surveys (A.11.1), none contained information on both visa classes and incomes. Thus, they were not helpful in assessing the productivity of different types of migrants. See Appendix A for the full list of datasets we reviewed.

The main DIBP surveys (CSAM and LSIA) are panel data. Unfortunately, they allow only very limited analysis of how employment outcomes and productivity of permanent migrants change over time. This is because the available data from the first round of the CSAM survey contains data for two waves where the time difference is only 6 months. The data from Wave 2 of the second round of the CSAM is not yet available. When this becomes available, CSAM could be used to analyse productivity improvements of permanent migrants over a 1-year period. Data from the first and second LSIA allows change to be analysed over a longer time period, but the final wave of this data is now more than a decade old. In this report (Chapter 5) we used HILDA to assess productivity over time, but this does not allow detailed study of different visa classes that would be possible with CSAM.

The ACMID dataset (which combines the Census and the Settlement Database) does allow more detailed analysis of visa classes beyond the broad Skill, Family and Humanitarian categories. ACMID also includes data on the applicant status i.e. whether they are primary or secondary visa holders. ACMID is not longitudinal, and uses 2011 Census data only, making the analysis of productivity differences limited.
Drawing on the Data Review in Appendix A, we summarise below the limitations of existing datasets for considering the productivity of specific types of migrant. We look at permanent migrants (skilled, family and humanitarian) and temporary migrants (including skilled 457 visa holders, students and working holiday makers).

### 7.2.1 Skilled Migrants

One of the limitations of existing datasets for analysing skilled (permanent) migration is the lack of available data specifically on business migrants. This makes it difficult to assess the stand-alone value of business migration compared to other migrants (DIBP, 2015). Business migrants often come with more financial capital than other skilled migrants and are capable of making an economic contribution to Australia by playing a role in co-ethnic business networks and bilateral trade with their country of origin (as discussed in Chapter 6, section 6.3). This makes them an important group to study in relation to productivity. CSAM data does allow business migrants to be separately identified, but suffers from the generic problems identified above.

One of our interests has been to analyse the impact of education on migrant productivity. This is covered in the analysis in Chapter 5. CSAM has information on birth country, and has information on highest education acquired in Australia or overseas, but it does not specify in which country education was acquired. For example, a migrant who was born in Sri Lanka could have acquired her post-school qualification in United Kingdom. Her labour market outcome is likely to be different from that of another Sri Lankan who graduated in Sri Lanka. Census data also does not provide information on the country where the post-school qualification or high school qualification was achieved.

It has been possible to control for Australian degrees by using HILDA data and evaluate the productivity impact of the Australian education system (see Chapter 5, section 5.2.2). Our results indicate that migrants with Australian degrees (with greater familiarity with Australian markets and legal system etc.) have a better likelihood of employment in Australia. The analysis on productivity differences could be improved by controlling for highest educational attainment in English-speaking countries or in countries that have similar economic, social and political institutions as Australia. This requires more detailed information on countries where highest education was acquired for migrants with non-Australian degrees.

### 7.2.2 Family Migrants

In this report, the CSAM dataset has been used to evaluate the productivity of family migrants. Khoo et al (2013) use a range of data to explore the social and economic contribution of family migrants, including a specially designed Partners Survey that identified partners across all visa streams. Khoo et al use LSIA data (first and second survey) to help explore labour market performance. Acknowledging that the LSIA data is dated, the authors point out that this was the only existing longitudinal dataset which specifically identifies partners of principal migrants (secondary migrants).

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44 Rauch (2001: 1178) defines co-ethnic networks as ‘communities of individuals or businesses that share a demographic attribute such as ethnicity or religion’.
The CSAM dataset used for this report contains some data on secondary migrants, but could not be used to capture the time dimension of changes due to unavailability of Wave 2 of the second round of CSAM data (at this stage).

The questionnaire for the CSAM dataset could be extended to incorporate data on social networks, community involvement and frequency of interactions with family and friends within or across the social groups defined by their country of birth. This data will help to evaluate the economic impact of social networks discussed in Chapter 6. Longitudinal data on these aspects of social capital will be crucial for assessing the evolution of social integration and civic engagement of both the principal applicant and his/her partner.

### 7.2.3 Humanitarian Migrants

The Longitudinal Survey of Humanitarian Migrants (LSHM) will be a valuable source of data for evaluating the contribution of humanitarian migrants over time, when the data is available.

The current questionnaire does not include information on country of origin and religion, however, this data can be obtained from administrative systems. The discussion above on the need for other social variables is applicable to humanitarian migrants as well as other migrants. Given that a large number of humanitarian migrants later sponsor for family migration (Hugo, 2014), some information on their sponsorship pattern would also be helpful in considering longer-term impacts.

### 7.2.4 Temporary Migrants

There are increasing numbers of temporary/short-term migrants in Australia. Whilst still representing a small fraction of the overall labour force, the aggregate economic contribution by different categories of temporary migrants is likely to be significant, as most of them are entitled to work. However, contribution to productivity by each category of temporary migrants has not been evaluated to date, primarily due to lack of data.

In our data review we find that the 2012 survey of subclass 457 visas is the only source of data for temporary skilled migrants. This dataset is useful, but limited. It is a one-time survey producing cross-sectional data and the response rate from employees (3812 out of 15000) was low. In Chapter 5, one of the analyses we undertook using this survey looked at employees who have trained other workers as an indicator that they are contributing to the productivity of other workers. Unfortunately, the dataset does not contain information on workers receiving the training and, therefore, insights into the effectiveness of the knowledge transfer as analysed in section 6.3.3, are limited.

No current datasets have detailed information on the holders of student visas/international students. Although some estimation is provided in Chapter 5 using Census data, more information is needed to evaluate the economic contribution and productivity of international students. Many students who arrive on temporary visas become permanent residents. This is another example of data on migrants moving from temporary to permanent residence that is currently lacking.

As identified in the Chapter 6 (which covers innovation and knowledge diffusion), there is empirical evidence that shows foreign students play a significant role in the innovation process in the US and
Germany. Literature on the migration-innovation link is scarce in Australia and the role of connectedness in this relationship, to our knowledge, has not been analysed.

7.3 Additional data needs for measuring migration and productivity links

Our report has focused on some of the links between migration and productivity as described in the framework in Chapter 2. We now consider what additional data would be useful in further explaining the links between migration and productivity.

7.3.1 Business performance and micro datasets

This section discusses the value of Longitudinal Micro-level Datasets (LMDs) and Linked Employer-Employee Data (LEED) to capture the role of managerial capability, human capital formation, technology and regulation (see Bartelsman and Doms, 2000 and Syverson, 2011). The benefit of such datasets is that differences in firm-level productivity and differences in individual productivity between migrants and non-migrants (including their skill acquisition over time) can only be fully captured with longitudinal micro-level data.

One of the well-established LMDs is the Longitudinal Research Dataset (LRD), a panel dataset of US manufacturing plants developed by the US Bureau of Census. The LRD contains longitudinally linked plant level data from the Census and the Annual Surveys of Manufacturers. The LRD has been developed into a more comprehensive Longitudinal Business Dataset (LBD). (See https://www.census.gov/ces/dataproducts/datasets/lbd.html). The LBD covers more than 8.5 million businesses for the period of 1976-2012. The aim of the LBD is to provide detailed statistics on research and development and to support research related to productivity, profitability and research and development investment.

In Australia, the ABS runs the Business Longitudinal Database (BLD) which was the successor of the Business Longitudinal Survey in the mid-1990s. The ABS has extended the BLD and we understand proposes to release an information paper in 2015 about an Extended Analytical Business Longitudinal Database.

The distinctive feature of a LEED is that it captures information about individual workers and details concerning the firms in which people work. For example, New Zealand has a LEED which combines administrative data from the Department of Inland Revenue and business data from Statistics NZ’s Business Frame. Many countries now have some form of linked employer-employee data.

As we discussed in Chapter 3, the ability to explore the links between individual productivity and earnings is hampered in Australia by the absence of linked employer-employee datasets. We understand that the ABS is considering ways to implement a LEED.

If a LEED were to be created in Australia, in addition to economic variables, it would be prudent to include demographic and social attributes of individual employers and employees. As pointed out in previous sections, a better estimate of productivity differences between migrants and Australians across firms can only be possible by having information on country of birth, ethnicity, language
proficiency, place where the highest education and/or training is obtained, nature of sponsorship received and year of arrival.

7.3.2 Migration, Trade and Innovation

Very few studies, to date, have analysed migration-trade and migration-innovation links in the context of the Australian economy. Exceptions include analyses of business networks mentioned in Chapter 6 (section 6.3.2). Lung (2008) is the only study, to our knowledge, which has analysed the migration-trade link in a rigorous manner. Based on a country-specific gravity model the impact of immigration on bilateral trade between Australia and 11 East Asian countries: China, Hong Kong, Indonesia, Japan, Korea, Malaysia, The Philippines, Singapore, Taiwan, Thailand and Vietnam, has been analysed with a panel dataset for 38 years. Like the other studies analysing migration-trade link (Section 6.3.2), the author uses the number of immigrants as a proxy for immigrant effect on trade, and estimates that, in the long run, immigrant intake in Australia increases export to the immigrants’ countries of origin at a decreasing rate. This result implies that there might be an ‘optimal’ size of immigrant population in terms of export growth. The long run relationship between immigrant intake and import could not be established in the analysis.

Innovation is a key avenue for productivity improvement, but there is a gap in literature focusing on the migration-innovation link in Australia. Jensen (2013) draws on emerging international analysis to suggest a number of ways to improve the evidence base in Australia. These include the development of linked datasets, for example, using the Settlement Database matched to other administrative datasets containing information on innovation or entrepreneurial outcomes such as the Australian Securities and Investments Commission (ASIC) business registry on new company formation.

7.3.3 Connectedness and Productivity

Based on the schematic framework discussed in Chapter 6 (section 6.4), we now consider data that may help to quantify the causal links between connectedness and productivity. Social and cultural attributes of immigrants can influence the economic outcomes of migrants in the host country. The literature on the economics of immigration and diversity largely focuses on the impact of linguistic proficiency. This is one of the key determinants of labour market integration of migrants, as shown in Chapter 5. Other characteristics such as race, ethnicity, religion and ancestry may also influence the nature and extent to which migrants integrate into the host society and, consequently, the productivity differences with native-born Australians.

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45 Basic gravity model assumes that a country’s trade flows depends on size of economies of the two trading partners and their distance.
46 Lung (2008) hypothesizes that immigration has two opposing effects on trade and the net effect of immigration depends on their relative strength. One, factor price equalization due to labour mobility can reduce exports. Two, foreign market information from the immigrants can facilitate exports. When the number of immigrants increases from a certain country, the positive impact of foreign market information is likely to be relatively stronger than the labour effect. Hence, exports from the host country increases with the increase in the number of immigrants. After the immigrant intake reaches a certain threshold the net effect of immigration becomes negative. Hence, the author includes two explanatory variables, immigrant intake (M) and square of immigrant intake. The estimated coefficients are positive and negative respectively, and are statistically significant.
Among the DIBP datasets, ACMID, CSAM and the 457 Visa Survey have information on birthplace, but this does not capture the diverse interactions of migrants from the same country on the basis of religious or cultural/ethnic proximity. Given the interwoven layers of identities for migrants (and also for non-migrant Australians), it is not possible to assess the individual impact of each of the attributes. More information on these attributes would allow researchers to have a better measure for the determinants of connections/networks within and across social groups, and would allow for an evaluation of the economic impacts of social networks and trust.

7.4 Feasibility of developing Australian Datasets

In this section we discuss the potential challenges to developing new Australian datasets, as well as extension of existing datasets.

A high priority for this type of analysis is around developing a LEED by linking employee and employers’ data surveys across different government departments. It will require time and significant resources but the existence of LEEDs around the world indicates that these challenges are not insurmountable.

A comprehensive micro dataset can also facilitate better evaluation of connectedness-trade and connectedness-innovation links by combining data on social networks and trust provided by the General Social Survey. Given the dearth of literature on the migration-trade link and the migration-innovation link, better information on business migrants is needed. Obtaining data on migrants under the newly introduced Business Innovation and Investment Programme (BIIP) and Significant Investor Visa (SIV) will be crucial to assess the economic merits of promoting business migration in Australia for innovation and higher economic growth.

The problems identified with existing datasets can be more easily addressed. For example, to collect data on missing social variables (such as religion and ethnic background), additional questions could be added to existing datasets such as HILDA and CSAM.
7.5 **Key point summary**

- Limited data on temporary migration (and on migrants as they move from temporary to permanent residence) restricts the ability to analyse the contribution of temporary migrants who are entitled to work, and labour market outcomes and productivity as migrants settle in Australia.

- Longitudinal data by specific visa categories is limited.

- It is not possible to assess the distinct contribution of business migrants (from other skilled migrants) using current datasets.

- The Longitudinal Survey of Humanitarian Migrants will be a valuable source of data for evaluating economic and social contributions of humanitarian migrants over time, once the data is available.

- The ability to explore the links between individual productivity and earnings is hampered in Australia by the absence of linked employer-employee datasets. If a LEED is created in Australia, consideration should be given to inclusion of demographic and social variables like country of birth, ethnicity, language proficiency, place where the highest education and/or training is obtained, nature of sponsorship received and year of arrival.

- Data on social variables, including religion and ethnic background, is lacking and would provide useful data on social capital and connectedness and could be collected by extending the questionnaires of current datasets.
8 POLICIES AFFECTING MIGRANT PRODUCTIVITY

The terms of reference seek an overview of policies that affect the productivity of migrants compared to non-migrants in Australia.

As discussed in the Chapter 2, productivity is influenced by a range of immediate and underlying determinants and migration can interact to varying degrees with all of these determinants. Government policies and institutional settings can influence productivity determinants in a myriad of ways. Figure 2.4 in Chapter 2 depicts this policy and institutional environment.

In this chapter we focus on policies that affect the productivity of individual migrants compared to non-migrants. We cover the role of migration policy in determining the type of migrants (age, skills, education, country of origin) coming to Australia and the breadth of policies that might affect migrant productivity post-arrival in Australia. We also discuss the significance of the broader citizenship and multicultural policy environment. The settlement experience of migrants and the ‘welcome’ of Australia, as well as global competition for skills, in turn may influence the quality of the pool of migrants wanting to come to Australia.

This overview relates to policy and institutional settings in Australia. We did not evaluate international policies and law in other countries and how they might influence migrants’ options and behaviour. The paucity of data would, in any case, make this very challenging. The International Migration Law and Policy Analysis (IMPALA) database currently being developed by researchers in Australia, and in a number of other countries, would allow this type of international comparison. The IMPALA research team is currently gathering comparable data on immigration law and policy in over 25 countries of immigration between 1960 and 2010. For further information see http://www.impaladatabase.org/.

8.1 Types of policy

Chapter 3 shows how the productivity of individuals can be regarded as arising from a) the innate characteristics of the individual, b) the acquired characteristics of the individual, and c) the characteristics of production in the firms in which individuals work (the context of the work they do).

Migration selection policies can determine both the innate and acquired characteristics of people entering Australia. This includes some key productivity-determining attributes such as age, education level and English language proficiency. Acquired characteristics can also be shaped once in Australia by migrants’ access to education and training opportunities.

The productivity of individuals is affected by the characteristics of firms and industries in which they work. The labour productivity of the average worker will be higher in industries, such as mining, that have high capital intensity compared with retail or even manufacturing. Selection policies influence the industries in which migrants work (e.g. by prioritising particular occupational skills), and thereby affect migrant productivity.

As we have shown, skilled selection policies are increasingly ‘demand-driven’ which means they create a direct link between specific industries and firms and would-be migrants. This means that
successful migrants should be highly productive, as they are able to perform work that could not be undertaken as well as or at all by others.

Chapter 3 discusses the nature of wage gaps and shows that it can arise in two ways. First, wage gaps can arise because migrants are relegated to lower-paying jobs that do not take full advantage of their productivity-related characteristics and qualifications. Second, they could be employed in jobs that do take advantage of what they have to offer, but are paid less than equivalents from the non-migrant majority. We stress that a wage penalty or wage disadvantage does not necessarily indicate discrimination. A wage gap could reflect differences in productivity. For example, even though a migrant and non-migrant may be equivalent on a number of characteristics including educational attainment, they may differ on relevant work experience or language proficiency.

A wide range of policies, therefore, exist that may affect the productivity of migrants relative to native-born Australians. These include policies that influence:

- the type of migrant arriving in Australia
- the timing of migration
- how long migrants stay in Australia
- where migrants settle and the industries in which they work
- the settlement experience of migrants (and migrants’ access to settlement services and language training)
- whether migrants are able fully to use their overseas education/qualifications
- the discrimination of migrants, and
- the retention of productive migrants

Policies can have a positive or negative (or indeed no) impact on the productivity of migrants compared to non-migrants. The Productivity Commission’s 2006 inquiry examined whether there were any legislative and other policy impediments to Australia realising the full economic potential from migration. Their report (Productivity Commission, 2006) considered the issues from two perspectives. The first was measures to control the intake of migrants and included the composition and selection rules affecting migrants. The second was measures that aim to integrate migrants into the labour force, economic and society. We adopt the same approach in this chapter.

First is to explore policies that affect the productivity of migrants on entering Australia. The second is policies that affect productivity post-arrival in Australia.

We draw no conclusions about the weighting of different policies in relation to their impact on migrant productivity. Nevertheless, the policies and processes which control the intake of migrants are clearly of vital importance.

8.2 Selecting productive migrants

Australia has a wide range of migration policies that shape the composition of the migrant in-take. These policies have been transformed over time. Chapter 1 sets out some of the broad trends and Table 8.2 shows the significant Australian migration policy changes over the past 40 years.
Skilled selection policies determining the selection of migrants tend to favour migrants who are relatively young, more qualified and experienced, proficient in the English language and with skills that are sought by Australian employers.

### 8.2.1 Selection on the basis of skills

As Cully (2011) described, since the 1970s, Australia has been operating migration programmes that are selective on the basis of skills. For instance, Australia’s permanent Migration Programme has increasingly prioritised Skilled Migration over Family Migration. The Skilled Migration programme itself has evolved over time and resulted in migrants arriving with characteristics that affect their likelihood of being highly productive.

Skilled migration can be either permanent or temporary. The use of temporary skilled work visas (457 visas) has also increased significantly over time. Overall, the balance of skilled to non-skilled migrants has shifted markedly to the former. There is a close association between skills and productivity such that today Australia’s migrants are likely to be more productive on arrival in Australia than in the past.

The overall shift in favour of skilled migration, and the changes to eligibility criteria that have resulted in more migrants with higher qualifications and greater English Language proficiency, are both significant productivity-enhancing developments.

A number of studies have examined whether Australia’s skilled migration policies have been effective in increasing the skill-levels of migrants entering Australia (see for example Antecol et al., 2003 and also Cobb-Clark, 2000). These studies try to disentangle how much of the increase in migrants with, for example, higher educational attainment is attributable to selection policies (state-selection), and how much to an increase in the number of higher educated people wanting to migrate to Australia (self-selection.)

The analyses appear to show that migrants entering under skilled programmes do differ systematically from those entering under family reunification programmes, with the former having higher skills and better labour market performance once in Australia. Thus, Australia’s skilled migration selection processes do work in that they deliver superior employment outcomes than would accrue if would-be migrants were chosen at random (Cully, 2011.)

### 8.2.2 Supply and demand-driven migration policy

Australia’s skilled migration policies have been characterised as a ‘hybrid system’ (Papademetriou et al., 2008). This hybrid is a mix between ‘supply-driven’ and ‘demand-driven’ migration. Applications for skilled migration used to be selected purely on capabilities and attributes and permanent residence could be secured without an offer of employment. This is ‘supply-driven’ migration and applications are assessed using a government-administered points test. Policies have evolved and, since the 1990s, also encouraged ‘demand-driven’ migration.

Cully (2011) observed how this has occurred through two routes. Greater weight was given to skills demanded by employers in the points tests. Additionally, employers have been given the ability to select migrants themselves through employer sponsorship, for either temporary or permanent
residence. Temporary skilled migration is entirely demand-driven. The cumulative impact of this is that the numbers of skilled migrants coming through the demand-drive route, whether permanent or temporary, has increased dramatically over the last decade.

Skilled migrants to Australia now come through a two phase processing system. The first phase is an electronic expression of interest via SkillSelect. This online service helps the government manage its skilled migration programme and link it to employer-demand and state and territory government nominations. SkillSelect also allows migrants to indicate if they are willing to live and work in regional Australia.

In addition to the shift towards skilled migration and the policy reforms to match skilled immigration selection more closely with labour market needs, Collins (2008) identified the revamping of the business immigration programme as a significant development in government policy. The most recent example of this is the introduction of the new Business Innovation and Investment Programme.

**8.2.3 Regional and rural settlement policies**

Since the mid-1990s, government policies have sought to encourage migrants to settle away from the major cities. The federal government works with state, territory and local governments, and regional authorities to provide a range of regional migration programmes. These programmes aim to both support regional development and supply the skill needs of regional employers. These programmes are also driven by concerns over the impact of further migration into urban areas already congested and ‘over-populated’.

The State/Territory Nominated Independents (STNI) visa scheme established in 1997 aimed to help State and Territory Government and regional authorities attract more skilled and business migrants. Since this time a number of other visa programmes with similar aims have been introduced. These include the Regional Sponsorship Migration Scheme (RSMS), the Regional Established Businesses in Australia programme, Skills Designated Area Sponsored visa (SDAS) and, most recently, the Designated Area Migration Agreements.
Table 8-1 Selected changes to Australia’s migration policy

(Edited and updated from Productivity Commission (2010), Table 4.2, page 27 which details Selected changes to Australia’s immigration policy from 1973 - 2010.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>Trans-Tasman Travel Arrangement between Australia and New Zealand introduced</td>
</tr>
<tr>
<td>1975</td>
<td>Working Holiday Maker visa introduced</td>
</tr>
<tr>
<td>1977</td>
<td>First Humanitarian Programme commenced operation</td>
</tr>
<tr>
<td>1996</td>
<td>Temporary Business (long stay) 457 visas introduced</td>
</tr>
<tr>
<td>1999</td>
<td>Migration Occupations in Demand (MODL) introduced</td>
</tr>
<tr>
<td>2001</td>
<td>Australian-educated overseas students made eligible for permanent residence</td>
</tr>
<tr>
<td>2003</td>
<td>Increase in points awarded for Australian honours, masters and PhD degrees</td>
</tr>
<tr>
<td>2004</td>
<td>MODL expanded to include accountants and a number of trade occupations</td>
</tr>
<tr>
<td>2005</td>
<td>Trade Skills Training Visa introduced</td>
</tr>
<tr>
<td>2006</td>
<td>Increase in base level of English proficiency required</td>
</tr>
<tr>
<td>2008</td>
<td>‘Demand-driven’ model for permanent skilled migration introduced Introduction of Critical Skills List (CSL) for independent skilled visa applicants</td>
</tr>
<tr>
<td>2009</td>
<td>Changes to CSL to focus it on health, medical, engineering and IT professionals</td>
</tr>
<tr>
<td>2010</td>
<td>MODL revoked and a Skilled Occupation List introduced Certain occupations (catering and hairdressing) removed</td>
</tr>
<tr>
<td>2011</td>
<td>Enterprise Migration Agreements introduced Revised points test with greater focus on human capital</td>
</tr>
<tr>
<td>2012</td>
<td>SkillSelect expression of interest system for skilled migration introduced</td>
</tr>
<tr>
<td>2013</td>
<td>Business Innovation and Investment Programme introduced Significant Investor Visa introduced</td>
</tr>
<tr>
<td>2014</td>
<td>Designated Area Migration Agreements introduced</td>
</tr>
</tbody>
</table>

The 2006 Productivity Commission inquiry examined whether Australia’s tax system was creating barriers to attracting and retaining skilled migrants. They concluded that it was difficult to assess whether current rules and administration were causing problems, but noted the flow of skilled migrants to Australia did not seem to be slowing. The Productivity Commission did, however, suggest that changes to taxation aimed at reducing barriers and complexity for skilled migrants (both permanent and temporary) should be considered in the context of wider taxation reform (Productivity Commission, 2006).

Productivity-enhancing attributes (such as educational attainment, relevant skills and work experience) are not relevant to the granting of visas through the Family and Humanitarian streams. Nevertheless, the productivity of all migrants (and indeed their general social and economic experience) will be affected by a range of factors once in Australia.

### 8.3 Post–arrival in Australia

Once in Australia, all permanent residents have access to a wide range of government services that support their settlement experience and could enhance their labour market performance. These include education and training programmes and access to employment services. Most temporary residents do not enjoy the same opportunities - the support that new arrivals to Australia receive depends largely upon their residence status. All migrants (whether temporary or permanent) cannot
access social security payments and benefits until their two-year Newly Arrived Resident’s Waiting Period has ended.

As referred to in Chapter 1, New Zealand citizens can live and work in Australia under the Trans-Tasman Travel Arrangement. Since 2001, New Zealand citizens have to meet standard Family reunification or Skilled migration criteria to become permanent residents or citizens of Australia. There are some 600,000 New Zealand citizens living in Australia who do not meet those criteria and, therefore, cannot access services (e.g. labour market programmes) that might enhance their productivity.

8.3.1 Migrant-specific and settlement services

Overtime, a number of both Commonwealth and State government labour market programmes have existed aimed specifically at migrants. For example, in 2013, the Australian Government announced a new fund (the Migrant Communities Employment Fund (MCEF)), later discontinued, to help tackle unemployment amongst immigrant and refugee workers in Australia.

A range of settlement services exist that, since late 2013, have been administered by the Department of Social Services. These are principally designed for, and used by, migrants in the Family migration and Humanitarian stream compared to migrants entering Australia via the Skilled migration route. These include Humanitarian Settlement Services, the Settlement Grants Programme and Complex Care Support.

The Community Hubs Programme is designed to offer assistance to migrants in accessing government and community support services. Increasing productivity is not a stated objective of any of these programmes, but there could be said to be a productivity ‘spin-off’.

8.3.2 English-language training

It is clear from our analysis (and that of many others) that English language proficiency is a key factor in migrant labour market performance and migrant productivity. As discussed above, the ability to speak English is one of the selection criteria in skilled migration programmes.

Post-arrival in Australia, migrants can access the Adult Migrant English Programme (AMEP). This programme provides up to 510 hours of English language tuition to help migrants learn foundation English language and ‘settlement skills’, with the aim of helping migrants settle in Australian society and to seek and secure employment. AMEP is available in around 250 locations across Australia, including rural and regional areas, as well as the major cities. The Department of Education and Training now administers AMEP.

Children of migrants can access ‘English as a Second Language’ programmes across Australian states and territories.

8.3.3 Recognition of overseas skills and education

The extent to which migrants can use their skills and qualifications once in Australia is important in terms of their productivity. Under-utilisation of skills has a strong link to reduced productivity both in
the short-term and in the longer-term as skills are increasingly not used. Australia has a well-developed regime for assessing and recognising overseas skills and qualifications, and many tertiary colleges also offer bridging courses for overseas-educated students.

A number of bodies and policies exist to support the goal of effective skill recognition. For example, the Trades Recognition Australia (TRA) is a skills assessment service provider specialising in assessments for people with trade skills gained overseas, or in Australia, for the purpose of migration and skills recognition. Another example is the Assessment Subsidy for Overseas Trained Professionals (ASDOT) programme that seeks to help skilled overseas-trained professionals with the cost of assessments and exams that might be required to enable practice in Australia. ASDOT only covers certain approved professions—this includes doctors (general medical practitioners), nurses, dentists and architects.

Whether this assessment and recognition regime could be improved is beyond the scope of this report. The 2006 Productivity Commission inquiry put forward a number of recommendations in this regard. They also pointed to evidence of overseas qualifications being undervalued by Australian employers (even when migrants skills have been assessed and recognised as equivalent to Australian occupational skills) and to examples of active discrimination (Productivity Commission, 2006).

Addressing these latter concerns can be linked to a wider set of policies which concern how migrants experience life in Australia.

8.4 The citizenship and multicultural policy environment

The broader policy context is relevant to both how Australians accept migrants and cultural difference and how well migrants settle and are productive in Australia. This can influence both the desire of would-be migrants to come to Australia and, indeed, whether migrants choose to stay in Australia.

There can also be tensions between migrant and non-migrant communities; and immigrants can feel some isolation, prejudice and exclusion. These, in turn, could undermine productive engagement in work activities.

8.4.1 Tackling racial discrimination

Migrants benefit from racial discrimination protection that exists in Australia. The Racial Discrimination Act 1975 gives effect to Australia’s international human rights commitments. It aims to promote equality between people of different backgrounds and to protect people across Australia from unfair treatment on the basis of their race, colour, descent, or national or ethnic origin in different areas of public life. Subsequent legislation has strengthened Australia’s anti-discrimination laws.

Robust legislation is generally considered necessary, but not sufficient, in tackling discrimination. A wide range of other policies and programmes (including community empowerment, education and advocacy projects) exist at Commonwealth and state level which attempt to address racism.
8.4.2 Citizenship policy

Since Australian citizenship was created through the Nationality and Citizenship Act 1948, it has been amended over 30 times. (For an overview of how Australian citizenship policy and law has changed since federation, see Klapdor et al, 2009.) Many of these amendments made citizenship easier to acquire and reflected the desire of successive governments to encourage migrants to settle quickly in Australia.

In 2007, the citizenship legislation was amended to increase the residence requirements (from two to four years) and to introduce a citizenship test. The citizenship test requires applicants to demonstrate knowledge of Australia’s history, culture and values and an understanding of English. As Klapdor et al. (2009) set out, supporters of these changes argue that would-be citizens should demonstrate a capacity and a willingness to integrate, and that easy access to citizenship can devalue it and erode public confidence in our migration programme. Critics argue that the changes are counterproductive and that a more welcoming notion of citizenship and multiculturalism is better for both social cohesion and successful migrant settlement.

8.4.3 Multiculturalism policy

In a broad sense, multiculturalism simply describes the cultural and ethnic diversity of Australia. Multiculturalism policy is about governments recognising and managing the effects of that diversity. Since the 1970s, many governments have produced their own multicultural policy statements such as Hawke’s ‘National Policy for a Multicultural Australia’ and Howard’s ‘New National Policy for a Multicultural Australia.’ Governments have also introduced practical measures like the establishment of the Special Broadcasting Service by the Fraser government (Ozdowski, 2012).

There has been much debate over the merits of multiculturalism policy (see for example, Kymlicka, 2012, Ratna 2012) A number of countries in Western Europe (UK, Germany, France and the Netherlands) have recently retreated from multiculturalism and have re-focused on the integration of migrants. Some commentators have expressed similar concerns in Australia and acceptance of migrants is still an issue in some parts of the Australian population (DIBP, 2014).

Whilst the profile of multiculturalism policy in Australia has waxed and waned somewhat, it persists as an overarching policy agenda with a specific set of policy programmes and an advisory body—the Australian Multicultural Council.

The Department of Social Services (DSS) currently administers most of the multicultural affairs programmes that were administered by the former Department of Immigration and Citizenship. These include the Diversity and Social Cohesion Programme, the Multicultural Arts and Festival Grants and the Building Multicultural Communities Programme. In 2013-14, around 250 organisations received one-off funding under the Building Multicultural Communities Programme. The aim of this programme is to enhance social inclusion and bring individuals and families together through the creation of multicultural meeting places (DIBP, 2015.) The Department of Human Services also have Multicultural Service Officers, specialists who work across metropolitan, regional and rural Australia to help migrants and refugees connect to government services.
The government’s Multicultural Access and Equity Policy places obligations on all government departments and agencies “to provide equitable access to services regardless of the cultural or linguistic background of clients” (DSS website, 2015). All engagement and communication of government departments and agencies with multicultural communities is considered relevant, not just direct service delivery. Departments and agencies are required to report annually in their Annual Reports and biennially to DSS. DSS is responsible for tabling a biennial report to both houses of Parliament. An inquiry into the Access and Equity policy was undertaken in 2011-12, which identified a number of improvements that could be made.

Linked to multiculturalism policy is the concept of ‘productive diversity’ (Cope and Kalantzis, 1997) which relates to businesses realising the competitive advantages of diversity. In 1992, Productive Diversity was announced as a federal government initiative by the Keating government. Its aim was to harness diversity (cultural and linguistic) as a national economic resource. Since then, there has been limited promotion or adoption of Productive Diversity.

### 8.5 Current policy reviews and the two-step migration policy

A number of policies have recently been reviewed or are currently under review. These include:

- An inquiry into the Business Innovation and Investment Programme (BIIP) by the Joint Standing Committee on Migration. Since its introduction in July 2012, application rates for the programme’s three visa subclasses have been lower than they were under the BIIP predecessor, the Business Skills Programme.
- In October 2014, the government announced significant changes to the Significant Investor Visa aimed at enhancing its competitiveness. Changes are expected to be implemented later in 2015.
- In February 2014 the government announced an independent review of integrity in the subclass 457 visa programme. The panel published its report in September 2014 and, in March 2015, the government supported in principle all 22 recommendations. Implementation of some of the recommendations is already in progress, including the re-establishment of the Ministerial Advisory Council on Skilled Migration and changes to the English language requirement.
- In September 2014, the department commenced a review of the skilled migration and temporary activity visa programmes to identify the potential for deregulation and simplification. A new visa framework is planned to commence in July 2016.

These review and reform processes all have possible impacts on migrant productivity.

Finally, we briefly consider the two-step migration policy and its implications for migrant productivity. As set out by Gregory (2014), Australia’s permanent immigration process has evolved into a ‘two-step’ policy framework. The first step is for migrants to arrive in Australia under a temporary visa (either as a student or a skilled worker) and then to take the second step of seeking permanent residence independently or through employer sponsorship. This first step is uncapped (and the level determined by the behaviour of employers and educational institutions). The second step is capped by government through the Migration Programme.
Around one half of permanent visas are allocated onshore to temporary visa holders with employment rights (DIBP, 2015). Hugo (2006) has estimated that in Australia, in any one year, the stock of temporary migrants with work entitlements accounts for probably three or more times the labour market input of permanent residents.

Gregory (2014) points to current data limitations that inhibit understanding of the labour market implications of this new migration paradigm. Our data gap analysis (Chapter 7) shows that data is lacking on both temporary migrants, in general, and on the transition from temporary to permanent migration.

We conclude by noting that the implications of this two-step migration policy are an important consideration in the links between migration and productivity. It is already clear that the Australian Government is adjusting policy in recognition that a too easy pathway from temporary to permanent residence may not be leading to the best labour market outcomes. When foreign students were gaining permanent residence via accessing low quality courses, their labour market outcomes were lower than people selected for permanent residence offshore.

Policy changes over the last few years have significantly reduced the number of students who obtain permanent residence. Nevertheless, it is still the case that the two-step migration process is the main route to permanent residence in Australia and this is likely to continue to be the case. This suggests policy attention is needed on the transition from temporary to permanent residence, and how the productivity (and indeed overall wellbeing) of migrants can be enhanced.
8.6 **Key point summary**

- Policies that may affect migrant productivity are many and varied and include:
  - Migration policies that affect the type of migrants gaining entry to Australia
  - Policies that affect productivity post-arrival in Australia
  - The wider citizenship and multicultural policy environment

- Overall, Australia’s Migration Programme has increasingly favoured skilled migration over family migration. Migration selection programmes based on skills have existed since the 1970s and today favour migrants who are relatively young, more qualified and experienced, proficient in the English language and with skills sought by Australian employers. This is a consequence of:
  - Changes to the selection criteria over time which have increased education requirements and English language proficiency
  - Greater weight given to skills demanded by employers in the points test
  - Employers being given the ability to select migrants themselves through employer sponsorship, for either permanent or temporary residence

- Post-arrival in Australia, migrants’ productivity may be affected by:
  - Access to education and labour market programmes
  - Access to settlement services
  - Access to English-language programmes, such as the Adult Migrant English Programme
  - Policies that facilitate recognition of foreign qualifications

- The wider citizenship and multicultural policy environment can affect the settlement experience of migrants and their productive engagement in work.
9 CONCLUSION

In this report, we have sought to achieve further understanding of the links between migration and productivity in Australia. We developed a conceptual framework for examining the determinants of productivity and considered how migration influences these determinants. We then explored some of these links empirically. In this short final chapter, we draw some overall conclusions, discuss the limitations of our analysis and suggest some avenues for future research.

9.1 Overall conclusions

Our first conclusion is, perhaps unhelpfully, that the task at hand—examining the relationship between migration and productivity—is very challenging. The determinants of productivity are many, the way migration influences these determinants is highly complex and the data limited.

As we discuss in Chapter 2, and elsewhere, linking individual productivity as measured by wages and skills’ distribution to national productivity growth is far from straightforward. The relationship between migration and aggregate productivity cannot be defined or quantified with a high degree of certainty. More generally, the complexity of the economy inhibits analyses that attempt to isolate, and demonstrate the impact of, one of its components or drivers.

Nevertheless, our findings do show that migrants have been more productive (as measured by earnings) and have increased their productivity more rapidly than non-migrants (Chapter 5). While our empirical analysis does not reveal the contribution of migration over the long term, it does show that migration has played an important role in labour market flexibility by helping to meet increased requirements for skills (Chapter 4).

Our review of international literature also reveals the role migrants can play in reducing costs of trade and in promoting innovation (Chapter 6). By favouring migrants who are relatively young, more qualified and experienced, proficient in the English language and with skills sought by Australian employers, Australia’s migration policies seem to be selecting migrants with a greater likelihood of enhancing productivity (Chapter 8).

Overall, we think it is reasonable to claim that migration has had a (weakly) positive impact on aggregate productivity in Australia over the period studied. Having said this, the transformation in the Australian economy over the past two decades has dominated any productivity performance that may have occurred as a result of migration (Chapter 2).

However, if the counterfactual (an Australia without immigration or with a very different migration pattern) is considered, stronger conclusions might be drawn. How would the Australian economy be faring today without the large inflows in recent decades of migrants highly skilled in computing and information technology? What would our higher education system look like if the rapid influx of international students had not taken place? We cannot answer these questions, but they hint at the productivity effects of migration that cannot be captured in empirical analysis.
It is also important to re-state that this report focuses on migration and productivity, and we do not examine the wider economic (or social) impact of migration, such as its contribution to re-balancing the aging of Australia’s population or the contribution of migrants to the size of the economy.

9.2 Limitations

Our overall conclusions illustrate some of the wider limitations of our work and its terms of reference. Some more specific limitations, however, exist due the methods we have used and the data that is available to us.

The estimation in Chapter 5 uses wages as a proxy for productivity. The rationale for this (Chapter 3) starts from the observation that the productivity of individuals can only be defined in the context of the work they do. A worker’s productivity reflects the capital available to the firm and the surrounding organisational arrangements. This means, in practice, wages are the only practical measures of individuals’ labour productivity when comparing productivity measures across industry sectors or groups of individuals.

The empirical literature also suggests that relative wages reflect relative productivity to a large degree and, perhaps to a greater extent in Australia than other countries. Whilst we acknowledge that wages are merely a proxy of labour productivity, and far from a perfect measure, wage differences between migrants and non-migrants in Australia do appear to be, primarily, a result of measurable productivity differences. We feel confident, therefore, in inferring productivity contributions from estimation using wages.

The ABS quality-adjusted labour input (QALI) method has been used in this report (Chapter 4) to assess the contribution of migration, in a statistical accounting sense, to an increase in workforce skills and to productivity growth between 2006 and 2011. Our analysis using HILDA (in Chapter 5) only uses panel data for the three years 2011 to 2013. Our analyses do not examine the impact of migration over the long term.

As we discuss in Chapter 7, a number of data limitations are evident. Most significantly is the lack of longitudinal data that traces migrants across visa categories, including from temporary to permanent residence status. The development or a LEED (Linked Employer Employee Dataset) in Australia would greatly enhance researchers’ ability to analyse productivity. Data on social variables, including religion and ethnic background, is lacking and would provide useful data to analyse the social capital and connectedness of migrants.

9.3 Future research

There are many possible avenues for future research on migration and productivity (given the multitude of drivers and links, as discussed in Chapter 2). We conclude with a few suggestions.

To our knowledge, no study has analysed the impact of immigration on innovation in Australia. As discussed in Chapter 2, innovation is a major source of productivity improvement for firms. Future
work might evaluate the migration-innovation link. A particular focus could be on business migrants who bring a significant amount of entrepreneurial skill and financial capital to Australia and are likely candidates for business innovations.

Studies quantifying the impact of immigration on trade are scarce for Australia. The only existing econometric study by Lung (2008) excludes major trading partners like India, United Kingdom, New Zealand or United States. Future investigations not only need to have a broader sample with all major trading partners, but also have some evaluation of migrants’ contribution to trade in countries which are culturally distant to Australia. In this regard, one interesting investigation will be to explore if the connectedness of humanitarian migrants plays a role creating trade relations with their countries of origin.

Further useful work could be undertaken to investigate the role of migration in facilitating industry structural change. A study of inter-industry movements of migrants could help illuminate one form of mobility.

Finally, the QALI framework could be used to investigate the regional dimension further, at a State level, and also the impact recent migrants have had on skills formation, as opposed to all migrants. It is possible, for example, to get QALI data by State and by years in Australia. The constraints would relate to the number and fineness of the disaggregations that might bring confidentiality and reliability into play, but it remains an interesting avenue for further research.
Appendix A  DATA REVIEW

A.1 Overview

This data review has been undertaken as part of research on the linkages between migration, mobility and productivity in Australia. The research is being undertaken as part of an agreement between The Australian National University and the Commonwealth Department of Immigration and Border Protection.

There are numerous sources of data that could be used in examining linkages between migration, mobility and productivity. This data review has looked at several of these in detail:

• The Household, Income and Labour Dynamics in Australia (HILDA) Survey
• Australian Population and Housing Census data 2011
• Continuous survey of Australia’s Migrants (CSAM)
• 2012 survey of subclass 457 employers and employees
• Australia’s Working Holiday Maker Programme (WHM)
• Australian Census and Migrants Integrated Dataset, 2011 (ACMID)
• Longitudinal Survey of Immigrants to Australia (1,2 &3)
• The Longitudinal Survey of Humanitarian Migrants (LSHM)
• Characteristics of Recent Migrants Survey

A number of other data sets have been reviewed in relation to assessing the relationship between migrants and productivity:

• The Settlement database (DSS data set on permanent migrants)
• Household Expenditure Survey and Survey of Income and Housing 2009-10
• Income and housing 2011-12
• Labour force and mobility 2012
• Barriers and Incentives to Labour Force Participation, Retirement and Retirement Intentions, July 2010 to June 2011
• Education and Work, Australia, May 2011
• Employee Earnings and Hours, Australia, May 2012
• Family Characteristics, Australia , 2009-10
• Survey of education and training
• Multipurpose Household Survey 2008-09
• Labour Force and Other Characteristics of Recent Migrants Nov 2007
• Labour Force Survey and Employee Earnings, Benefits and Trade Union Membership 2010
• Labour Force Survey and Forms of Employment Survey
• Longitudinal Labour Force, Australia, 2008-10
• Programme for the International Assessment of Adult Competencies, Australia, 2011-12

In addition to the above individual level data, there is limited micro data for firms.

This data review is an interim product of this research project. Next steps underway include the production of a data gap analysis and suggestions for future data needs. These will be included in the final report of the project.
A.2 The Household, Income and Labour Dynamics in Australia (HILDA) Survey

A.2.1 Data

Framework: The Household, Income and Labour Dynamics in Australia (HILDA) Survey is a household-based panel study which began in 2001. It collects information about economic and subjective well-being, labour market dynamics and family dynamics. Interviews are conducted annually with all adult members of each household. The panel members are followed over time. Wave 1 survey was conducted in 2001 and wave 13 was conducted in 2013. As the HILDA Survey has a longitudinal design, most questions are repeated each year. Nevertheless, within each survey wave, scope exists for asking questions on topics that will not be covered every year.

Sample size: The HILDA Survey began with a large national probability sample of Australian households occupying private dwellings. All members of the households that provided at least one interview in wave 1 in 2001 formed the basis of the panel to be pursued in each subsequent wave. The sample has been gradually extended to include any new household members resulting from changes in the composition of the original households. From wave 9, new household members that arrived in Australia for the first time after 2001 were also added to the sample. Data for Wave 13 was released in 2014.

Of the 13,969 people interviewed in wave 1 (Main Sample), 8301 were re-interviewed in wave 13. The number interviewed in all thirteen waves is 6746. Of the 4009 people interviewed in wave 11 Top-Up Sample, 3,419 were re-interviewed in wave 13. The number interviewed in the Top-Up Sample in both waves 12 and 13 is 3356.

Main information in HILDA data includes: Birth place, Citizenship, Permanent resident: Yes/No, Visa groups, Highest education level, Country where highest education was acquired: overseas and Australia, Employment status, Hours worked, Income: exact amount, English proficiency.

A.2.2 Potential estimation using HILDA data

For the purpose of examining the differences in labour productivity and probability of being employed between migrants and non-migrants and assessing how these differences change over time we use the data collected from the last three waves for the years 2011, 2012 and 2013. The reason for this choice is that the panel data for those three years include data from the top up sample in wave 11 that give a reasonably large data set with richer information regarding immigrants.
HILDA data set can be used to:

1. Estimate wage equations
2. Examine factors that affect possibility of being employed
3. Assessing how wage and probability of being employed change over time

Controlling for:

- migrants and non-migrant status
- industry
- education separately by where acquired such as Australian or overseas
- employment type: employee/ owner manager
- English proficiency
- birthplace: born in English speaking and non-English speaking countries
- gender and age
- the advantages and disadvantages of living areas
- experiences
- health condition
- other standard controls

A.3 Australian Population and Housing Census data 2011

A.3.1 Data

Framework: The Australian Population and Housing Census 2011 provides information on how many people there are in each part of Australia, what they do and how they live. The data record the details of all people (including visitors) who spend the night in each dwelling on Census Night, Tuesday, 9 August 2011.

Sample and selection method: Data in the Census Sample Files represent 3 per cent samples of all dwelling, family and person records from the 2011 Census of Population and Housing. The sample data is a random sample of one private dwelling in every twenty from the Census, and the associated family and person records. For non-private dwellings the sampling is applied to persons present, where five persons in every hundred are selected and the associated dwelling records included on the file.

Main information in the data includes: Age, Sex, Location, Year of arrival in Australia, Australian citizenship: Yes/No, Birthplace of female parent: Australian born/overseas, Birthplace of male parent: Australian born/overseas, Birthplace of the person: Australia/ and a list of other countries, Employment type: employee/ owner manager, Employment status: full-time, part-time, Hours worked per week, Person’s weekly income before tax: Negative/Nil/ and 10 different deciles, Industry of employment: 9 different industries and others, Labour force status: employed/unemployed, Language spoken at home: English only/ and 6 other specific languages, and others specified, Highest Education, Number of children ever born, Does the person’s business employ people?: No/ Yes, 1-19/ Yes, 20 or more, Occupation skill level, Proficiency in spoken English: Very well/Well/ not well/not at all.
A.3.2 Data limitations regarding assessment of effects of migrants on Australian Productivity

The information on income in Census data was reported in different deciles; Census data has no information on visa classes and no information on where education was acquired. This prevents us from analysing the differences in productivity, defined as the hourly wage rate, between Australian-born and overseas-born workers, between different visa classes and between education acquired in Australia or overseas.

If data on visa classes, places where highest education acquired were available and income variable was reported as a continuous value, it would be possible to analyse the differences in productivity between Australian-born and overseas-born workers, between different visa classes and between education acquired in Australia or overseas. This data set could also be used to assess the effects of social-cultural diversity on Australian productivity.

A.3.3 Potential estimation using Census data

Given limitations in the data available in the Census, we do not use the data from the Australian Census of population and housing 2011 in our quantitative analysis of labour productivity. However, for the purpose of examining the differences between migrants and non-migrants, we assess the difference in probability of being employed between migrants and non-migrants:

Controlling for:

- migrants and non-migrant status
- English proficiency
- birthplace: born in English speaking and non-English speaking countries
- education level and fields of study
- gender and age

A.4 Continuous Survey of Australia’s Migrants (CSAM)

A.4.1 Data

Framework: The CSAM measures the labour market integration of recently arrived migrants in the Skilled and Family Visa Streams. Within the Skilled stream, there are three categories including Employer Sponsored, State Sponsored and Skilled Independent visas. Migrants taking part in the CSAM are surveyed on two occasions to capture changes in their labour market status. This provides insights into the migrant integration process. Similar to the Longitudinal Survey of Immigrants to Australia, the benefit of using a longitudinal approach in CSAM is that it provides a better picture of settlement progress than would be captured from a point-in-time survey.

Selection method and sample: The first CSAM survey was undertaken in late September 2009. This consisted of around 8000 Primary Applicants who were granted a visa within the previous six months.
Six months later in March 2010, the next survey was run. This encompassed two separate surveys of distinct cohorts:

1. A new survey of Primary Applicants who had either arrived, or were granted their visa within the previous six months
2. A follow-up survey of the same group of migrants who had been surveyed six months earlier in September 2009

This process of introducing new migrants and following up migrants surveyed earlier was then repeated every six months until September 2011.

The second round of the CSAM survey was run in October 2013 had a total of 8,756 migrants completed the survey. In the second round of the CSAM, the process of introducing new migrants and following up migrants surveyed earlier was then repeated every 12 months.

This data set contains data for main applicant and partner on:

- **Labour market outcomes**—including employment measures such as unemployment rates, participation rates and hours worked, and occupational outcomes such as the type of occupation and what industry people are working in, and their income.
- **Demographic and language characteristics**—including age, gender, languages spoken and spoken English proficiency, which state respondents lived in Australia, skill level, number of children
- **Migration characteristics**—including visa subclass, year of arrival and reasons for migration
- **Educational characteristics**—level and field of study for post-school qualifications (both Australian and overseas)
- **Other characteristics**—including providing care and assistance to family and others, and undertaking non-work related activities such as domestic work or further study.

### A.4.2 Potential estimation using CSAM data

The CSAM data set can be used to:

1. Estimate migrants’ income equation
2. Examine factors that affect migrants’ possibility of being employed

Controlling for:

- visa stream: Skilled/Family
- visa category: Sponsored/Independent visa
- gender and age, whether having children
- employment type: employee/ owner manager
- education separately by where acquired such as Australian or overseas qualification
- industry
- English proficiency
- birthplace: born in English speaking countries/Others
- skill level
- year arrived
- others
Note:

1. Currently, the data for Wave 1 of the second round of CSAM survey is available, but the data for Wave 2 of CSAM’s second round is not. Potentially, when Wave 2 data becomes available in late 2015, the data set that contains information for both Wave 1 and Wave 2 of CSAM data can be used to assess how migrants’ productivity and employment status change over a 1 year period.

2. In this report, we use data collected from the Household, Income and Labour Dynamics in Australia (HILDA) Survey to assess how migrants’ productivity and employment status change over time. The available data from the first round of CSAM survey contain data for two waves, but the time difference is only 6 months which would not make a significant change in migrants’ productivity and employment status compared to changes over a period of 3 years in HILDA data.

A.5 2012 survey of subclass 457 employers and employees

A.5.1 Data

Framework: The subclass 457 visa is a temporary work (skilled) employer sponsored visa. It allows businesses to access international labour markets for skills and technical expertise that might not otherwise be available in Australia.

The survey was conducted in May and June of 2012 and included three cohorts:

Employees—primary visa holders who were in Australia on a 457 visa on 5 May 2012 and who had received their visa between 1 October 2009 and 30 June 2011.

Current employers—who at the time of the survey were sponsoring an overseas worker on a 457 visa issued between 1 October 2009 and 30 June 2011.

Lapsed Employers—who had previously sponsored an overseas worker on a 457 visa, but at the time of the survey had not sponsored since 1 October 2009 (over two-and-a-half years).

Data collection method and sample size: The 2012 457 survey of employees was conducted in June 2012 as an online survey, sent to 15 000 457 primary visa holders. At the conclusion of the survey, 3812 valid responses had been received.

The survey of current and lapsed employers commenced in late May 2012, using Computer Assisted Telephone Interviewing, with 1500 and 100 responses respectively.

Main information in the 457 Visa survey data includes: Location: state living in Australia, Employment status, usual working hours, if the employee trains other workers at their companies, month/year arrived in Australia, English proficiency, nationality, gender and age, time the visa holder been in Australia, income, other data regarding satisfaction with work and life.
A.5.2 Potential analyses using 457 Visa survey:

(1) Estimate 457 Visa holder’s income equation:

(2) Estimate the probability that the 457 visa holders train other workers at their companies

Controlling for:

- gender and age
- English proficiency
- nationality: English speaking/non English speaking country
- time the visa holder has been in Australia
- others

A.6 Australia’s Working Holiday Maker Programme (WHM)

A.6.1 Data

**Framework:** Australia’s Working Holiday Maker (WHM) programme, which commenced in 1975, is a temporary migration mechanism to allow young people from nominated nations to travel, work and study in Australia. The WHM programme includes two visa subclasses (417 and 462). The subclass 417 stream allows people aged 18-30 years from 19 nations under arrangements to experience Australian culture and lifestyle through an extended holiday and incidental employment, with a special focus on regional Australia. The 19 nations with whom such an arrangement is in place are Belgium, Canada, the Republic of Cyprus, Denmark, Estonia, Finland, France, Germany, Hong Kong, the Republic of Ireland, Italy, Japan, the Republic of Korea, Malta, the Netherlands, Norway, Sweden, Taiwan, and the United Kingdom (UK). The subclass 462 stream allows tertiary educated persons aged 18-30 years with functional English from five other countries to holiday in Australia and supplement their travel funds through short-term employment. These five countries are: Chile, Thailand, Turkey, the United States (US), and Malaysia. The Malaysian arrangement commenced on 1 February 2009, and thus is not included in the WHM 2008 survey.

**Data collection method and sample size:** The WHM 2008 survey included 20,444 WHMs during the period late August to mid-October 2008. The sample accounted for 14.8 per cent of the total WHM arrivals in 2007-08. The surveyed population was all WHMs who came to Australia on a 417 or 462 visa and departed Australia between January 2007 and August 2008. The WHM Survey was conducted via the Internet, only persons who completed their visa application online (around 99 per cent of 417 and 462 visa holders) and who provided a valid email address were included.

**Main information in the WHM data includes:** Migrants’ demographics (English proficiency, gender, age, citizenship, education), location of living in Australia, job in Australia, whether working in a farm, hours worked, income, expenditure.
A.6.2 Potential estimation using WHM data

Data from WHM programme survey can be used to track which industries attract the most temporary migrants. The survey can also be used to compare the average income of temporary migrants between different industries and to assess the probability of taking farm work after controlling for gender, age, English proficiency, education, reason for visiting Australia and whether having visited Australia before.

A.7 Australian Census and Migrants Integrated Dataset, 2011 (ACMID)

A.7.1 Data

Framework: The Australian Census and Migrants Integrated Dataset (ACMID), 2011 was produced using the following data sources:

1. 2011 Census of Population and Housing
2. Settlement Data Base which is an administrative database combining data regarding permanent settlers in Australia from various data sources within DIBP

Data: The ACMID, 2011 contains information on persons who responded to the 9 August 2011 Census of Population and Housing AND persons who had a permanent visa record on the Department of Immigration and Border Protection’s Settlement Database with a date of arrival between 1 January 2000 and 9 August 2011.

Sample size: ACMID data contains information for migrants only and the sample data is for 974,545 persons.

Main information in the ACMID data includes: Age, Sex, Australian citizenship: Yes/No, Applicant Status: primary applicant/secondary applicant, Visa classes, Birthplace of female parent: Australian born/overseas, Birthplace of male parent: Australian born/overseas, Birthplace of the person: Australia/ and a list of other countries, Employment type: employee/ owner manager, Full-time, part-time employment status, Hours work per week, Person’s weekly income before tax: Negative/Nil/ and 10 different levels, Industry of employment: 9 different industries and others, Labour force status: employed/unemployed, Language spoken at home: English only/ and 6 other specific languages, and others specified, Highest Education, Number of children ever born, Does the person’s business employ people?: No/ Yes, 1-19/ Yes, 20 or more, Occupation skill level, Proficiency in spoken English: Very well/Well/ not well/not at all.

A.7.2 Data issues regarding assessment of effects of migrants on Australian Productivity
Currently, access to ACMID data set is available through ABS website and data is available at aggregated level for regions including 123 regions. For reasons of confidentiality, currently ACMID data from ABS is not available at individual level.

In ACMID data, information on income was extracted from the 2011 Census data, thus income was reported in different deciles. Thus the data does not allow us to analyse the differences in productivity, measured as hourly wage rate, between different visa classes of migrants.

If data on income was reported in continuous value, this data set could be used to examine the differences in productivity between different visa classes of migrants.

Access to ACMID data is currently only available from the ABS’s DataAnalyser Beta Evaluation which is in the evaluation period for the release of the system. Given information on income was reported in only 10 different deciles, a method of choosing midpoints for income or interpolation would not be suitable. As such with ACMID data, in our analysis, we would analyse the differences in three income groups (low, middle, high) and in probability of being unemployed between different visa classes of migrants.

A.8 Longitudinal Survey of Immigrants to Australia

A.8.1 Data

Framework: The LSIA is the Longitudinal Survey of Immigrants to Australia and is the most comprehensive survey of immigrants ever to be undertaken in Australia. Longitudinal surveys collect data from the same individuals at different times over an extended period. To do so, individuals are surveyed on a number of different occasions. The benefit of using a longitudinal approach is that it provides a better picture of settlement progress than would be captured from a point-in-time survey.

The Longitudinal Survey of Immigrants to Australia provides data on the outcomes of three groups of migrants, those who:

- arrived in Australia between September 1993 and August 1995 (LSIA 1)
- arrived in Australia between September 1999 and August 2000 (LSIA 2)
- either arrived in Australia, or were granted a permanent visa in Australia between December 2004 and March 2005 (LSIA3)

As data from LSIA 1 and LSIA 2 are out-dated, they are not suitable for the current research. Data from LSIA 3 in 2005 could be used, however, with the availability of a recent longitudinal data from HILDA survey, we use HILDA in our analysis.

Collection method and sample size: The LSIA 3 is a survey of Primary Applicants from the Family and Skill stream and comprises two survey waves. Wave 1 of the survey was run in August 2005 using mail-back survey. Migrants were then surveyed again 12 months later in August 2006 (wave 2) using phone interview.
LSIA 3 surveyed approximately **9800** Primary Applicants in wave 1 who were granted their visa between December 2004 and March 2005.

LSIA 3 surveyed **5183** Primary Applicants in wave 2. There are fewer records as in Wave 2 LSIA only surveyed approximately half of the family stream migrants in wave 2.

**Main information in LSIA 3 data includes:** Number of Children, Location, Housing agreements: Own home/renting home, Highest qualification, Where highest qualification was acquired: Australia/Overseas, Year highest qualification was received, Which language speak best: English/others, English proficiency: very well/well/not well/ not at all, Whether being unemployed in the last 6 months, Current employment status: employed/unemployed, How often highest qualification was used in the job: Often/sometime, Number of hours worked a week, Gross annual income, Partner’s employment status: employed/unemployed, Partner’s gross income, Whether working in preferred occupation: Yes/No.

**A.8.2 Potential analysis using LSIA 3**

The data from LSIA can be used to:

1. Estimate income equation for migrants
2. Estimate equation of probability of unemployment of migrants
   - Controlling for:
     • number of children
     • location
     • highest qualification taking into account where qualification was acquired
     • year highest qualification was received
     • English proficiency
     • how often highest qualification was used in the job: Often/sometime
     • whether working in preferred occupation
   - Assessing how migrants’ probability of unemployment changes over a 1 year period

**A.9 Longitudinal Survey of Humanitarian Migrants (LSHM)**

**Framework:** Close to **2400** individuals and families who had been granted a permanent humanitarian visa in the previous 3 to 6 months and were living in communities around Australia were recruited to the study. The majority were living in Melbourne and Sydney, but others came from 11 sites in every state and territory, including smaller centres, as well as rural and remote areas.

These humanitarian migrants have diverse backgrounds and experiences, coming from 35 different countries and varied cultural backgrounds. Close to 50 different languages are spoken in their homes. Their age ranged from 15 to 83 years. Almost all had arrived in Australia in 2013 to start a new life and they had experienced trauma and persecution before their arrival.

**Data collection:** The study design is for information to be collected annually from 2013 to 2018 via alternating waves of home visits in Waves 1, 3 and 5 and telephone interviews in Waves 2 and 4. The
first wave of data collection ran from October 2013 to March 2014 and the second wave ran from October 2014 to March 2015.

**Topic covered:** Participants are asked questions covering a range of key domains, including demographic information, housing, language proficiency, education, employment and income, pre-migration experiences, health, self-sufficiency, community support, life satisfaction and life in Australia.

**Potential analysis using LSHM:** identify factors that help for the successful settlement of humanitarian migrants

**Data availability:** Data for LSHM is currently not available. It is expected that the data will be available in 2015.

### A.10 Characteristics of Recent Migrants Survey 2010 and 2013

#### A.10.1 Data

**Framework:** The Characteristics of Recent Migrants Survey (CRMS) provides detailed data about migrants who have come to Australia over the past 10 years and how they have fared after their arrival. Of particular interest is how migrants settle into employment.

**Topic covered:** Participants are asked questions covering a range of key domains, including demographic information, birth country and language proficiency, education, employment, visa category.

**Potential analysis using CRMS:** assess the migrants’ probability of being employed relating to their visa type, education, language skills or other characteristics.

**Data limitation:**

1. Information on income at individual level is not available in the CRMS (information on income is only available at household level). This prevents us from analysing the differences in productivity, defined as the hourly wage rate, between different visa classes.
2. Currently, for reasons of confidentiality, the micro data for CRMS 2013 is not available.

### A.11 Other data sets

#### A.11.1 Data for individuals
In addition to the data sets above, we have reviewed the following data sets in relation to assessing the relationship between migrants and productivity:

1. The Settlement database (DSS data set on permanent migrants)
2. Household Expenditure Survey and Survey of Income and Housing 2009-10
3. Income and housing 2011-12
4. Labour force and mobility 2012
6. Education and Work, Australia, May 2011
7. Employee Earnings and Hours, Australia, May 2012
8. Family Characteristics, Australia, 2009-10
9. Survey of education and training
10. Multipurpose Household Survey 2008-09
12. Labour Force Survey and Employee Earnings, Benefits and Trade Union Membership 2010
14. Longitudinal Labour Force, Australia, 2008-10
15. Programme for the International Assessment of Adult Competencies, Australia, 2011-12

None of those data sets contain information on both visa classes and income so they are not helpful in assessing the relationship between migrants and productivity. Some of those data sets contain information on both visa classes and labour force status, such as the data from Labour Force and Other Characteristics of Recent Migrants Nov 2007.

A.11.2 Data for firms

Micro data for firms are limited. A business longitudinal database for the period 1994-98 is available from ABS. However, this data set is outdated so we will not use this data set in our empirical analysis. For reasons of confidentiality, the Business longitudinal database for the period 2006-11 is currently not available.

The Business longitudinal database for the period 2006-11 contains information on Skills shortage or deficiency in undertaking core business activities such as engineering, scientific and research, and IT, for firms and data on total sales. Potentially, when this data set becomes available, it can be used to assess the relationship between firms’ performance and firms’ skills shortage; that infers the role of migrants in filling firms’ shortage of skilled workers.
Appendix B  DETAILS OF DATA ANALYSES

B.1 The Household, Income and Labour Dynamics in Australia (HILDA) Survey

B.1.1 Data

Framework: The Household, Income and Labour Dynamics in Australia (HILDA) Survey is a household-based panel study which began in 2001. It collects information about economic and subjective well-being, labour market dynamics and family dynamics. Interviews are conducted annually with all adult members of each household. The panel members are followed over time. Wave 1 survey was conducted in 2001 and wave 13 was conducted in 2013. As the HILDA Survey has a longitudinal design, most questions are repeated each year. Nevertheless, within each survey wave, scope exists for asking questions on topics that will not be covered every year.

Sample size: The HILDA Survey began with a large national probability sample of Australian households occupying private dwellings. All members of the households that provided at least one interview in wave 1 in 2001 formed the basis of the panel to be pursued in each subsequent wave. The sample has been gradually extended to include any new household members resulting from changes in the composition of the original households. From wave 9, new household members that arrived in Australia for the first time after 2001 were also added to the sample. Data for Wave 13 was released in 2014.

Of the 13,969 people interviewed in wave 1 (Main Sample), 8301 were re-interviewed in wave 13. The number interviewed in all thirteen waves is 6,746. Of the 4,009 people interviewed in wave 11 Top-Up Sample, 3,419 were re-interviewed in wave 13. The number interviewed in the Top-Up Sample in both waves 12 and 13 is 3,356.

Main information in HILDA data includes: Birth place, Citizenship, Permanent resident: Yes/No, Visa groups, Highest education level, Country where highest education was acquired: overseas and Australia, Employment status, Hours worked, Income: exact amount, English proficiency.

B.1.2 Potential estimation using HILDA data

For the purpose of examining the differences in labour productivity and probability of being employed between migrants and non-migrants and assessing how these differences change over time we use the data collected from the last three waves for the years 2011, 2012 and 2013. The reason for this choice is that the panel data for those three years include data from all of the top-up samples prior to 12 that give a reasonably large data set with richer information regarding immigrants.
HILDA data set can be used to:

1. Estimate wage equations
2. Examine factors that affect possibility of being employed
3. Assessing how wage and probability of being employed change over time

Controlling for:

- migrant and non-migrant status
- industry
- education separately by where acquired: Australian or overseas
- employment type: employee/ owner manager
- English proficiency
- birthplace: born in English speaking and non-English speaking countries
- gender and age
- the advantages and disadvantages of living areas
- experiences
- health condition
- other standard controls

**B.1.3 Empirical estimation results**

The analysis is grouped into two categories. In the first category, we regress the hourly wage rate of each respondent in dollars per hour against a range of respondent’s demographic characteristics. In the second category, we undertake probit estimation to estimate the probability of having been employed against various respondent characteristics. Combined, the two types of estimation seek to answer the following questions:

1. How are migrants’ productivity, measured as hourly wage rate, and migrants’ probability of being employed different from non-migrants’ productivity and non-migrants’ probability of being employed?
2. How do the differences between migrants and non-migrants’ productivity and probability of being employed change over time?
3. How do productivity and probability of being employed vary with different levels of education and with Australian qualification or overseas qualification?
4. How do productivity and probability of being employed vary with different levels of English proficiency?
5. How are productivity and probability of being employed different between being born in English speaking and non-English speaking countries?
6. How are productivities different between being born in OECD and non-OECD countries?
7. How does productivity vary between different employment types such as being an employee or being the owner of a business?
8. How is productivity different between different industries?
9. How does productivity change with years of experience?
The model suffers from heteroskedasticity in the error terms. Thus, we estimated models using Heteroskedasticity-Consistent Standard Errors (HCE) and used HCE when testing for the statistical significance of variables included in the models.

**B.1.4 Factors affecting hourly wage: Panel data 2011–13 and cross-sectional data 2013**

Using a balanced panel data set for three years 2011, 2012 and 2013 and a cross-sectional data set for year 2013, we estimated a model of hourly wage rate against respondents’ demographic characteristics including: migrant and non-migrant status; country of birth (being born in English-speaking/non-English speaking countries, or being born in OECD/non-OECD countries); English proficiency (English is the only language spoken, speak English very well, and others); gender (male, female); age of the respondent; employment type (being an employee or business owner); education (whether having a post graduate degree, whether having a bachelor degree, whether highest post school qualification is Australian or overseas qualification); years working for current employer; industry of employment; index measuring the advantages and disadvantages of living area; whether living in major urban areas; whether supervising others at work, whether having health problems, whether having internet at home.

In our analysis, we choose to use a balanced panel to investigate the improvement of productivity and employment of the same groups of respondents over time. Panel data is estimated with Generalized Least Squares (GLS) random effect model using Heteroskedasticity-Consistent Standard Errors. Cross-sectional data is also estimated using HCE to test for the statistical significance of variables included in the models. The reasons we used both the panel data for three years 2011-13, and the cross-sectional data for a single year 2013, are: first, the panel data only include respondents that provided responses to the surveys in all the three years, while the cross-sectional data also include new persons from the top-up sample in 2013 who only provided responses to the 2013 survey. Thus, the cross-sectional data covers a larger range of respondents. Second, given the complex design of survey data where the sample weight of each observation should be used and the stratification and cluster should be controlled for in the estimation, the regression with cross-sectional data can deal with all of these survey design characteristics, whilst GLS random effect estimation cannot control for probability weight (p-weight) which is the weight that observations were selected into the sample. Thus, we estimated models using both panel data and cross-sectional data as a way to check for the robustness of the results. Regression results are reported in Table B.1.
### Table B-1 Factors affecting hourly wage rate

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regression 1</td>
</tr>
<tr>
<td></td>
<td>(panel data 2011-13)</td>
</tr>
<tr>
<td><strong>Migrant and non-migrant status:</strong></td>
<td></td>
</tr>
<tr>
<td>Non-migrant year 2011 <em>(base category)</em></td>
<td>---</td>
</tr>
<tr>
<td>Non-migrant year 2012</td>
<td>1.19***</td>
</tr>
<tr>
<td>Non-migrant year 2013</td>
<td>1.81***</td>
</tr>
<tr>
<td>Migrant year 2011</td>
<td>3.11**</td>
</tr>
<tr>
<td>Migrant year 2012</td>
<td>4.84***</td>
</tr>
<tr>
<td>Migrant year 2013</td>
<td>6.84***</td>
</tr>
<tr>
<td>Migrant born in non-English speaking countries <em>(base)</em></td>
<td>---</td>
</tr>
<tr>
<td>Migrant born in English speaking countries</td>
<td>8.17**</td>
</tr>
<tr>
<td>Non-migrant</td>
<td>-0.05</td>
</tr>
<tr>
<td>Migrant born in non-OECD countries <em>(base)</em></td>
<td>---</td>
</tr>
<tr>
<td>Migrant born in OECD countries</td>
<td>6.77**</td>
</tr>
<tr>
<td>Non-migrant</td>
<td>-0.53</td>
</tr>
<tr>
<td><strong>Birth country:</strong></td>
<td></td>
</tr>
<tr>
<td>Being born in English speaking countries <em>(base)</em></td>
<td>---</td>
</tr>
<tr>
<td>Being born in non-English speaking countries</td>
<td>-3.47**</td>
</tr>
<tr>
<td><strong>Education characteristics:</strong></td>
<td></td>
</tr>
<tr>
<td>Having a post graduate degree</td>
<td>12.16***</td>
</tr>
<tr>
<td>Having bachelor degree</td>
<td>8.15***</td>
</tr>
<tr>
<td>Highest qualification is Australian qualification</td>
<td>2.46</td>
</tr>
<tr>
<td><strong>English proficiency</strong></td>
<td></td>
</tr>
<tr>
<td>Not speaking English very well <em>(base)</em></td>
<td>---</td>
</tr>
<tr>
<td>Speak English very well</td>
<td>5.26***</td>
</tr>
<tr>
<td>English is the only language spoken</td>
<td>5.99***</td>
</tr>
<tr>
<td><strong>Industry groups:</strong></td>
<td></td>
</tr>
<tr>
<td><em>Industry</em> <em>(base industry:)</em> Public Administration, Education and Training, and Health Care and Social Assistance)*</td>
<td>---</td>
</tr>
<tr>
<td>Agriculture, Forestry and Fishing</td>
<td>-6.23***</td>
</tr>
<tr>
<td>Mining</td>
<td>11.81***</td>
</tr>
</tbody>
</table>
**Industry** (Manufacturing, Electricity, Gas, Water, and Waste Services, Construction, Wholesale Trade, Transport, Postal and Warehousing)

**Industry** (Retail Trade, Accommodation and Food Services, Administrative and Support Services, Other Services)

**Industry** (Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, Arts and Recreation Services)

**Other demographic characteristics:**

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being a male</td>
<td>4.43***</td>
<td>4.12***</td>
<td>4.15***</td>
</tr>
<tr>
<td>Age of the migrant</td>
<td>0.20***</td>
<td>0.28***</td>
<td>0.27***</td>
</tr>
<tr>
<td>Being a business owner</td>
<td>1.13</td>
<td>-2.69</td>
<td>-2.62</td>
</tr>
<tr>
<td>Having supervising duty</td>
<td>1.60***</td>
<td>3.42***</td>
<td>3.27***</td>
</tr>
<tr>
<td>Having internet at home</td>
<td>3.42***</td>
<td>3.52***</td>
<td>3.45**</td>
</tr>
<tr>
<td>Years working for current employer</td>
<td>0.08**</td>
<td>0.09**</td>
<td>0.09*</td>
</tr>
<tr>
<td>Having health condition</td>
<td>-1.82***</td>
<td>-2.56**</td>
<td>-2.60**</td>
</tr>
<tr>
<td>Living in major urban areas</td>
<td>1.02*</td>
<td>0.51</td>
<td>0.52</td>
</tr>
<tr>
<td>SEIFA 2011 index of social-economic advantages</td>
<td>0.86***</td>
<td>0.90***</td>
<td>0.90***</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.47</td>
<td>-6.49</td>
<td>-6.38</td>
</tr>
</tbody>
</table>

| N                        | 15199 | 7238  | 7238  |

**Test for overall significance**

|                      | Ch2(25)=164 (p=0.000) | F(21,466)=50 (p=0.000) | F(21,466)=48 (p=0.000) |

Results from Table B.1 regression 1 for panel data period 2011-13 show that the hourly wage rates of both migrants and non-migrants increase over time. The hourly wage rates of migrants are higher than that of non-migrants in all the three years examined. It appears that over time, migrants’ hourly wage rates increased faster than non-migrants’ hourly wage rate. In particular, the hourly wage rates of migrants were higher than the hourly wage rates of non-migrants by 3.11, 3.65 and 5.03 dollars per hour in 2011, 2012 and 2013, respectively.

Regarding the effects of education, compared to respondents not having a bachelor or a higher degree, respondents having a bachelor degree earn about 8 dollars more per hour and respondents having a post graduate degree earn about 12 dollars more per hour on average. It appears that whether highest post school qualification is Australian or an overseas qualification makes no significant difference in hourly wage rate.

Regarding the effects of English proficiency and country of birth, compared to migrants who are not ‘very well’ in English, migrants speaking English very well earn about 5 dollars more per hour, and migrants and non-migrants with English as their only language spoken earn about 6 dollars more per
hour. Compared to respondents being born in English-speaking countries, respondents being born in non-English speaking countries earn about 3.5 dollars less per hour.

Regarding productivity in different industries, compared to respondents working in Public Administration, Education and Training, and Health Care and Social Assistance, the hourly wage rate of respondents working in Agriculture, Forestry and Fishing was about 6 dollars less per hour; respondents working in the Mining Industry earn about 11.8 dollars more per hour; respondents working in Retail Trade, Accommodation and Food Services, Administrative and Support Services earn about 4.5 dollars less per hour; respondents working in Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, and Arts and Recreation services, earn about 4 dollars more per hour. The hourly wage rate of respondents working in Manufacturing, Electricity, Gas, Water, and Waste Services, Construction, Wholesale Trade, Transport, Postal and Warehousing appears to be not significantly different from that of respondents working in Public Administration. Among other demographic characteristics, males earn a higher hourly wage rate than females by 4.4 dollars per hour. Age of the respondent has a significant and positive effect on the respondent’s hourly wage rate. An increase in the age of the respondent by one year is expected to increase the respondent’s hourly wage by 0.2 dollars per hour. Respondents having supervising duty at work earn about 1.6 dollars more per hour. Respondents having internet at home earn about 3.4 dollars per hour more than respondents without home internet. Each year of experience working for current employer increases the hourly wage rate by about 0.1 dollars. Respondents with a health condition earn about 1.8 dollars less per hour than respondents without health condition. The hourly wage rate in major urban areas is about 1 dollar higher than other areas and an area with a higher SEIFA 2011 index of social-economic advantages (which is an index developed by the ABS that ranks areas in Australia according to relative socio-economic advantage and disadvantage) has a higher hourly wage rate by 0.86 dollars per hour. Being a business owner is found to be insignificant in affecting respondents’ hourly wage rate.

For all variables that appear in both Regression 1 and Regression 2 and 3 of Table B.1, results from Regression 2 and 3 show similar results as results from Regression 1. Regarding the difference between migrants and non-migrants, an interesting result from Regression 2 is that the hourly wage rate of non-migrants is not significantly different from the hourly wage rate of migrants coming from non-English speaking countries, but the hourly wage rate of migrants coming from English speaking countries is about 8 dollars higher than the hourly wage rate of migrants coming from non-English speaking countries. Regression 3 shows that the hourly wage rate of non-migrants is not significantly different from the hourly wage rate of migrants coming from non-OECD countries, but the hourly wage rate of migrants coming from OECD countries is about 7 dollars higher than that of migrants coming from non-OECD countries.

Table B.2 reports the means and medians of hourly wage rates in 2013 for different groups of respondents and for different industries. Consistent with the results obtained from the estimated model, the average hourly wage rates are similar between non-migrants ($31 per hour), migrants born in non-English speaking countries ($32 per hour) and migrants born in non-OECD countries ($32
per hour). The hourly wage rate is much higher for migrants born in English speaking countries ($40 per hour) and migrants born in OECD countries ($39 per hour). As reported in Table B.2, the average hourly wage rate is highest in the mining industry, and second highest is in the informatics industry. The middle groups of wage rate are for manufacture and public administration. The wage rates are lowest for agriculture and retail industries.

### Table B-2 Summary statistics of hourly wage rate: HILDA data for year

<table>
<thead>
<tr>
<th>Industry group 1: Agriculture, Forestry, Fishing</th>
<th>Hourly wage rate</th>
<th>Mean</th>
<th>Median</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-migrants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrants born in non-English speaking countries</td>
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<tr>
<td>Migrants born in English speaking countries</td>
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<tr>
<td>Migrants born in OECD countries</td>
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<tr>
<td>Migrants born in non-OECD countries</td>
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</tr>
<tr>
<td><strong>Industry group 2:</strong> Mining</td>
<td></td>
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<tr>
<td>Non-migrants</td>
<td></td>
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<tr>
<td>Migrants born in non-English speaking countries</td>
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<tr>
<td>Migrants born in English speaking countries</td>
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<tr>
<td><strong>Industry group 3:</strong> Manufacture</td>
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<tr>
<td>Non-migrants</td>
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<tr>
<td>Migrants born in non-English speaking countries</td>
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<tr>
<td>Migrants born in English speaking countries</td>
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<td><strong>Industry group 4:</strong> Retail</td>
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<tr>
<td>Non-migrants</td>
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<tr>
<td>Migrants born in non-English speaking countries</td>
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<tr>
<td>Migrants born in English speaking countries</td>
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<tr>
<td><strong>Industry group 5:</strong> Informatics</td>
<td></td>
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<tr>
<td>Non-migrants</td>
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<tr>
<td>Migrants born in non-English speaking countries</td>
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<tr>
<td>Migrants born in English speaking countries</td>
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<tr>
<td><strong>Industry group 6:</strong> Public Administration</td>
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<tr>
<td>Non-migrants</td>
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<tr>
<td>Migrants born in non-English speaking countries</td>
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<td></td>
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<tr>
<td>Migrants born in English speaking countries</td>
<td></td>
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</tbody>
</table>
B.1.5 Factors affecting respondents’ probability of having a job: panel data and cross-sectional data

In the survey, the respondents were asked to provide information on employment status and whether they were employed or unemployed. Given that dependent variable in our analysis is qualitative with two alternative states (being employed and being unemployed) we estimated a probit model with maximum likelihood estimation to examine factors that affect respondents’ probability of being employed. This approach allows us to describe the probability of being employed as a function of specific characteristics.

A list of respondents’ characteristics considered include: migrant and non-migrant status; English proficiency (English is the only language spoken, speak English very well, and others); gender (male, female); age of the respondent; education (whether having a post graduate degree, whether having a bachelor degree, whether highest qualification is Australian or overseas qualification); index measuring the advantages and disadvantages of living area; whether living in major urban areas; whether having health problems, whether having internet at home; whether provided care to family members; and dummy variables for years 2012 and 2013. Table B.3 provides the marginal changes in the probability of being employed. These marginal effects were calculated using the command “mfx compute” in Stata.
Table B-3 Factors affecting respondents’ probability of being employed

<table>
<thead>
<tr>
<th>Variable</th>
<th>Marginal Effect</th>
<th>Panel data</th>
<th>2013 data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Migrant and non-migrant status:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrants and non-migrants born in English speaking countries</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrants being born in non-English speaking countries</td>
<td>-0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrant born in non-OECD countries (base)</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrant born in OECD countries</td>
<td>-0.007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-migrant</td>
<td>0.0002</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education characteristics:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having a post graduate degree</td>
<td>0.013***</td>
<td>0.02***</td>
<td></td>
</tr>
<tr>
<td>Having bachelor degree</td>
<td>0.02***</td>
<td>0.03***</td>
<td></td>
</tr>
<tr>
<td>Highest qualification is Australian qualification</td>
<td>0.013*</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td><strong>English proficiency</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not speaking English very well (base)</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speak English very well</td>
<td>0.02***</td>
<td>0.021***</td>
<td></td>
</tr>
<tr>
<td>English is the only language spoken</td>
<td>0.03**</td>
<td>0.053**</td>
<td></td>
</tr>
<tr>
<td><strong>Other demographic characteristics:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being a male</td>
<td>0.005</td>
<td>-0.001</td>
<td></td>
</tr>
<tr>
<td>Age of the respondent</td>
<td>0.004***</td>
<td>0.005***</td>
<td></td>
</tr>
<tr>
<td>Age of the respondent squared</td>
<td>-0.00003***</td>
<td>-0.00004***</td>
<td></td>
</tr>
<tr>
<td>Having internet at home</td>
<td>0.023**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having health condition</td>
<td>-0.02***</td>
<td>-0.032***</td>
<td></td>
</tr>
<tr>
<td>Caring for other members in the family</td>
<td>-0.02**</td>
<td>-0.014</td>
<td></td>
</tr>
<tr>
<td>Studying full-time</td>
<td>-0.01</td>
<td>0.016</td>
<td></td>
</tr>
<tr>
<td>Living in major urban areas</td>
<td>-0.0001</td>
<td>-0.004</td>
<td></td>
</tr>
<tr>
<td>SEIFA 2011 index of social-economic advantages/disadvantages</td>
<td>0.002***</td>
<td>0.005***</td>
<td></td>
</tr>
<tr>
<td>Dummy variables for years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2012</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2013</td>
<td>-0.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>14504</td>
<td>6641</td>
<td></td>
</tr>
<tr>
<td>Test for overall significance</td>
<td>Ch2(17)=155 (p=0.000)</td>
<td>F(16,470)=13 (p=0.000)</td>
<td></td>
</tr>
</tbody>
</table>

Our results show that there is no statistically significant difference in the probabilities of being employed between migrants and non-migrants. There is also no statistically significant difference in the probabilities of having a job between non-migrants, migrants born in OECD countries or migrants...
born in non-OECD countries. The probabilities of having a job are not significantly different between different years.

Results from panel data for the period 2011-13 show that, regarding the effects of education, compared to respondents not having a bachelor or a higher degree, respondents having a bachelor degree are 2 per cent more likely to be employed, and respondents having a post graduate degree are 1.4 per cent more likely to be employed. An interesting result is that it appears that a respondent having a bachelor degree is more likely to be employed than one having an additional higher degree such as a Master or a PhD degree. Respondents with the highest qualification being an Australian qualification are 1.3 per cent more likely to have a paid job.

Regarding the effects of English proficiency, respondents with English as the only language spoken and migrants speaking English very well are 3 per cent and 2 per cent, respectively, more likely to be employed than migrants who are less proficient in English.

Among other demographic characteristics, age of the respondent has a non-linear effect on the probability of being employed. The age of the respondent increases the probability of being in paid employment, but its marginal effect gets smaller as age increases. Respondents having internet at home are 2 per cent more likely to get a paid job. Respondents with a health condition are 2 per cent less likely to be employed than respondents without a health condition. Respondents who provided unpaid care to their family members are 2 per cent less likely to have a paid job than respondents who did not provide unpaid care to family member. Respondents living in an area with a higher SEIFA 2011 index of social-economic advantages are more likely to be employed. There is no significant difference in the probabilities of being employed between a male and a female respondent and between whether the respondent is taking full-time study or not. For almost all variables, the results from regression using panel data for the period 2011-13 are similar to the results from regression using cross-sectional data for the year 2013.

Table B.4 represents the unemployment rate for migrants and non-migrants from HILDA 2013 data. The Table shows that unemployment rates are similar between two groups of migrants and non-migrants.

<table>
<thead>
<tr>
<th></th>
<th>Unemployment rate (%)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-migrants</td>
<td>5.5</td>
<td>9368</td>
</tr>
<tr>
<td>Migrants</td>
<td>5.7</td>
<td>2327</td>
</tr>
</tbody>
</table>

Table B.5 represents the differences between migrants and non-migrants in the amount of Family Tax Benefit and total government financial support that they received in one financial year. The results show that there is no significant difference between non-migrants and migrants coming from non-English speaking countries in terms of obtaining government income support. However, migrants coming from English-speaking countries appear to require less financial support from the
government. Specifically, migrants coming from English-speaking countries received about 300 dollars less in Family Tax Benefit and about 700 dollars less in total government financial support per year, compared to non-migrants.

**Table B-5 Differences between migrants and non-migrants in family tax benefit and total government financial support: HILDA 2013 data**

<table>
<thead>
<tr>
<th>Migrant status</th>
<th>Family tax benefit $/year</th>
<th>Government financial support $/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-migrants (base)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Migrants born in non-English speaking countries</td>
<td>219</td>
<td>348</td>
</tr>
<tr>
<td>Migrants born in English speaking countries</td>
<td>-289***</td>
<td>-696**</td>
</tr>
</tbody>
</table>

Table B.6, B.7, B.8 and B.9 reports the summary statistics of the main variables in the HILDA 2013 survey data. The data shows that, out of 17,495 respondents, 78 per cent are non-migrants, 12 per cent are migrants born in non-English speaking countries and 10 per cent are migrants born in English speaking countries. Compared to non-migrants and migrants born in non-English speaking countries, a higher percentage of migrants born in English speaking countries have supervising duties at work. Compared to non-migrants, a higher proportion of migrants appear to have university education. For migrants whose English is not their first language, 61 per cent claimed that they speak English very well and 27 per cent claimed that they speak English well.

**Table B-6 Migrant status**

<table>
<thead>
<tr>
<th>Migrant status</th>
<th>Percentage of respondents (N=17495)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-migrants</td>
<td>78</td>
</tr>
<tr>
<td>Migrants born in non-English speaking countries</td>
<td>12</td>
</tr>
<tr>
<td>Migrants born in English speaking countries</td>
<td>10</td>
</tr>
</tbody>
</table>

**Table B-7 Having supervising duty**

<table>
<thead>
<tr>
<th>Having supervising duty</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-migrants</td>
<td>45</td>
<td>55</td>
<td>8729</td>
</tr>
<tr>
<td>Migrants born in non-English speaking countries</td>
<td>43</td>
<td>57</td>
<td>1226</td>
</tr>
<tr>
<td>Migrants born in English speaking countries</td>
<td>49</td>
<td>51</td>
<td>983</td>
</tr>
</tbody>
</table>

**Table B-8 Education**

<table>
<thead>
<tr>
<th>Having post graduate degree (%)</th>
<th>Having Bachelor degree (%)</th>
<th>Not have university education (%)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-migrants</td>
<td>8</td>
<td>13</td>
<td>78</td>
</tr>
</tbody>
</table>
Table B-9 English proficiency of migrants for whom English is second language

<table>
<thead>
<tr>
<th>Speak English very well (%)</th>
<th>Speak English well (%)</th>
<th>Do not speak English well (%)</th>
<th>Do not speak English at all (%)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>61</td>
<td>27</td>
<td>10</td>
<td>2</td>
<td>2017</td>
</tr>
</tbody>
</table>

B.2 Australian Population and Housing Census data 2011

B.2.1 Data

Framework: The Australian Population and Housing Census 2011 provides information on how many people there are in each part of Australia, what they do and how they live. The data record the details of all people (including visitors) who spent the night in each dwelling on Census Night, Tuesday, 9 August 2011.

Sample and selection method: Data in the Census Sample Files represent 3 per cent samples of all dwelling, family and person records from the 2011 Census of Population and Housing. The sample data is a random sample of one private dwelling in every twenty from the Census, and the associated family and person records. For non-private dwellings the sampling is applied to persons present, where five persons in every hundred are selected and the associated dwelling records included on the file.

Main information in the data includes: Age, Sex, Location, Year of arrival in Australia, Australian citizenship: Yes/No, Birthplace of female parent: Australian born/overseas, Birthplace of male parent: Australian born/overseas, Birthplace of the person: Australia/ and a list of other countries, Employment type: employee/ owner manager, Employment status: full-time, part-time, Hours worked per week, Person’s weekly income before tax: Negative/Nil/ and 10 different deciles, Industry of employment, Labour force status: employed/unemployed, Language spoken at home: English only/ and 6 other specific languages, and others specified, Highest Education, Number of children ever born, Does the person’s business employ people?: No/ Yes, 1-19/ Yes, 20 or more, Occupation skill level, Proficiency in spoken English: Very well/Well/ not well/not at all.

B.2.2 Data limitations regarding assessment of effects of migrants on Australian Productivity

The information on income in Census data was reported in different deciles; Census data has no information on visa classes and no information on where education was acquired. This prevents us
from analysing the differences in productivity, defined as the hourly wage rate, between Australian-born and overseas-born workers, between different visa classes and between education acquired in Australia or overseas.

If data on visa classes, places where highest education acquired were available and the income variable was reported as a continuous value, it would be possible to analyse differences in productivity between Australian-born and overseas-born workers, between different visa classes and between education acquired in Australia or overseas. Such analysis could also be used to assess the effects of social-cultural diversity on Australian productivity.

B.2.3 Potential estimation using Census data

Given limitations in the data available in the Census, we did not use the data from the Australian Census of Population and Housing 2011 in our quantitative analysis of labour productivity. For the purpose of examining the differences between migrants and non-migrants, we did assess the difference in probability of being employed between migrants and non-migrants:

Controlling for:

- migrants and non-migrant status
- English proficiency
- birthplace: born in English speaking and non-English speaking countries
- education level and fields of study
- gender and age

B.2.4 Empirical estimation results

We undertook a probit estimation to estimate the probability of having been employed against a range of respondent’s characteristics. Our analysis sought to answer the following questions:

- How are probabilities of being employed different between non-migrants, migrants being born in English speaking countries and migrants being born in non-English speaking countries?
- How does the education qualification affect probability of being employed?
- How does the probability of being employed vary with different levels of English proficiency?

Given that dependent variable in our analysis is qualitative, with two alternative states (being employed and being unemployed), we estimated a probit model with maximum likelihood estimation to examine factors that affect respondents’ probability of being employed. A list of respondents’ characteristics considered include: migrant and non-migrant status; English proficiency (English is the only language spoken at home, speak English very well, and others); gender (male, female); age of the respondent; education (whether having a post graduate degree, whether having a bachelor degree, fields of study of highest qualification); whether doing full-time or part-time study; whether provided care to family members. Given the potential of the model estimated to
suffer from heteroskedasticity in the error terms, we estimated the models using Heteroskedasticity-Consistent Standard Errors (HCE) and used HCE when testing for the statistical significance of variables included in the models. Table B.10 provides the marginal changes in the probability of being employed. These marginal effects were calculated using the command “mfx” in Stata.

Table B-10 Factors affecting respondents’ probability of being employed

<table>
<thead>
<tr>
<th>Variable</th>
<th>Marginal Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regression 1: migrants and non-migrants</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrant and non-migrant status:</td>
<td></td>
</tr>
<tr>
<td>Migrants being born in non-English speaking countries (base)</td>
<td>---</td>
</tr>
<tr>
<td>Non-migrants</td>
<td>0.024***</td>
</tr>
<tr>
<td>Migrants being born in English speaking countries</td>
<td>0.011***</td>
</tr>
<tr>
<td>Education characteristics:</td>
<td></td>
</tr>
<tr>
<td>Having a post graduate degree</td>
<td>0.014***</td>
</tr>
<tr>
<td>Having bachelor degree</td>
<td>0.014***</td>
</tr>
<tr>
<td>Field of highest qualification</td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>0.020***</td>
</tr>
<tr>
<td>Information technology and Engineering</td>
<td>0.008***</td>
</tr>
<tr>
<td>Education</td>
<td>0.017***</td>
</tr>
<tr>
<td>Management and commerce</td>
<td>0.004**</td>
</tr>
<tr>
<td>Food and Hospitality Services</td>
<td>0.004</td>
</tr>
<tr>
<td>English proficiency</td>
<td></td>
</tr>
<tr>
<td>Not speaking English well or not English at all (base)</td>
<td>---</td>
</tr>
<tr>
<td>Speak English well or very well</td>
<td>0.024***</td>
</tr>
<tr>
<td>English is the only language spoken</td>
<td>0.048***</td>
</tr>
<tr>
<td>Other demographic characteristics:</td>
<td></td>
</tr>
<tr>
<td>Being a male</td>
<td>0.005***</td>
</tr>
<tr>
<td>Age of the respondent</td>
<td>0.004***</td>
</tr>
<tr>
<td>Age of the respondent squared</td>
<td>-0.00004****</td>
</tr>
<tr>
<td>Caring for other members in the family</td>
<td>-0.017***</td>
</tr>
<tr>
<td>Studying full-time or part-time</td>
<td>-0.033***</td>
</tr>
<tr>
<td>N</td>
<td>64492</td>
</tr>
<tr>
<td>Wald-test for overall significance</td>
<td>Ch2(16)=1018 (p=0.000)</td>
</tr>
</tbody>
</table>
Using Census data for 2011, our results from regression 1 Table B.10 show that, non-migrants are more likely to have a paid job than migrants. Specifically, non-migrants are about 2.4 per cent more likely to be employed than migrants coming from non-English speaking countries. Migrants coming from English speaking countries are 1.1 per cent more likely to have a job than migrants coming from non-English speaking countries.

Regarding the effects of education, compared to respondents not having a bachelor or a higher degree, respondents having a bachelor degree or a post graduate degree are 1.4 per cent more likely to be employed. Compared to respondents in other fields of study, respondents where the fields of their highest qualifications are in health or education are significantly more likely to be employed; respondents where the fields of their highest qualifications are in information technology and engineering or management and commerce are slightly more likely to be employed; the probability of having a job of respondents with highest qualification is in food and hospitality services is not significantly different from the probability of having a job of respondents in other fields of study or respondents without a post-school qualification.

Regarding the effects of English proficiency, respondents with English as the only language spoken and migrants speaking English well or very well are, respectively, 4.8 per cent and 2.4 per cent more likely to be employed than migrants who are less proficient in English.

Among other demographic characteristics, males are slightly more likely to be employed than females. Age of the respondent has a non-linear effect on the probability of being employed. Age of the respondent increases the probability of having a paid job, but its marginal effect gets smaller as age increases. Respondents who provided unpaid care to their family members are 1.7 per cent less likely to have a paid job than respondents who did not provide unpaid care to family member. Respondents who are taking full-time or part-time study are about 3.3 per cent less likely to have a paid job.

Regression 2 Table B.10 shows the results of the model for migrants only. Regarding the effects of the fields of education, the results show that migrants whose fields of study are health or education are more likely to have a job than migrants in other fields of study.

Table B.11 represents the unemployment rates of migrants and non-migrants in 2006 and 2011 from the whole Census data. The results show that, for Australia as a whole, the unemployment rate remained unchanged at 5.15 per cent in 2006 and 2011. Unemployment rates of migrants were slightly higher than the unemployment rates of non-migrants in both 2006 and 2011. In 2006, the unemployment rate of migrants (5.97 per cent) was more than 1 per cent higher than the unemployment rate of non-migrants (4.89 per cent). In 2011, the unemployment rate of migrants improved relative to 2006 and was 5.23 per cent while the unemployment rate of non-migrants increased to 5.12 per cent.

The unemployment rates are lowest in Australian Capital Territory and Western Australia and highest in Tasmania. In 2011, the unemployment rates were highest in Tasmania for both migrants (7.23 per cent) and non-migrants (6.23 per cent).
Table B-11 Unemployment rate from Census data 2006 and 2011

<table>
<thead>
<tr>
<th>States and Territories</th>
<th>Non-migrants</th>
<th>Migrants</th>
<th>Both migrants and non-migrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>New South Wales</td>
<td>5.56</td>
<td>5.36</td>
<td>6.54</td>
</tr>
<tr>
<td>Victoria</td>
<td>4.72</td>
<td>4.64</td>
<td>6.98</td>
</tr>
<tr>
<td>Queensland</td>
<td>4.52</td>
<td>5.58</td>
<td>5.32</td>
</tr>
<tr>
<td>South Australia</td>
<td>5.09</td>
<td>5.20</td>
<td>5.57</td>
</tr>
<tr>
<td>Western Australia</td>
<td>3.61</td>
<td>4.50</td>
<td>3.97</td>
</tr>
<tr>
<td>Tasmania</td>
<td>6.86</td>
<td>6.23</td>
<td>5.56</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>4.41</td>
<td>6.00</td>
<td>2.43</td>
</tr>
<tr>
<td>ACT</td>
<td>3.09</td>
<td>3.35</td>
<td>4.11</td>
</tr>
<tr>
<td>Australia</td>
<td>4.89</td>
<td>5.12</td>
<td>5.98</td>
</tr>
</tbody>
</table>

Table B.12 shows unemployment rates for groups of students from Census 2011. The Table shows that 90 per cent of domestic students participated in paid employment; 91 per cent of students coming from English speaking countries were in paid employment while for students coming from non-English speaking countries, the percentage in paid employment was 80 per cent. Thus, the probability of being in paid employment was similar between domestic students and students coming from English speaking countries, but the probability was lower for students coming from non-English speaking countries.

Table B-12 Working contribution of student groups: Census 2011

<table>
<thead>
<tr>
<th>Full-time or part-time students</th>
<th>Unemployed (%)</th>
<th>Employed (%)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic students</td>
<td>10</td>
<td>90</td>
<td>9854</td>
</tr>
<tr>
<td>Students from English speaking countries</td>
<td>9</td>
<td>91</td>
<td>1262</td>
</tr>
<tr>
<td>Students from non-English speaking countries</td>
<td>20</td>
<td>80</td>
<td>2145</td>
</tr>
</tbody>
</table>

Table B.13 represents the income of different groups of students. It shows that students from English speaking countries earn higher income than domestic students and students from non-English speaking countries.

Table B-13 Income of student groups: Census 2011

<table>
<thead>
<tr>
<th>Full-time or part-time students</th>
<th>0-400 $/week</th>
<th>400-1000 $/week</th>
<th>More than 1000 $/week</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic students</td>
<td>71</td>
<td>18</td>
<td>11</td>
<td>15759</td>
</tr>
<tr>
<td>Students from English speaking countries</td>
<td>59</td>
<td>24</td>
<td>17</td>
<td>1942</td>
</tr>
<tr>
<td>Students from non-English</td>
<td>71</td>
<td>21</td>
<td>8</td>
<td>4356</td>
</tr>
</tbody>
</table>
**B.3 Continuous survey of Australia’s Migrants (CSAM)**

**B.3.1 Data**

**Framework:** CSAM measures the labour market integration of recently arrived migrants in the Skilled and Family Visa Streams. Within the Skilled stream, there are three categories including Employer Sponsored, State Sponsored and Skilled Independent visas. Migrants taking part in the CSAM are surveyed on two occasions to capture changes in their labour market status. This provides insights into the migrant integration process. Similar to the Longitudinal Survey of Immigrants to Australia, the benefit of using a longitudinal approach in CSAM is that it provides a better picture of settlement progress than would be captured from a point-in-time survey.

**Selection method and sample:** The first CSAM survey was undertaken in late September 2009. This consisted of around 8000 Primary Applicants who were granted a visa within the previous six months.

Six months later in March 2010, the next survey was run. This encompassed two separate surveys of distinct cohorts:

3. A new survey of Primary Applicants who had either arrived, or were granted their visa within the previous six months
4. A follow-up survey of the same group of migrants who had been surveyed six months earlier in September 2009

This process of introducing new migrants and following up migrants surveyed earlier was then repeated every six months until September 2011.

The second round of the CSAM survey was run in October 2013 and had a total of 8,756 migrants complete the survey. In the second round of the CSAM, the process of introducing new migrants and following up migrants surveyed earlier was then repeated every 12 months.

This data set contains data for main applicant and partner on:

- **Labour market outcomes**—including employment measures such as unemployment rates, participation rates and hours worked, and occupational outcomes such as the type of occupation and what industry people are working in, and their income.
- **Demographic and language characteristics**—including age, gender, languages spoken and spoken English proficiency, which state respondents lived in in Australia, skill level, number of children
- **Migration characteristics**—including visa subclass, year of arrival and reasons for migration
- **Educational characteristics**—level and field of study for post-school qualifications (both Australian and overseas)
- **Other characteristics**—including providing care and assistance to family and others, and undertaking non-work related activities such as domestic work or further study.
B.3.2 Potential estimation using CSAM data

The CSAM data set can be used to:

- Estimate migrants’ income equation
- Examine factors that affect migrants’ possibility of being employed

Controlling for:

- visa stream: Skilled/Family
- visa category: Sponsored/Independent
- gender and age, whether having children
- employment type: employee/ owner manager
- education separately by where acquired such as Australian or overseas qualification
- industry
- English proficiency
- birthplace: born in English speaking countries/Others
- skill level
- year arrived
- others

B.3.3 Empirical estimation results using CSAM 2013 data

Our analysis is grouped into two categories. In the first category, we regress the hourly wage rate of each respondent, dollars per hour, against a range of respondent’s demographic characteristics. In the second category, we undertake a probit estimation of the probability of being employed against a range of respondent’s characteristics. Combined, the two types of estimation seek to answer the following questions:

- How do migrants’ productivity, measured as hourly wage rate, and migrants’ probability of being employed vary between different visa categories?
- How do migrants’ productivity and migrants’ probability of being employed vary with different levels of education and with Australian qualification or overseas qualification?
- How do migrants’ productivity and migrants’ probability of being employed vary with different levels of English proficiency?
- How do migrants’ productivity and migrants’ probability of being employed vary between different migrants’ birth countries?
- How does migrants’ productivity vary between different employment types such as being an employee or being the owner of a business?
- How is migrants’ productivity different between different industries?
- How does migrants’ probability of being employed change with the length of time living in Australia?
Given the estimated model suffers from heteroskedasticity in the error terms, we estimated models using Heteroskedasticity-Consistent Standard Errors (HCE) and used HCE when testing for the statistical significance of variables included in the models.

**B.3.4 Factors affecting migrant's productivity**

We estimated a model of migrants’ hourly wage rate against migrants’ demographic characteristics including: migrants’ visa categories (employer or state sponsored, skilled independent, family dependent visa); gender (male, female); age of the migrant; visa grant location (onshore, offshore); employment type (being an employee or business owner); education (whether having an overseas post-school qualification before coming to Australia, whether having an Australian PhD degree, whether highest post-school qualification is Australian or an overseas qualification); English proficiency (English is the only language spoken, speak English very well, and others); Industry of employment; migrant’s country of birth (UK, China, India, and others); whether provided unpaid care or assistance to a family member in the last two weeks. The results are reported in Table B.14 below.

Table B.14 shows that, compared to the hourly wage of migrants coming to Australia on family dependent visas, on average, the hourly wage of employer or state sponsored migrants is 6.88 dollars higher, and the hourly wage of migrants on skilled independent visa is 3.03 dollars higher. Migrants who were granted an onshore visa earn about 1.76 dollar more per hour than migrants who were granted an offshore visa.

Regarding the effects of education, migrants having an overseas post-school qualification before coming to Australia are expected to earn 2.41 dollars per hour more than migrants without post-school qualification before coming to Australia. Having an Australian PhD degree is found to increase migrants’ hourly wage by about 17 dollars per hour. It appears that whether highest post-school qualification is Australian or overseas qualification makes no significant difference in migrants’ productivity.
### Table B-14 Factors affecting migrants' productivity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Visa characteristics:</strong></td>
<td></td>
</tr>
<tr>
<td>Employer or state sponsored</td>
<td>6.88***</td>
</tr>
<tr>
<td>Skilled independent</td>
<td>3.03*</td>
</tr>
<tr>
<td>Visa grant location: onshore</td>
<td>1.76*</td>
</tr>
<tr>
<td><strong>Education characteristics:</strong></td>
<td></td>
</tr>
<tr>
<td>Having an overseas post school qualification</td>
<td>2.41**</td>
</tr>
<tr>
<td>Having Australian PhD degree</td>
<td>16.98**</td>
</tr>
<tr>
<td>Highest qualification is Australian qualification</td>
<td>-0.486</td>
</tr>
<tr>
<td><strong>English proficiency and birth country:</strong></td>
<td></td>
</tr>
<tr>
<td>English is the only language spoken</td>
<td>5.94***</td>
</tr>
<tr>
<td>Speak English very well</td>
<td>4.24***</td>
</tr>
<tr>
<td>Birth country: UK</td>
<td>4.39**</td>
</tr>
<tr>
<td>Birth country: China</td>
<td>-3.47***</td>
</tr>
<tr>
<td>Birth country: India</td>
<td>-2.89***</td>
</tr>
<tr>
<td><strong>Industry groups:</strong></td>
<td></td>
</tr>
<tr>
<td><em>Industry</em> (base industry: Public Administration, Education and Training, and Health Care and Social Assistance)</td>
<td>---</td>
</tr>
<tr>
<td><em>Industry</em> (Agriculture, Forestry and Fishing)</td>
<td>-5.53</td>
</tr>
<tr>
<td><em>Industry</em> (Mining)</td>
<td>10.70***</td>
</tr>
<tr>
<td><em>Industry</em> (Manufacturing, Electricity, Gas, Water, and Waste Services, Construction, Wholesale Trade, Transport, Postal and Warehousing)</td>
<td>0.78</td>
</tr>
<tr>
<td><em>Industry</em> (Retail Trade, Accommodation and Food Services, Administrative and Support Services, Other Services)</td>
<td>-6.86***</td>
</tr>
<tr>
<td><em>Industry</em> (Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, Arts and Recreation Services)</td>
<td>6.02***</td>
</tr>
<tr>
<td><strong>Other demographic characteristics:</strong></td>
<td></td>
</tr>
<tr>
<td>Being a male</td>
<td>-0.08</td>
</tr>
<tr>
<td>Age of the migrant</td>
<td>0.59***</td>
</tr>
<tr>
<td>Provided unpaid care/assistance to a family member in the last 2 weeks</td>
<td>-3.71***</td>
</tr>
<tr>
<td>Being a business owner</td>
<td>-0.68</td>
</tr>
<tr>
<td>Constant</td>
<td>7.63**</td>
</tr>
</tbody>
</table>

| \(N\)                                       | 5351        |
|---                                           |            |
| *F-test for overall significance*            | *F*=48 (\(p=0.000\)) |
Regarding the effects of English proficiency and country of birth, compared to migrants who do not speak English very well, migrants with English as their only language spoken earn about 6 dollars more per hour, and migrants speaking English very well earn about 4.2 dollars more per hour. Hourly wage rates are found to be different between different migrants’ countries of birth. Migrants born in UK, China and India are found to earn about 4.4 dollars more, 3.5 dollars less and 2.9 dollars less respectively per hour compared to migrants born in other countries.

In terms of the productivity in different industries, compared to migrants working in Public Administration, Education and Training, and Health Care and Social Assistance, migrants working in the Mining Industry earn about 11 dollars more per hour; migrants working in Retail Trade, Accommodation and Food Services, Administrative and Support Services earn about 7 dollars less per hour; migrants working in Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, and Arts and Recreation services, earn about 6 dollars more per hour. Hourly wage rate of migrants working in Agriculture, Forestry and Fishing; and Manufacturing, Electricity, Gas, Water, and Waste Services, Construction, Wholesale Trade, Transport, Postal and Warehousing appears to be not significantly different from that of migrants working in Public Administration.

The age of the migrant has a significant and positive effect on migrants’ hourly wage rate. Each additional year older is expected to increase the migrant hourly wage by 0.59 dollars per hour. Migrants who had provided unpaid care/assistance to a family member in the last 2 weeks earn about 3.7 dollars less per hour compared to migrants who had not provided unpaid care to a family member. The gender of a migrant and whether they are a business owner or not are found to be insignificant in terms of migrants’ hourly wage rate.

Table B.15 represents the hourly wage rates for different groups of migrants. Migrants on employer or State sponsored visas earn the highest hourly wage ($36 per hour), migrants on skilled independent visas earn 32 dollars per hour and migrants on family dependent visas earn 27 dollars per hour, on average.

<table>
<thead>
<tr>
<th>Visa category</th>
<th>Mean $/hour</th>
<th>Median $/hour</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrants on Family dependent visa</td>
<td>27</td>
<td>22</td>
<td>1079</td>
</tr>
<tr>
<td>Migrants on Employer or State sponsored visas</td>
<td>36</td>
<td>29</td>
<td>2408</td>
</tr>
<tr>
<td>Migrants on Skilled independent visa</td>
<td>32</td>
<td>27</td>
<td>2373</td>
</tr>
</tbody>
</table>

B.3.5 Factors affecting migrants’ probability of having a job
In the survey, migrants were asked to provide information on employment status and whether they were in paid employment or not. Given that dependent variable in our analysis is qualitative, with two alternative states (having a paid job, and not having a paid job), we estimated a probit model with maximum likelihood estimation to examine factors that affect migrants’ probability of being employed. This approach allows us to describe the probability of being employed as a function of specific characteristics.

A list of migrants’ characteristics considered in the analysis includes: migrants’ visa categories (employer or state sponsored, skilled independent, family dependent visa); visa grant location (onshore, offshore); gender (male, female); age of the migrant; whether provided unpaid care to their own children in the last two weeks; years living in Australia; education (whether having an overseas post school qualification before coming to Australia, whether highest post-school qualification is Australian or overseas qualification); the field of highest post-school qualification (health, and others); English proficiency (English is the only language spoken, speak English very well, and others); and migrant’s country of birth (UK, China, India, and others); Table A2.16 provides the marginal changes in the probability of being employed. These marginal effects were calculated at the sample means using the command “mfx” in Stata.

Regression 1 of Table B.16 shows that, controlling for education, English proficiency and other demographic characteristics, compared to migrants on family dependent visas, migrants on employer sponsored visas are about 21 per cent more likely to be employed, migrants on state sponsored visa are about 11 per cent more likely to be employed; migrants on skilled independent visas are about 10 per cent more likely to have a paid job. Migrants who were granted an onshore visa are 9 per cent more likely to be employed than offshore visa migrants.

Regarding the effects of education, migrants who have as their highest post school qualification an Australian qualification are 7 per cent more likely to have a paid job. Migrants whose field of study of highest post-school qualification is in health are about 7.1 per cent more likely to have a paid job compared to migrants in other fields of study. However, overall, having an overseas post-school qualification before coming to Australia appears to be insignificant in affecting the probability of being employed.

Regarding the effects of English proficiency and birth country, migrants with English as the only language spoken and migrants speaking English very well are about 10 per cent and 8 per cent, respectively, more likely to be employed than migrants who are less proficient in English. Migrants who were born in UK are 9 per cent more likely to be employed than migrants from other countries.

Males are 12 per cent more likely to have a paid job than females. Age of the migrant has a non-linear effect on the probability of being employed. The older the age of the migrant the greater is the probability of being employed, but its marginal effect decreases with age. Migrants who provided unpaid care to their own children in the last two weeks are 22 per cent less likely to have a paid job than migrants who did not provide unpaid care to their own children. One extra year of living in Australia increases the probability of having a job by 1.8 per cent.
### Table B.16 Factors affecting migrants’ probability of being employed

<table>
<thead>
<tr>
<th>Variable</th>
<th>Marginal effect on probability of being employed</th>
<th>Regression 1</th>
<th>Regression 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Visa characteristics:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family dependent and other visas (base)</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Employer sponsored</td>
<td>0.211***</td>
<td>0.31***</td>
<td></td>
</tr>
<tr>
<td>State sponsored</td>
<td>0.110***</td>
<td>0.20***</td>
<td></td>
</tr>
<tr>
<td>Skilled independent</td>
<td>0.107***</td>
<td>0.22***</td>
<td></td>
</tr>
<tr>
<td>Visa grant location: onshore</td>
<td>0.089***</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education characteristics:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having an overseas post school qualification</td>
<td>0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest qualification is Australian qualification</td>
<td>0.070***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field of highest post school qualification: Health</td>
<td>0.071***</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>English proficiency and birth country:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English is the only language spoken</td>
<td>0.099***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speak English very well</td>
<td>0.079***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth country: UK</td>
<td>0.093***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth country: China</td>
<td>-0.030</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth country: India</td>
<td>-0.020</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other demographic characteristics:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being a male</td>
<td>0.119***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age of the migrant</td>
<td>0.026***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age of the migrant squared</td>
<td>-0.0004***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provided unpaid care to own children in the last 2 weeks</td>
<td>-0.219***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years having been living in Australia</td>
<td>0.018***</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>7483</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wald-test for overall significance</strong></td>
<td><strong>Chi2 (15) =743</strong></td>
<td><strong>(p=0.000)</strong></td>
<td></td>
</tr>
</tbody>
</table>

Regression 2 Table B.16 shows that, without controlling for other characteristics, migrants on employer sponsored visas are about 31 per cent more likely to be employed; migrants on state sponsored visas and skilled independent visas are about 20 per cent more likely to be employed, compared to migrants on family dependent visas. Both regression 1 and 2 of Table B.16 show that the probability of being employed is statistically significantly higher for migrants on Employer sponsored visa. The probability of being employed is virtually the same between migrants on State-sponsored visas and migrants on skilled independent visas.
Table B.17 reports the unemployment rates for different visa categories. The Table shows that the unemployment rate is much lower for migrants on employer sponsored visa. Unemployment rates are similar between migrants on State sponsored visa or Skilled independent visa, and highest for migrants on a family dependent visa.

**Table B-17 Unemployment rates for different visa categories: CSAM 2013**

<table>
<thead>
<tr>
<th>Visa category</th>
<th>Unemployment rate (%)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrants on Family dependent visa</td>
<td>42</td>
<td>2278</td>
</tr>
<tr>
<td>Migrants on Employer sponsored visas</td>
<td>2.7</td>
<td>1729</td>
</tr>
<tr>
<td>Migrants on State sponsored visas</td>
<td>13</td>
<td>1288</td>
</tr>
<tr>
<td>Migrants on Skilled independent visa</td>
<td>14</td>
<td>3168</td>
</tr>
</tbody>
</table>
Table B-18 Summary statistics of main variables in 2013 CSAM survey

<table>
<thead>
<tr>
<th>Visa category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer sponsored Visa</td>
<td>1795</td>
<td>20</td>
</tr>
<tr>
<td>State sponsored Visa</td>
<td>1319</td>
<td>15</td>
</tr>
<tr>
<td>Independent Visa</td>
<td>2176</td>
<td>25</td>
</tr>
<tr>
<td>Other skilled independent Visa</td>
<td>1095</td>
<td>13</td>
</tr>
<tr>
<td>Family dependent Visa</td>
<td>2371</td>
<td>27</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8756</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income a year ($)</td>
<td>0</td>
<td>1224000</td>
<td>48386</td>
<td>43000</td>
</tr>
<tr>
<td>Age (years)</td>
<td>15</td>
<td>79</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td>Hours worked</td>
<td>0</td>
<td>100</td>
<td>31</td>
<td>38</td>
</tr>
<tr>
<td>Rate of pay per hour</td>
<td>0</td>
<td>560</td>
<td>26</td>
<td>23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary applicant has overseas post school qualification</td>
<td>74</td>
<td>26</td>
<td>8756</td>
</tr>
<tr>
<td>Primary applicant has an Australian qualification</td>
<td>48</td>
<td>52</td>
<td>8756</td>
</tr>
<tr>
<td>Primary applicant has an Australian PhD degree</td>
<td>2</td>
<td>98</td>
<td>8756</td>
</tr>
<tr>
<td>Speak only English</td>
<td>47</td>
<td>53</td>
<td>8756</td>
</tr>
<tr>
<td>Speak English very well</td>
<td>40</td>
<td>60</td>
<td>4502</td>
</tr>
<tr>
<td>Being employed</td>
<td>90</td>
<td>10</td>
<td>7658</td>
</tr>
<tr>
<td>Primary applicant is a male</td>
<td>54</td>
<td>46</td>
<td>8756</td>
</tr>
<tr>
<td>Being business owner</td>
<td>5.5</td>
<td>94.5</td>
<td>8756</td>
</tr>
<tr>
<td>Working in nominated fields or in higher skill level</td>
<td>45</td>
<td>55</td>
<td>8756</td>
</tr>
<tr>
<td>Visa stream: Skilled migration</td>
<td>73</td>
<td>27</td>
<td>8756</td>
</tr>
<tr>
<td>Onshore visa</td>
<td>72</td>
<td>28</td>
<td>8756</td>
</tr>
<tr>
<td>Born in UK</td>
<td>6.5</td>
<td>93.5</td>
<td>8756</td>
</tr>
<tr>
<td>Born in China</td>
<td>13.5</td>
<td>86.5</td>
<td>8756</td>
</tr>
<tr>
<td>Born in India</td>
<td>20</td>
<td>80</td>
<td>8756</td>
</tr>
</tbody>
</table>
B.4 2012 survey of subclass 457 employers and employees

B.4.1 Data

Framework: The subclass 457 visa is a temporary work (skilled) employer sponsored visa. It allows businesses to access international labour markets for skills and technical expertise that might not otherwise be available in Australia.

The survey was conducted in May and June of 2012 and included three cohorts:

Employees—primary visa holders who were in Australia on a 457 visa on 5 May 2012 and who had received their visa between 1 October 2009 and 30 June 2011.

Current employers—who at the time of the survey were sponsoring an overseas worker on a 457 visa issued between 1 October 2009 and 30 June 2011.

Lapsed Employers—who had previously sponsored an overseas worker on a 457 visas, but at the time of the survey had not sponsored since 1 October 2009 (over two-and-a-half years).

Data collection method and sample size: The 2012 457 survey of employees was conducted in June 2012 as an online survey, sent to 15,000 with 457 primary visas. At the conclusion of the survey, 3,812 valid responses had been received.

The survey of current and lapsed employers commenced in late May 2012, using Computer Assisted Telephone Interviewing, with 1,500 and 100 responses respectively.

Main information in the 457 Visa survey data includes: Location: state living in Australia, Employment status, usual working hours, if the employee trains other workers at their companies, month/year arrived in Australia, English proficiency, nationality, gender and age, time the visa holder have been in Australia, income, other data regarding satisfaction with work and life.

B.4.2 Potential analyses using 457 Visa survey:

(1) Estimate 457 Visa holder’s income equation:

(2) Estimate the probability that the 457 visa holders train other workers at their companies

Controlling for:

- gender and age
- English proficiency
- nationality: English speaking/non English speaking country
- time the visa holder has been in Australia
- others
B.4.3 Empirical estimation results: Factors affecting the 457 migrants’ income

In the survey, information on income was provided in different ranges. Thus, we divide income into three categories: group 1 for lower income group who have income less than 60,000 dollars a year; group 2 for medium income group who have income between 60,000 and 100,000 dollars a year; and group 3 for high income group who have income more than 100,000 dollars a year. We estimate ordered probit model to examine the factors that affect the probability of being in different income groups. A list of respondents’ characteristics considered include: English proficiency (having English background, good at English, and others); gender (male, female); age of the respondent; whether training others in the company; whether working more than 35 hours per week; and industry of employment. Marginal effects on the probability of being in high income group are provided in Table B.19.

Regarding the effects of English proficiency, Table B.19 shows that, compared to the 457 visa migrants who have difficulty in English, 457 visa migrants whose background is English is about 15 per cent more likely to have a higher income, and 457 visa migrants who are good at English are about 7.5 per cent more likely to have higher income.

Males are about 12 per cent more likely to have high income than females, and the age of migrants increases the probability of having a higher income. 457 visa migrants who have provided training to other workers in their company are about 5 per cent more likely to have a higher income. The probability of being in high income group appears to be indifferent between migrants working more than 35 hours per week and migrants working less than 35 hours per week.

Regarding the effects of industry, compared to 457 visa migrants working in Public Administration, Education and Training, and Health Care and Social Assistance, 457 visa migrants working in mining industry are about 40 per cent more likely to have a higher income; 457 visa migrants working in Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, Arts and Recreation Services; are about 10 per cent more likely to have a higher income; and 457 visa migrants working in Retail Trade, Accommodation and Food Services, Administrative and Support Services are about 9 per cent less likely to have a higher income. It appears that the probability of having a higher income is not significantly different between 457 visa migrants working in Public Administration and 457 visa migrants working in Manufacturing, Electricity, Gas, Water, and Waste Services, Construction, Wholesale Trade, Transport, Postal and Warehousing, and Agriculture, Forestry and Fishing.
### Table B-19 Marginal effects on the probability of being in high income group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Marginal Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>English proficiency</strong></td>
<td></td>
</tr>
<tr>
<td>Having difficulty with English (base)</td>
<td>---</td>
</tr>
<tr>
<td>Good at English</td>
<td>0.075***</td>
</tr>
<tr>
<td>English is respondent’s first language</td>
<td>0.154***</td>
</tr>
</tbody>
</table>

| **Industry groups**                   |                 |
| **Industry** (base industry: Public Administration, Education and Training, and Health Care and Social Assistance) | ---             |
| **Industry** (Agriculture, Forestry and Fishing) | -0.074          |
| **Industry** (Mining)                  | 0.378***        |
| **Industry** (Manufacturing, Electricity, Gas, Water, and Waste Services, Construction, Wholesale Trade, Transport, Postal and Warehousing) | -0.018          |
| **Industry** (Retail Trade, Accommodation and Food Services, Administrative and Support Services, Other Services) | -0.088***       |
| **Industry** (Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, Arts and Recreation Services) | 0.106***        |

| **Other characteristics**             |                 |
| Being a male                          | 0.119***        |
| Age of the respondent                 | 0.090***        |
| Training others in the company        | 0.049***        |
| Working more than 35 hours per week   | 0.030           |

| **N**                                 | 2593            |

| **Test for overall significance**    | Chi2(11)=541    |
|                                      | (p=0.000)       |

#### B.4.4 Empirical estimation results: factors affecting the likelihood of 457 visa holders who have provided training at work

In the survey, the respondents were asked whether they had trained other workers at their work place. Given the dependent variable is qualitative with two alternatives states (had trained other
workers and had not trained other workers) we estimated a probit model with maximum likelihood estimation to examine factors that affect respondents’ probability of having training duty. The list of explanatory variables include gender (male, female), age of the respondent, whether working full-time or not, time the respondent has been in Australia, whether English is respondent’s first language. Table B.20 provides the marginal changes in the probability of having provided training to fellow employees. These marginal effects were calculated using the command “mfx” in Stata.

**Table B-20 Marginal effects on probability of having training duty**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Marginal Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>English is respondent’s first language</td>
<td>0.034**</td>
</tr>
<tr>
<td>Being a male</td>
<td>0.070***</td>
</tr>
<tr>
<td>Age of the respondent</td>
<td>0.010**</td>
</tr>
<tr>
<td>Time having been in Australia</td>
<td>0.140***</td>
</tr>
<tr>
<td>Working full time</td>
<td>0.072</td>
</tr>
</tbody>
</table>

| N                                     | 3436            |

| Wald test for overall significance    | Chi2(5)=60 (p=0.000) |

Table B.20 shows that the 457 visa migrants whose English is first language are about 3.4 per cent more likely to have trained other workers at their company. A male is 7 per cent more likely to have provided training than a female. One more year living in Australia increases the probability of having training duty by about 14 per cent. The likelihood of having provided training increases with age of the respondent, while whether working full time or part time does not affect the probability of having trained fellow workers.

**B.4.5 Employer data**

Tables B.21 and B.22 report the number of firms facing difficulty in hiring workers from local market and the roles for which employers had difficulty hiring people. Out of 1,478 firms in the survey, 43 per cent stated that it was very difficult for them to hire workers from the local market and 41 per cent of the firms found it somewhat difficult in hiring workers from local market. The most popular roles that firms had difficulty in hiring people for are professionals, technicians and trade workers, and managers.

**Table B-21 Difficulty in hiring workers from local market**

<table>
<thead>
<tr>
<th></th>
<th>Number of firms</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very difficult</td>
<td>636</td>
<td>43</td>
</tr>
<tr>
<td>Somewhat difficult</td>
<td>609</td>
<td>41</td>
</tr>
<tr>
<td>Not difficult</td>
<td>233</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1478</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Table B.22 Roles employers had difficulty hiring people for

<table>
<thead>
<tr>
<th>Roles</th>
<th>Number of firms had difficulty hiring people for</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers</td>
<td>145</td>
<td>9.7</td>
</tr>
<tr>
<td>Professionals</td>
<td>582</td>
<td>39</td>
</tr>
<tr>
<td>Technicians and trade workers</td>
<td>395</td>
<td>26</td>
</tr>
<tr>
<td>Community and personal service workers</td>
<td>117</td>
<td>7.8</td>
</tr>
<tr>
<td>Clerical and administrative workers</td>
<td>46</td>
<td>3.1</td>
</tr>
<tr>
<td>Sales workers</td>
<td>45</td>
<td>3.0</td>
</tr>
<tr>
<td>Machinery operators and drivers</td>
<td>34</td>
<td>2.3</td>
</tr>
<tr>
<td>Labourers</td>
<td>51</td>
<td>3.4</td>
</tr>
<tr>
<td>Other roles</td>
<td>107</td>
<td>7.1</td>
</tr>
<tr>
<td>All roles</td>
<td>28</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Total number of firms</strong></td>
<td><strong>1502</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table B.23 shows that out of 1,502 employers in the survey, 55 per cent found difficulties in hiring workers because there were not enough local workers with the right skills; 9 per cent found it difficult to hire workers because the business was in a remote location. The greatest number of firms reported that the next step to find employees is to seek employees overseas.

Table B.23 Reasons for difficulties in hiring workers

<table>
<thead>
<tr>
<th>Reason</th>
<th>Number of firms selected this reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are not enough local workers with the right skills</td>
<td>823</td>
<td>55</td>
</tr>
<tr>
<td>Business is in remote location</td>
<td>132</td>
<td>9.0</td>
</tr>
<tr>
<td>Australian workers do not like doing this job</td>
<td>120</td>
<td>8.0</td>
</tr>
<tr>
<td>Other employers in my industry offer better paid job</td>
<td>78</td>
<td>5.2</td>
</tr>
<tr>
<td>There are better paid jobs in other industries</td>
<td>174</td>
<td>12</td>
</tr>
<tr>
<td>Need workers who speak a language other than English</td>
<td>22</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total number of employers</strong></td>
<td><strong>1502</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table B.24 Next step to find employees

<table>
<thead>
<tr>
<th>Next step to find employees</th>
<th>Number of firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broaden the job specification including required skills</td>
<td>93</td>
</tr>
<tr>
<td>Increase the salary being offered</td>
<td>15</td>
</tr>
<tr>
<td>Seek overseas workers</td>
<td>501</td>
</tr>
<tr>
<td>Seek local workers from other business in local area</td>
<td>136</td>
</tr>
<tr>
<td>Train internal employees in the required skills</td>
<td>207</td>
</tr>
<tr>
<td>Put the position on hold till the right person turns up locally</td>
<td>158</td>
</tr>
<tr>
<td>Keep looking/continue advertising</td>
<td>148</td>
</tr>
<tr>
<td>Contact recruitment agency</td>
<td>366</td>
</tr>
<tr>
<td>Search linkedin/Seek</td>
<td>219</td>
</tr>
<tr>
<td><strong>Total number of employers</strong></td>
<td><strong>1502</strong></td>
</tr>
</tbody>
</table>
Tables B.25, B.26 and B.27 report the overall satisfaction of employers and their benefits of sponsoring. Only a small number of firms were not satisfied with the 457 visa programme. Out of 1502 firms, 95 per cent of the firms stated that they benefitted from sponsoring overseas workers. Out of 1,353 employers, 77 per cent stated that 457 visa workers helped in the training and development of Australian workers.

### Table B-25 Overall satisfaction with 457 visa programme

<table>
<thead>
<tr>
<th></th>
<th>Very satisfied</th>
<th>Satisfied</th>
<th>Neither</th>
<th>Dissatisfied</th>
<th>Very dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of firms</td>
<td>204</td>
<td>193</td>
<td>909</td>
<td>62</td>
<td>40</td>
</tr>
<tr>
<td>Percentage</td>
<td>14.5</td>
<td>13.7</td>
<td>64.6</td>
<td>4.4</td>
<td>2.8</td>
</tr>
</tbody>
</table>

### Table B-26 Benefits of sponsoring

<table>
<thead>
<tr>
<th>Benefits of sponsoring</th>
<th>Number of firms</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>They have filled skilled job vacancies</td>
<td>774</td>
<td>728</td>
</tr>
<tr>
<td>They are highly skilled workers</td>
<td>494</td>
<td>1008</td>
</tr>
<tr>
<td>They are hardworking and have better attitude</td>
<td>269</td>
<td>1233</td>
</tr>
<tr>
<td>They have passed their skills and experience onto others</td>
<td>234</td>
<td>1268</td>
</tr>
<tr>
<td>They required little training</td>
<td>55</td>
<td>1447</td>
</tr>
<tr>
<td>No benefits</td>
<td>71</td>
<td>1431</td>
</tr>
</tbody>
</table>

### Table B-27 Do 457 visa workers help in the training and development of Australian workers?

<table>
<thead>
<tr>
<th>Do 457 visa workers help in the training and development of Australian workers</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1043</td>
<td>288</td>
<td>1353</td>
</tr>
</tbody>
</table>
Table B-28 Summary statistics of main variables for 457 visa holders

<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training other workers in the company</td>
<td>78</td>
<td>22</td>
<td>3481</td>
</tr>
<tr>
<td>Having English background</td>
<td>51</td>
<td>49</td>
<td>3574</td>
</tr>
<tr>
<td>Good at English</td>
<td>65</td>
<td>35</td>
<td>1768</td>
</tr>
<tr>
<td>Being a male</td>
<td>64</td>
<td>36</td>
<td>3574</td>
</tr>
<tr>
<td><strong>Industry</strong> (Agriculture, Forestry and Fishing)</td>
<td>0.8</td>
<td>99.2</td>
<td>3571</td>
</tr>
<tr>
<td><strong>Industry</strong> (Mining)</td>
<td>3.6</td>
<td></td>
<td>3571</td>
</tr>
<tr>
<td><strong>Industry</strong> (Manufacturing, Electricity, Gas, Water, and Waste Services, Construction, Wholesale Trade, Transport, Postal and Warehousing)</td>
<td>15.4</td>
<td></td>
<td>3571</td>
</tr>
<tr>
<td><strong>Industry</strong> (Retail Trade, Accommodation and Food Services, Administrative and Support Services, Other Services)</td>
<td>27.8</td>
<td></td>
<td>3571</td>
</tr>
<tr>
<td><strong>Industry</strong> (Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, Arts and Recreation Services)</td>
<td>27</td>
<td></td>
<td>3571</td>
</tr>
<tr>
<td><strong>Industry (base industry): Public Administration, Education and Training, and Health Care and Social Assistance</strong></td>
<td>25.4</td>
<td></td>
<td>3571</td>
</tr>
</tbody>
</table>

B.5 Australia’s Working Holiday Maker Programme (WHM)

B.5.1 Data

**Framework:** Australia’s Working Holiday Maker (WHM) programme, which commenced in 1975, is a temporary migration mechanism to allow young people from nominated nations to travel, work and study in Australia. The WHM programme includes two visa subclasses (417 and 462). The subclass 417 stream allows people aged 18-30 years from 19 nations under arrangements to experience Australian culture and lifestyle through an extended holiday and incidental employment, with a special focus on regional Australia. The 19 nations with whom such an arrangement is in place are Belgium, Canada, the Republic of Cyprus, Denmark, Estonia, Finland, France, Germany, Hong Kong, the Republic of Ireland, Italy, Japan, the Republic of Korea, Malta, the Netherlands, Norway, Sweden, Taiwan, and the United Kingdom (UK). The subclass 462 stream allows tertiary educated persons aged 18-30 years with functional English from five other countries to holiday in Australia and supplement their travel funds through short-term employment. These five countries are: Chile, Thailand, Turkey, the United States (US), and Malaysia. The Malaysian arrangement commenced on 1 February 2009, and, thus, is not included in the WHM 2008 survey.

**Data collection method and sample size:** The WHM 2008 survey included 20,444 WHMs during the period late August to mid-October 2008. The sample accounted for 14.8 per cent of the total WHM arrivals in 2007-08. The surveyed population was all WHMs who came to Australia on a 417 or 462 visa and departed Australia between January 2007 and August 2008. As the WHM Survey was conducted via the Internet, only persons who completed their visa application online (around 99 per cent of 417 and 462 visa holders) and who provided a valid email address were included.
Main information in the WHM data includes: Migrants’ demographics (English proficiency, gender, age, citizenship, education), location of living in Australia, job in Australia, whether working in a farm, hours worked, income, expenditure.

B.5.2 Potential estimation using WHM data

Data from WHM programme survey can be used to track which industries attract the most temporary migrants. The survey can also be used to compare the average income of temporary migrants between different industries and to assess the probability of taking farm work after controlling for gender, age, English proficiency, education, reason for visiting Australia and whether having visited Australia before.

B.5.3 Comparison of hourly wage rates of temporary migrants on WHM programme and temporary and permanent migrants and non-migrants from HILDA survey

Table B.29 represents the mean and median of hourly wage rates of temporary migrants on Working Holiday Marker programme in 2008 in comparison to the mean and median of hourly wage rates of both temporary and permanent migrants, and of non-migrants in 2008 from HILDA 2008 survey. The results show that for Australia, as a whole, as well as for each group of industries, the hourly wage rates of temporary migrants on Working Holiday Marker programme are much lower than the average hourly wage rates of both temporary and permanent migrants and the hourly wage of non-migrants.

On average, the mean of the hourly wage rate of temporary migrants is 16 dollars per hour, while the mean of the hourly wage rate of all migrants is 29 dollars per hour and that of non-migrants is 26 dollars per hour. A possible reason for having a lower hourly wage rate for temporary migrants on WHM is that those migrants only came and stayed a short time in Australia. Thus, they may not have sufficient time to participate in the labour market to find a more highly paid job. Most of the temporary migrants found a job in the agricultural industry and retail industry including café, restaurant, fast food, pub, accommodation and other services in which the wage rates are lower compared to other industries.
<table>
<thead>
<tr>
<th>Industry group</th>
<th>Temporary migrants (WHM 2008)</th>
<th>Mean</th>
<th>Median</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>16</td>
<td>16</td>
<td>20443</td>
<td></td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>24</td>
<td>1344</td>
<td></td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>22</td>
<td>6265</td>
<td></td>
</tr>
<tr>
<td>Industry group 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture,</td>
<td>15</td>
<td>15</td>
<td>5461</td>
<td></td>
</tr>
<tr>
<td>Forestry, Fishing</td>
<td>19</td>
<td>19</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>17</td>
<td>134</td>
<td></td>
</tr>
<tr>
<td>Industry group 2:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mining</td>
<td>24</td>
<td>22</td>
<td>176</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>39</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>36</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>Industry group 3:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacture</td>
<td>17</td>
<td>17</td>
<td>2655</td>
<td></td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>23</td>
<td>348</td>
<td></td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>23</td>
<td>1487</td>
<td></td>
</tr>
<tr>
<td>Industry group 4:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retail</td>
<td>15</td>
<td>15</td>
<td>13407</td>
<td></td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>19</td>
<td>256</td>
<td></td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>17</td>
<td>1521</td>
<td></td>
</tr>
<tr>
<td>Industry group 5:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informatics</td>
<td>21</td>
<td>19</td>
<td>1673</td>
<td></td>
</tr>
<tr>
<td></td>
<td>39</td>
<td>28</td>
<td>265</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>24</td>
<td>1023</td>
<td></td>
</tr>
<tr>
<td>Industry group 6:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>21</td>
<td>20</td>
<td>1320</td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>32</td>
<td>28</td>
<td>433</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>25</td>
<td>1919</td>
<td></td>
</tr>
</tbody>
</table>

Table B.30 represents the State or Territory locations that temporary migrants on WHM programme visited for more than one week. It shows that most of the visitors visited New South Wales and Queensland. The next most popular destinations were Victoria and Western Australia. The results show that 32 per cent of the visits were to work, 45 per cent of the visits were for tourism and 23 per cent were for other reasons. Western Australia and Queensland were the two States that attracted the most visitors to come to work, with, respectively, 40 per cent and 34 per cent of the visits for working reasons.
In the survey, the respondents were asked to provide information on their employment during their visit to Australia and whether they undertook farm work. Of the 20,315 respondents who provided answers for this question, 41 per cent of the respondents undertook farm work and 59 per cent of the respondents undertook non-farm work. Given that the dependent variable in our analysis is qualitative, with two alternative states (doing farm work and not doing farm work), we estimated a probit model with maximum likelihood estimation to examine factors that affect respondents’ probability of taking farm work. This allows us to describe the probability of taking farm work as a function of specific characteristics. A list of respondents’ characteristics considered includes: gender (male and female); age of the respondent; English proficiency (English is the only language spoken, speak English very well, speak English well and others); education (whether having a university degree; whether having a trade qualification, and high school and lower). The model suffers from heteroskedasticity in the error terms. Thus, we estimated the model using Heterokedasticity-Consistent Standard Errors (HCE) and used HCE when testing for the statistical significance of variables included in the models. Table B.31 provides the marginal changes in the probability of taking farm work. These marginal effects were calculated using the command ‘‘mfx’’ in Stata.

Regression 1 of Table B.31 shows that temporary migrants having a university qualification are about 10 per cent less likely to do farm work compared to temporary migrants without university education. Compared to visitors who do not speak English well or do not speak English at all, visitors who speak English best are 17 per cent less likely to take farm work, visitors who speak English very well and who speak English well are about 12 per cent and 4.5 per cent less likely to take farm work, respectively. Males are about 2.6 per cent more likely to do farm work than female. Visitors whose reason for visiting Australia is to work are about 2 per cent more likely to do farm work, and visitors who have visited Australia before are about 10 per cent less likely to choose farm work.

Regression 2 of Table B.31 shows that visitors on visa subclass 417 are 32 per cent more likely to do farm work while visiting Australia compared to visitors on visa subclass 462. A possible reason for this finding is that visitors on 462 visas have a tertiary education and satisfy English requirements to be granted a visa, while visitors on 417 visa are not required to satisfy education and English
requirements. Thus, visitors on 462 visas have higher education and/or are more fluent in English compared to visitors on 417 visas. Consequently, they are less likely to take farm work while visiting Australia.

Table B-31 Marginal effects on probability of taking farm work

<table>
<thead>
<tr>
<th>Variables</th>
<th>Marginal Effects</th>
<th>Regression 1</th>
<th>Regression 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Visa subclasses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visa 462 (base)</td>
<td>---</td>
<td></td>
<td>0.324***</td>
</tr>
<tr>
<td>Visa 417</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school or lower (base)</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having trade qualification</td>
<td>-0.011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having a university qualification</td>
<td>-0.102***</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>English proficiency</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaking English not well or not at all (base)</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speak English well</td>
<td>-0.045***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speak English very well</td>
<td>-0.119***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speak English best</td>
<td>-0.168***</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other demographic characteristics:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being a male</td>
<td>0.026***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age of the respondent</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visiting Australia to work</td>
<td>0.019***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having visited Australia before this time</td>
<td>-0.098***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>20132</td>
<td>20315</td>
<td></td>
</tr>
<tr>
<td>Test for overall significance</td>
<td>Ch2(10)=790</td>
<td>Ch2(1)=157</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(p=0.000)</td>
<td>(p=0.000)</td>
<td></td>
</tr>
</tbody>
</table>
Table B-32 Visa subclasses and percentage of respondents

<table>
<thead>
<tr>
<th>Visa Subclass</th>
<th>Number of respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>417</td>
<td>20053</td>
<td>98.1</td>
</tr>
<tr>
<td>462</td>
<td>390</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20443</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table B-33 Summary Statistics of main characteristics in WHM Programme

<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being a male</td>
<td>47</td>
<td>53</td>
<td>20443</td>
</tr>
<tr>
<td>Highest education: University degree</td>
<td>54</td>
<td>46</td>
<td>20444</td>
</tr>
<tr>
<td>Study for another qualification</td>
<td>35</td>
<td>65</td>
<td>20294</td>
</tr>
<tr>
<td>WHM with English as first language</td>
<td>40</td>
<td>60</td>
<td>20273</td>
</tr>
<tr>
<td>Speaking English very well (English not first language)</td>
<td>32</td>
<td>68</td>
<td>12134</td>
</tr>
</tbody>
</table>

Table B-34 Hours worked and earnings of different age groups and gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>Hourly wage (Mean)</th>
<th>Hours worked per day (Mean)</th>
<th>Average earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>15.8</td>
<td>7.0</td>
<td>4183</td>
</tr>
<tr>
<td>Male</td>
<td>16.7</td>
<td>7.5</td>
<td>5119</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-19</td>
<td>14.9</td>
<td>7.2</td>
<td>2435</td>
</tr>
<tr>
<td>20-24</td>
<td>15.6</td>
<td>7.2</td>
<td>4064</td>
</tr>
<tr>
<td>25-30</td>
<td>16.8</td>
<td>7.3</td>
<td>5556</td>
</tr>
<tr>
<td>&gt;30</td>
<td>18.1</td>
<td>7.2</td>
<td>6494</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16.2</strong></td>
<td><strong>7.3</strong></td>
<td><strong>4638</strong></td>
</tr>
</tbody>
</table>

B.6 List of variables

**Migrants and visa characteristics:**

- Non-migrant year 2011 *(base category)*: Dummy variable, = 1 if the respondent is a non-migrant and the observation is in year 2011, =0 otherwise
- Non-migrant year 2012: Dummy variable, = 1 if the respondent is a non-migrant and the observation is in year 2012, =0 otherwise
- Non-migrant year 2013: Dummy variable, = 1 if the respondent is a non-migrant and the observation is in year 2013, =0 otherwise
- Migrant year 2011: Dummy variable, = 1 if the respondent is a migrant and the observation is in year 2011, =0 otherwise
- Migrant year 2012: Dummy variable, = 1 if the respondent is a migrant and the observation is in year 2012, =0 otherwise
- Migrant year 2013: Dummy variable, = 1 if the respondent is a
migrant and the observation is in year 2013, =0 otherwise

Employer or state sponsored: Dummy variable, = 1 if the migrant is sponsored by an employer or State, =0 otherwise

Skilled independent: Dummy variable, = 1 if the migrant was granted skilled independent visa, =0 otherwise

Visa grant location: Onshore: Dummy variable, = 1 if the migrant was granted an visa onshore, =0 otherwise

Visa 462: dummy variable, =1 if the temporary migrant holds visa subclass 462, =0 if not

Visa 417: dummy variable, =1 if the temporary migrant holds visa subclass 417, =0 if not

**Education Characteristics:**

Having a post graduate degree: Dummy variable, =1 if the respondent has a post graduate degree, =0 otherwise

Having a bachelor degree: Dummy variable, =1 if the respondent has a bachelor degree, =0 otherwise

Having an overseas post school qualification: Dummy =1 if the migrant has an overseas post school qualification before coming to Australia, =0 otherwise

Having Australian PhD degree: Dummy variable, =1 if the migrant has Australian PhD degree, =0 otherwise

Having trade qualification: dummy variable, =1 if the temporary migrant has a trade qualification, =0 otherwise

Having a university qualification: dummy variable, =1 if the temporary migrant has a university qualification, =0 otherwise

Highest qualification is Australian qualification: Dummy variable, =1 if the migrant’s highest post school qualification is an Australian qualification, =0 otherwise

Field of highest qualification: Health: Dummy variable, =1 if the field of highest qualification is in Health, =0 otherwise

Field of highest qualification: Information Technology and Engineering: Dummy variable, =1 if the field of highest qualification is in Information Technology and Engineering, =0 otherwise

Field of highest qualification: Education: Dummy variable, =1 if the field of highest qualification is in Education, =0 otherwise

Field of highest qualification: Management and Commerce: Dummy variable, =1 if the field of highest qualification is in Management and Commerce, =0 otherwise

Field of highest qualification: Food and Hospitality Services: Dummy variable, =1 if the field of highest qualification is in Food and Hospitality Services, =0 otherwise
Highest qualification is Australian qualification: Dummy variable, =1 if the respondent’s highest post school qualification is an Australian qualification, =0 otherwise

**English proficiency and birth countries:**

English is the only language spoken: Dummy variable, = 1 if English is the only language the respondent speaks, =0 otherwise
Speak English very well: Dummy variable, =1 if the respondent speaks English very well, =0 otherwise
Speak English well: dummy variable, =1 if the temporary migrant speaks English well, =0 otherwise
Speak English best: dummy variable, =1 if the temporary migrant speaks English best, =0 otherwise
Speak English well or very well: Dummy variable, =1 if the respondent speaks English well or very well, =0 otherwise
Having difficulty with English: Dummy variable, =1 if the migrant has difficulty in English, =0 if not
Good at English: Dummy variable, =1 if the migrant has never had any difficulty with English, =0 if not
English is respondent’s first language: Dummy variable, =1 if English is migrant’s first language, = 0 if not
Being born in English speaking countries (base): Dummy variable, = 1 if the respondent was born in an English-speaking country, =0 otherwise
Being born in non-English speaking countries: Dummy variable, = 1 if the respondent was born in a non-English-speaking country, =0 otherwise
Birth country: UK: Dummy variable, = 1 if the migrant was born in UK, =0 otherwise
Birth country: China: Dummy variable, =1 if the migrant was born in China, =0 otherwise
Birth country: India: Dummy variable, =1 if the migrant was born in China, =0 otherwise

**Industry groups:**

*Industry (Agriculture, Forestry and Fishing):* Dummy variable, = 1 if the respondent works in industry of Agriculture, Forestry or Fishing, =0 otherwise

*Industry (Mining):* Dummy variable, = 1 if the respondent works in Mining industry

*Industry (Manufacturing, Electricity, Gas, Water, and Waste Services, Construction, Wholesale Trade, Transport, Postal and Warehousing):* Dummy variable: = 1 if the respondent works in one of the followings: Manufacturing, Electricity, Gas, Water, and
Waste Services, Construction, Wholesale Trade, Transport, Postal and Warehousing; =0 otherwise

**Industry (Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, Arts and Recreation Services):**

Dummy variable, =1 if the respondent works in one of the following: Information Media and Telecommunications, Financial and Insurance Services, Rental, Hiring and Real Estate Services, Professional, Scientific and Technical Services, Arts and Recreation Services; =0 otherwise

**Industry (Retail Trade, Accommodation and Food Services, Administrative and Support Services, Other Services):**

Dummy variable, =1 if the respondent works in one of the following: Retail Trade, Accommodation and Food Services, Administrative and Support Services, and other Services; =0 otherwise

**Industry (Public Administration, Education and Training, and Health Care and Social Assistance):**

Dummy variable, =1 if the respondent works in one of the following: Public Administration, Education and Training, and Health Care and Social Assistance; =0 otherwise

**Other characteristics:**

Being a male: Dummy variable, = 1 if the respondent is a male, =0 if the respondent is a female

Age of the migrant: Is age of the respondent

Age of the migrant squared: is the square of the age of the respondent

Age of the respondent: is age of the respondent

Being a business owner: Dummy variable, = 1 if the respondent is the owner of a business; =0 otherwise

Having supervising duty: Dummy variable, =1 if the respondent supervises others at work, =0 otherwise

Having internet at home: Dummy variable, =1 if the respondent has internet access at home, =0 otherwise

Training others in the company: Dummy variable, =1 if the migrant trained other workers in the company, =0 if not

Working more than 35 hours per week: Dummy variable, =1 if the migrant works more than 35 hours per week, =0 if not

Years working for current employer: Number of years working for current employer

Having health condition: Dummy variable, =1 if the respondent has health problems, =0 otherwise

Years having been living in Australia: number of years the migrant has been living in Australia
Visiting Australia to work: dummy variable, =1 if the temporary migrant visits Australia to work, =0 otherwise

Having visited Australia before this time: dummy variable, =1 if the temporary migrant have visited Australia before the current time, =0 otherwise

Living in major urban areas: Dummy variable, =1 if the temporary migrant have visited Australia before the current time, =0 otherwise

SEIFA 2011 index of social-economic advantages and disadvantages: The index measures social-economic advantages and disadvantages, higher value means more advantageous

Provided unpaid care to own children in last the two weeks: Dummy variable, =1 if the migrants provided unpaid care to own children in last the two weeks; =0 otherwise

Provided unpaid care/assistance to a family member: Dummy variable, =1 if the respondent provided unpaid care/assistance to a family; =0 otherwise

Studying full-time: Dummy variable, =1 if the respondent is undertaking full-time study, =0 otherwise

Studying full-time or part-time: Dummy variable, =1 if the respondent is undertaking full-time study, =0 otherwise

Year 2012: Dummy variable, =1 if the observation is in year 2012, =0 otherwise

Year 2013: Dummy variable, =1 if the observation is in year 2013, =0 otherwise
Appendix C

ANNOTATED BIBLIOGRAPHY

This bibliography uses edited abstracts and summaries of papers. Australian literature is generally considered first in each section, followed by international work.

The bibliography was undertaken at the start of the project. Further material and references are included in the final report.

C.1 Summary

This bibliography has been prepared to inform research on the linkages between migration, mobility and productivity in Australia. The research is being undertaken as part of an agreement between The Australian National University and the Commonwealth Department of Immigration and Border Protection.

Main research themes

The literature covers domestic and international research on the range of factors that might explain the links between migration, mobility and productivity. The aim of this review has been to scope the main areas of literature relevant to the research project rather than a full academic literature review of each area of study.

The main areas of literature relate to:

- understanding productivity and the challenges of measuring and explaining its causes
- the links between migration, productivity and the economy, including the economic benefits to migrants and non-migrants
- the employment outcomes of migrants and the integration of migrants into the host labour market
- the savings and wealth-holding of migrants compared to non-migrants
- the settlement behaviour of migrants and the impact of migrant policies that have aimed to encourage migrants to settle in regional areas
- the connections that migrants have within their host country and with their country of origin, and the impact this might have on trade and investment networks
- the education and skill levels of migrants compared with non-migrants and whether migrants are ‘over-educated’
- the relationship between migration and innovation
- the barriers to integration such as discrimination and host language proficiency
- policy developments (related to the economic impact of migration) and the evaluation of relevant immigration policies.
Overview of each research theme

**Explaining productivity**
A wide literature exists on defining and measuring productivity and identifying the underlying causes of changes to productivity. This bibliography includes a few recent papers (Kennedy (2013), DISRTE (2013)) covering key concepts, trends and debates.

**Migration, the economy and productivity**
A range of factors explain how migration affects the economy and productivity. (These factors are covered separately in more detail below). A number of studies are included here which inform the broad framework for understanding these links, most notably the Productivity Commission’s 2006 inquiry into the Economic Impacts of Migration and Population Growth (Productivity Commission, 2006) and supporting papers (Econtech, 2006 and Giesecke & Meagher, 2006).

A number of other papers are included which explore the economic consequences of migration to Australia. Withers (2003) provides an overview of the economic aspects of migration and Hugo (2014) specifically considers the economic contribution of humanitarian settlers. The Productivity Commission’s 2010 research paper on Population and Migration (Productivity Commission, 2010) is also included, which explores the economic effects of immigration and population growth concluding they are diverse and depend on source, composition and context.

Some key international literature is included which explores the economic effects of migration in other countries. Borjas (1995, 2013) considers and reviews the economic benefits of immigration in the US context and analyses the benefits to natives. Friedberg and Hunt (1995) provide an overview of the theoretical and empirical research on immigration’s impact on income growth and labour market outcomes of natives. Büchel and Frick (2005) explore the economic performance of immigrants and natives across Europe.

Rolfe et al (2013) use quantitative and qualitative methods (engaging employers and employees) to look at the connections between migration and productivity. This paper also summarises existing studies of the impact of immigration on firms (for example, through complementarity and transmission of skills, aptitudes and knowledge of migrants and non-migrants, through raising overall skill levels, and through bringing in knowledge and connections from and with other countries.)

**Labour market outcomes**
Domestic and international studies have explored the employment outcomes of migrants and the integration of migrants into the host labour market.

Several studies have tried to disentangle ‘self-selection’ and ‘state/government selection’ to improve understanding of the labour market performance of migrants (see Borjas (1987), and Anetecol et al (2003) and Cobb-Clark (2000) for Australia).

More recently, Cobb-Clark et al (2012) compares methods for estimating immigrant wage and employment assimilation and Breunig et al (2013) looks specifically at accounting for unobservable differences (such as ambition and motivation) in their analysis. Both of these papers use HILDA data.

Gregory (2014) points to the ‘two-step’ Australian immigration policy (moving from temporary to permanent visa status) and uses Labour Force Survey data to reveal its labour market consequences. (This paper also provides an overview of some of the inadequacies of current data availability in Australia, in particular the lack of information on temporary migrants and the experience of those moving from temporary to permanent visa status).

**Savings and investment**

The literature (domestic and international) shows that immigrants typically have less wealth and hold it in different forms than non-migrants.

For example, Bauer et al (2011) investigate the wealth of immigrant households in Australia, Germany and the United States. This study concludes that, in Australia, the wealth gap exists because immigrants to Australia do not translate their relative educational and demographic advantages into a wealth advantage.

**Settlement**

A diverse range of studies look at how and where immigrants settle. Hatton and Leigh (2011) argue immigrants assimilate as communities, not only as individuals.

Wulff et al (2008) examine the ‘new paradigm’ in international migration, that is, regional migration policies that encourage new arrivals to settle in hinterlands or low-growth areas, rather than major cities. Taylor et al (2014) explore the benefits of skilled migration programmes for regional Australia—the Regional Sponsored Migration Scheme (RSMS) and the State Specific Regional Migration (SSRM)—and conducted on-line surveys with recent migrants to assess the contribution of RSMS and SSRM to attract and retain skilled workers to the Northern Territory of Australia.

A DIBP (2014) research paper also investigates the critical success factors that facilitate migrant retention in regional communities, as well as the broader trends that might influence regional settlement patterns.

**Connectedness**

A number of studies consider the connections that migrants have within the host country and with their country of origin and, in particular, the impact this might have on trade and investment networks.

The Productivity Commission’s 2008 working paper (Productivity Commission, 2008) explores the links between migration, trade and investment, suggesting migrant networks are important to patterns of trade and investment.


Belot and Ederveen (2011) examine the cultural differences in migration between OECD countries, suggesting cultural differences explain migration flows better than traditional economic variables (such as income and unemployment differentials). Tadesse and White (2010) ask whether
immigrants counter the effects of cultural differences between countries, with their analysis showing immigrants exert a pro-export effect that partially offsets the trade-inhibiting effects of ‘cultural distance’. Peri and Requena-Silvente (2010) find immigrants significantly increase exports in the case of Spain.

Fullilove and Flutter (2004) examine the ‘world-wide web’ of the Australians and describe economic research indicating that emigration can have positive feedback effects, particularly generated by diaspora business and knowledge networks.

**Education and training**
The literature covers the education and skills of migrants compared with non-migrants (e.g. Antecol et al, 2003 and Hunt, 2004), and whether migrants’ education and skills are being fully utilised in the labour market or whether they are over-educated in their occupations (Green et al, 2007, Neilson, 2009 and Chiswick, 2009). Much of the literature suggests that over-education is widespread. Parasnis et al (2008) show that there is no evidence that Australian qualifications result in better labour market outcomes for migrants.

A few examples of research into second generation effects of migration are included (e.g. Lüdemann and Schwerdt (2013)).

**Innovation, and research and development**
Jensen (2013) reviews international literature on the relationship between migration and innovation (which mostly show a positive relationship between the two), setting out individual-level evidence, firm-level evidence and university evidence.


At the firm level, Maré et al (2012) combine firm-level innovation data with area-level Census data to examine the relationship between local workforce characteristics (especially the presence of immigrants and local skills) and the likelihood of innovation by firms.

Jensen (2013), drawing on the new international analysis, suggests a number of ideas for improving the evidence base in Australia, including using the Settlement Database matched to other administrative datasets containing information on innovation or entrepreneurial outcomes.

**Barriers to integration**
A number of studies look at barriers to integration and its economic impact. Junakar et al (2004) ask whether Asian migrants are discriminated against in the Australian labour market concluding there are significant ‘unexplained differences’ in the probability of men being unemployed which may be ascribed to ‘discrimination’.

Ratna et al (2012) investigate the economic impacts of social diversity and consequent barriers of communication in Canada and the US. Grafton et al (2007) model and test the effects of social barriers to communication on productivity and capital accumulation to help explain the large
differences in cross country productivity performance, showing linguistic barriers reduce productivity and capital accumulation.

**Policy evaluation and debate**

The final section of the bibliography includes papers which explore the impact of relevant immigration policies, and how immigration policies might be reformed to enhance the economic impact of immigration.

As discussed earlier, a number of studies try to disentangle the effects of ‘self-selection’ from ‘state/government selection’ (e.g. Cully, 2011) to help assess the impact of immigration policies. Cully’s analysis shows that, in the Australian context, migration selection policies do ‘work’ in delivering better labour market outcomes than would accrue if migrants were chosen at random.

Sinning and Stillman (2012) use comparable census data in Australia and New Zealand and, given the existence of the trans-Tasman travel agreement, are able to examine how individuals respond to different labour market conditions (and local amenities and cost of living) of the two countries, and their subregions.


**C.2 Productivity**

The papers in this section set out some of the broad challenges to defining, measuring and influencing productivity.


This speech briefly examines Australia’s economic context and recent trends in productivity, outlines a simple framework for thinking about productivity and policy, explores some of the competing explanations for recent trends in Australian productivity and discusses innovation, skills and productivity. Given at the launch of the Dept of Industry, Innovation, Science, Research and Tertiary Education paper *Demystifying Productivity: A Foundation for Policy Debate*.


While the basic idea of productivity is simple enough, the difficulties in its measurement and identifying the causes behind measured productivity give rise to a wide range of alternative
perspectives and interpretations. Compounding this situation is limited data availability and a scarcity of evidence generally. As a result, there seems to be a divergence of views about what, if anything, should be done on the policy front about the recent slowing of Australia’s measured productivity growth.

This paper aims to contribute to the productivity debate by describing the basic concepts that underpin productivity and its measurement, with a view of making them more easily accessible to policy makers and the interested public. The authors offer their understanding of what productivity is, how it is measured and what the key policy considerations are. In doing so, they address the following questions:

• What is productivity and why is it important?
• Why productivity isn’t everything
• How is productivity measured?
• What determines productivity growth?
• What role do policy, institutions and social factors play?
• What is the nature of the current policy debate around productivity?

Productivity Commission (2009), Submission to the House of Representatives Standing Committee on Economics: Inquiry into Raising the Level of Productivity Growth in Australia, September.

Key points

• Australia’s rate of productivity growth will be a major determinant of future income growth, and of how well the country recovers from the global financial crisis and meets longer term challenges such as population ageing and climate change.

• The determinants of productivity growth operate at two broad levels:
  – immediate causes which, at the individual firm level, include innovation, the adoption or adaptation of technological and organisational advances and the achievement of economies of scale and scope
  – underlying drivers such as competition policy and an open economy, and more fundamental institutional arrangements.

• Over the last four decades, Australia’s market sector multifactor productivity (MFP) growth has averaged 1.1 per cent per year. This places us in about the middle of the OECD rankings over the long term.

• Concerns about declining productivity growth and per capita income growth in the early 1980s gave impetus to the significant economic reforms which were implemented from the mid-1980s.

  – Subsequently, during the 1993-94 to 1998-99 productivity cycle, average annual MFP growth surged to 2.3 per cent. Australia’s productivity performance rose to 2nd among key OECD countries at this time.
The fact that MFP growth has declined since 1998-99 is not unexpected, but the extent of the decline is, especially since 2003-04.

Commission analysis suggests that 70 per cent of the recent rapid decline since the cycle ending in 2003-04 is accounted for by specific developments in 3 sectors:

- Mining, with declining resource quality and large capital investment that has not yet translated into output; Electricity, gas & water, with capital investment and reduced rainfall; and Agriculture, with the drought.

Though important in the long run, factors which are unlikely to have played an immediate and direct role in the recent decline are expenditure on infrastructure, education and training, or R&D.

To raise the rate of productivity growth, a broad based reform programme is required which:

- removes impediments to the efficient allocation of resources across the economy
- heightens the incentives for firms to perform, while helping to enhance their organisational flexibility and capability.

The National Reform Agenda provides an appropriate framework. While recognising the constrained fiscal environment in the short term, policy settings should be based on a commitment to an open and competitive economy, ongoing regulatory reform and efficient investment in human and physical capital.


Productivity Commission 2008, Annual Report 2007-08, Annual Report Series, Productivity Commission, Canberra, Enhancing Australia’s productivity growth (Chapter 1)

Productivity growth is important to Australia because, through income growth, it contributes to our community wellbeing. While capital accumulation and increasing labour force participation also increase per capita income growth, productivity growth is the only way of growing the economy without necessarily requiring additional physical inputs.

In this context, what can we learn from the recent slowdown in Australian productivity growth from its 1990s peaks? Have the reform impacts that enhanced earlier productivity growth run their course? Are there lessons for policy that could boost future productivity growth?

A little over half of the decline in productivity growth below long-term average rates this decade has arisen from developments in agriculture and mining — notably drought and the export boom. There are good reasons for expecting productivity growth in these sectors to improve, but sustained aggregate productivity growth recovery will not be automatic, and attaining above-average growth will require improved performance in several key areas.
Innovation and diffusion of new and better production methods, and the introduction of new goods and services, are the core drivers of productivity growth — getting more, and more highly valued, outputs from any level of inputs.

International evidence suggests that it is market competition, rather than government assistance, that is the main driver of innovation and its diffusion throughout the economy. But innovation and productivity growth also depend on having flexible regulatory settings, capable people and efficient infrastructure, for each of which government plays an important role. Further reforms in these areas could yield significant benefits.

http://www.pc.gov.au/about/accountability-and-reporting/annual-reports/annualreport0708 (Chapter 1)

C.3 Migration, the economy and productivity

This section includes papers which consider a range of factors that explain how migration can affect the economy and productivity. (These factors are looked at in more detail in the following sections.)

It includes:

- the Productivity Commission’s 2006 Inquiry (PC, 2006) into the Economic Impacts of Migration and Population Growth and modelling which informed the PC’s work (Econtec, 2006 and Giesecke & Meagher, 2006))
- a Productivity Commission research paper (PC, 2010) looking at data on population and migration, and considering the economic effects of migration.
- a critique of how migration is considered in the Australian Government’s Intergenerational Reports (Cully, 2012) and a proposal for a dynamic life cycle accounting approach
- an overview of economic aspects of immigration in Australia (Withers, 2003)
- analysis of the impact of migration on Australia’s labour force participation rate (Cully, 2011)
- consideration of the economic contribution of humanitarian settlers in Australia (Hugo, 2014)
- examination of the impact of migration on both the vertical and horizontal distribution of income across Australia and the United States (Garnaut, 2002)
- analysis of the economic benefits to natives in the United States from immigration (Borjas, 1995)
- a comparison of the economic performance of migrants across Europe (Büchel and Frick, 2005)
- an analysis of the longer-term connection between migration and productivity in the UK, and the impact of migration on the UK economy, labour markets and workplaces (Rolfe et al, 2013)
- an overview of the extent and effects of high-skill migration to the EU 27 (Huber et al, 2010)
- an examination of differences in labour market participation and unemployment between immigrant groups in 18 Western countries (Van Tubergen et al, 2004), exploring ‘origin effects’, ‘destination effects’ and ‘community effects’
- an analysis of the direct economic consequences at a sectoral level in Spain and the UK (Kangasniemi et al, 2012)
a discussion of theoretical and empirical research on immigration’s impact on host country wages, employment and growth (Friedberg & Hunt, 1995), including empirical analysis from the US
Terms of reference

The Productivity Commission is requested to undertake a research study examining the impact of population growth, including migration, on Australia’s productivity growth. Productivity growth is a major driver of improvements in real per capita living standards, so there is value in identifying the ways in which population growth and the human capital aspects of migration can affect productivity.

In undertaking the study the Commission is to:
1. report on the nature of international migration flows over the last decade and the extent to which Australia has participated in them, in particular, flows of skilled migrants
2. examine the impacts on skill levels in the Australian population generally, as well as within different industries and occupations, of skilled and unskilled migration
3. assess the relationship between migration, its different permanent and temporary categories, population growth, population and workforce diversity and productivity in Australia, its States and Territories and regions (where possible) and assess likely future developments, quantifying impacts where possible and drawing on the experience of other OECD countries
4. identify the mechanisms through which the impacts of migration and population growth on productivity are transmitted
5. report on any legislative or other impediments which prevent Australia realising the potential productivity gains from migration and from effective use of Australia’s population and workforce diversity, and
6. consider the impact of migration and population growth on labour force participation and economic growth more broadly.

Key points
• Migration has been an important influence on Australian society and the economy affecting the size, composition and geographic location of the population and workforce.
• Recent changes to Australia’s migration programme include a greater emphasis on skills, increased numbers of temporary immigrants, and more diversification in the country of origin.
• The number of Australians leaving this country, permanently and long term, has risen markedly in recent years. But the number has been considerably smaller than those coming to Australia.
• Economic effects of migration arise from demographic and labour market differences between migrants and the Australian-born population, and from migration-induced changes to population growth.
• However, the Commission considers it unlikely that migration will have a substantial impact on income per capita and productivity because:
  • the annual flow of migrants is small relative to the stock of workers and population
  • migrants are not very different in relevant respects from the Australian-born population and, over time, the differences become smaller.
• Some effects of migration are more amenable to measurement and estimation than others. Effects that cannot be reliably measured or estimated might still be significant.
  • Positive effects from additional skilled migrants arise from higher participation rates, slightly higher hours worked per worker and the up-skilling of the workforce.
  • Some of the economy-wide consequences lower per capita income, such as capital dilution and a decline in the terms of trade.
  • The overall economic effect of migration appears to be positive but small, consistent with previous Australian and overseas studies.
• In terms of the selection criteria of the Migration Programme:
  • The greater emphasis on skills has been associated with better labour market outcomes for immigrants
  • English language proficiency stands out as a key factor determining the ease of settlement and labour market success of immigrants.

Modelling the Economic Impacts of Migration and Population Growth [Section 3 p31] Linking migration, population and productivity

**Key points**

• The key drivers of the economic effects of migration are:
  o the level of migration relative to the size of the population
  o the differences between migrants and the existing resident population
  The main sources of differences include gender, age, level of education, field of qualification, country of origin, English language proficiency, work experience, wealth and geographical region of initial settlement.
• The characteristics of migrants are influenced by:
  o the entry conditions for each visa category (Skilled, Family and Humanitarian)
  o the self-selection and motivation of migrants entering under each visa category.
• Migration and population size influence productivity and income per capita through a number of channels including:
  o changes to the supply of labour, including its size and skill composition
  o changes to macroeconomic variables, such as investment, capital stock, and the terms of trade
  o changes to the sectoral structure of the economy
  o the potential for economies of scale and increased competition in the domestic economy
  o the endowment of natural resources and potential for environmental externalities
  o the effects on the government sector, including government revenues, transfer payments and other expenditures
  o the effects on trade and the transfer of technology.

The overall impact depends on the sum of the contributions of these influences, some of which are positive and others negative, and is essentially an empirical matter.


While a larger population leads to a larger economy, the main issue is whether this expansion is accompanied by higher living standards. According to the PCPP, living standards, as measured by Gross National Product (GNP) per capita, are lower than would otherwise be the case for the first 12 years of the policy, but are then higher. After 20 years, the gain in GNP per capita reaches 0.6 per cent.

The economic effects obtained using the Migration Modelling Framework are materially more favourable than those found in the PCPP. In particular, the initial drop in living standards is milder and less protracted, and after 20 years the gain in living standards reaches 1.1 per cent, compared with the PCPP estimate of 0.6 per cent. This is a material difference for assessing the economic merits of the skilled migration programme. Like the PCPP Modelling Framework, Econtech’s Migration Modelling Framework finds a minimal impact of skilled migration on the unemployment rate.

Both modelling approaches find minimal effects on unemployment but for different reasons. Further, neither modelling approach takes into account that by some targeting of skills in short supply, the extra skilled migration intake is likely to reduce jobs mismatch, leading to some long-term reduction in unemployment. It is therefore likely that they understate the benefits from increased skilled migration.


Key points:

• Since the 1980s, net overseas migration has overtaken natural increase as the major contributor to Australia’s population growth.

• Although the total fertility rate in Australia has risen recently, it is still only half what it was in the early 1960s.

• Over the past century, life expectancy has increased significantly. This has mitigated the decline in natural increase and been the main contributor to the ageing of Australia’s population.

• Migration flows are shaped by the economic and social motivations of migrants and by government policy in Australia.
  – Only the permanent migrant intake is controlled directly by the government, but migration is also influenced indirectly through other policy settings and conditions.

• Net overseas migration has grown strongly during the past ten years, with most of the growth being in the ‘temporary’ categories.
  – Temporary migration contributes to Australia’s population growth in the long term as well as short term. In the last five years, many overseas students and skilled temporary migrant workers obtained permanent residence onshore.
• The Humanitarian Programme is a small component of the total migrant intake. Refugee visas granted to unauthorised arrivals do not increase its size.
• Australia’s population is highly urbanised. In recent years, population growth in capital cities has exceeded growth in most other parts of the country.
• Future population levels are sensitive to even minor variations in the components of population change and cannot be predicted with accuracy.
• The economic effects of immigration and population growth are diverse, depending on source, composition and context.


In March 2005, the Productivity Commission released a report on the Economic Implications of an Ageing Australia. The report describes projections for a number of economic variables including population, labour force participation rates, labour supply, employment, and hours worked per week. The present report describes two simulations with the MONASH model designed to extend the range of the Commission’s earlier analysis. The first (Simulation A) is a base case forecast for the Australian economy for the twenty-year period 2004-05 to 2024-25. As far as possible, it is specified so as to maintain consistency with the Commission’s projections. The second (Simulation B) is an alternative forecast for the same period in which the intake of skilled migrants is assumed to be higher.

The primary purpose of the report is to identify how the labour market might absorb the increase in the number of migrants. To that end, employment by skill group is treated as exogenous in the simulations and the model determines the distribution of employment across industries and occupations. This emphasis is timely given widespread current concerns about skill shortages in Australia and the concomitant proposals to alleviate the perceived shortages via immigration. The study represents a clear addition to the range of existing quantitative assessments of the economic impact of migration. However, it abstracts from a number of issues that have been canvassed in other places, including economies of scale, congestion and environmental externalities, fiscal transfers between incumbents and new arrivals, the extent of foreign ownership of the capital stock and immigration induced changes in technology and consumer tastes.


In the conceptual framework of the Intergenerational Reports, immigration features as an exogenous input into the size of the population and its composition by age and sex. There are good reasons for believing that immigration has sizeable endogenous components, that attributes other than age and sex distinguish immigrants from the native-born, as well as
from each other, and that these features are of significant economic and fiscal import. Last, it is suggested that, in the context of an ageing population, we may learn much about the effectiveness of different policy responses in achieving fiscal sustainability—as well as immigration policy—through a dynamic life cycle accounting approach.


This paper characterises the major economic dimensions of Australian research into economic aspects of immigration. This covers macro-economics (labour markets, current account, and government budgets), long-run growth (productivity, real income) and social economics (distribution of income and wealth, discrimination) and discussed the major gaps remaining for informing Australian policy (ageing, environment, regional distribution). It speculates on the likely influence of research on future policy and on lessons from Australia for Europe and vice versa.


Between 2000 and 2010, the labour force participation rate in Australia increased by more than 2 percentage points to reach a record high by the end of the decade. This is remarkable as mainstream forecasters had been projecting a fall. This paper decomposes the change in the participation rate to examine the separate contributions of age, gender and birthplace. There are three strong findings. First, among the Australian-born, increases in the propensity to participate in the labour force among women and older persons fully offsets the downward pull of ageing. Second, among the overseas-born, there is both a reverse-ageing effect—reflecting the large influx of young migrants over the past decade—and the same higher propensity to participate among women and older persons. The end result is that migrants added 1.9 percentage points to the aggregate participation rate over the past decade. Third, controlling for age and gender, participation rates for the overseas-born remain lower than they are for the Australian-born. There has been some convergence over the decade for men, but not for women.


This article assesses the economic role of refugee settlers in Australia. Refugee-humanitarian labour force participation rates are lower than for other migrant groups or the Australia-born. However, their labour market performance converges toward that of the Australia-born over time. Moreover, the second generation performs at a higher level. There are a number of significant impediments to participation including language, education, structural disadvantage and discrimination. Indeed, there is evidence of a significant refugee gap which
can only be explained by discrimination. It is shown that refugees represent a significant stock of human capital that is not being fully realized. They suffer more than other groups through non-recognition and there is substantial “brain waste” with negative results for the economy and the migrants themselves. Finally, it is shown that refugee-humanitarian settlers show greater propensity to form their own business than other migrants and that risk-taking, entrepreneurialism and an ability to identify and take advantage of opportunities is a key characteristic of the group.


Immigration affects income distribution in Australia through several mechanisms. The effects depend on the age and gender composition of the immigrants as well as on the total level of immigration.

In a country of Australia’s population size and density, in Australia’s geo-strategic location, if immigrants were of similar average age and skills to the native population, substantial net immigration would be likely to be associated with higher per capita incomes and living standards. This is because of economies of scale in the provision of various public goods (including defence, assistance to neighbouring developing states, overhead costs of government), and economies of scale in transport, communications and various non-traded services and goods.

Any policy which raises average incomes provides the potential for more equitable vertical income distribution in Australia as a whole through two mechanisms:

• expanded public fiscal capacity to support transfers to and services for low-income Australians;
• reducing unemployment, by raising productivity relative to fixed, regulated minimum wages.

Immigration could have an even greater positive effect on income distribution if it led to a higher ratio of work-age to dependent population, and if the average skill level of immigrant were higher than in the established population.

The paper examines the level and composition of Australian immigration with these considerations in mind. It examines trends over time in the likely impact of immigration on income distribution. It examines the potential for changing Australian income distribution by variation in the level and composition of immigration.

The paper compares the relationship between immigration and income distribution in Australia and the United States.

In addition to discussing effects on vertical income distribution, the paper discusses the effects of immigration on the “horizontal” distribution of income across Australian states and regions. It focuses on ultimate distributional effects, allowing for the fact that the
concentration of immigrant settlement in some locations (notably the big cities) tends to raise costs in those locations, and promote migration of native Australians to other parts of Australia.


This paper uses a simple economic framework to describe how natives benefit from immigration, provides a back-of-the-envelope calculation of these benefits, and suggests the parameters of an immigration policy that would maximize the economic benefits. The discussion indicates that natives do benefit from immigration mainly because of production complementarities between immigrant workers and other factors of production, and that these benefits are larger when immigrants are sufficiently "different" from the stock of native productive inputs. The available evidence suggests that the economic benefits from immigration are relatively small, on the order of $7 billion, and almost certainly less than $25 billion, annually. The discussion also indicates, however, that these gains could be increased considerably if the United States pursued an immigration policy that attracted a more skilled immigrant flow.

The analysis discusses the impact of immigration on a host country within a competitive, market-clearing framework. In this context, as long as there are no externalities, an application of the fundamental theorems of welfare economics and the principles of free trade suggests that allowing factors of production to move from one country to another increases total welfare and efficiency. Because of the potential implications of the results, however, it is important to point out at the outset that the discussion ignores some very important issues. For example, by focusing on the economic benefits accruing to natives residing in the host country, the study ignores the impact of immigration both on the immigrants themselves and on the persons who remain in the source countries. Similarly, by focusing on a competitive economy with market-clearing and full employment, the analysis ignores the potentially harmful effects of immigration when there is structural unemployment in the host economy, and jobs might be a "prize" that are captured partly by immigrants.


Drawing on panel data from the European Community Household Panel (ECHP), the British Household Panel Survey (BHPS) and the German Socio-Economic Panel Study (SOEP), we compare the economic performance of immigrants to Great Britain, West Germany, Denmark, Luxembourg, Ireland, Italy, Spain and Austria to that of the respective indigenous population. The unit of analysis is the individual in the household context. This allows us to define immigrants’ state of integration into the host society at the family level taking into account issues such as immigrant/native intermarriage.
Economic performance is measured in terms of the country-specific pre-government income position and change in the relative income position due to redistribution processes within the respective tax and social security systems. Our work is based on the premise that countries may be categorized – similarly to existing categorizations based on the type of welfare regime – according to the nature of their immigration policy. From an economic point of view, a successful and integrative immigration policy should result – at least when controlling for background characteristics such as education – in a non-significant differential between the economic performance of immigrants and that of the indigenous population. At first glance, our results indicate that this “ideal” is not attained in all of the countries analysed, particularly not in Germany and Denmark, where the economic performance of immigrants is much lower than that of the indigenous population. However, results from GLS random-effects models show that immigrants to these countries improve their economic situation rapidly with increasing duration of stay in the host country. This implies that these countries also do fairly well in fostering in the economic integration of immigrants. The empirical results further reveal that the substantial cross-country differences in the immigrant/native-born performance differential persist even when controlling in detail for socioeconomic characteristics of the household and for indicators of the state of the immigrants’ integration, such as years since migration and immigrant/native intermarriage.

This suggests that not only the conditions of entry to a country impact on immigrants’ economic performance, but also country-specific institutional aspects such as restrictions on access to the labour market and parts of the social security system that are related to citizenship or immigrant status. There still is a great deal of heterogeneity across EU member states in this respect. This should be taken into account when working towards the harmonization of national EU immigration policies.


Immigration is a contentious issue in the industrialized nations of the world. This is true not merely in traditional receiving countries, such as the United States, Canada and Australia, but in recent decades also in Europe, which historically experienced net emigration.

Many of the key issues in the debate on immigration policy are economic. Most attention has been paid to the potential adverse effect on the labor market outcomes of native-born workers: immigrants may compete with native-born workers in the labor market, displacing them in employment or bidding down wages. Less attention has been devoted to the possible benefits of immigration. Immigrants may complement some native factors in production, which would lead to these factors benefiting from immigration, and overall welfare may rise. Another question less commonly asked is how immigration influences growth in per capita income.
Until recently, little detailed empirical work has been done on the impact of immigrants on the receiving economy. This paper discusses the recent theoretical and empirical research on immigration's impact on the income growth and labor market outcomes of natives.


The report focuses on the long-term connection between migration and productivity. It uses quantitative and qualitative methods to look at:

- existing evidence, what it tells us about migration and productivity and what it does not;
- practices, experiences and perspectives of employers and then at the perspectives of employees who work with migrants drawn from the general public;
- whether the benefits identified by employers and by employees are reflected in data on productivity.

The findings highlight the advantages to some organisations of recruiting internationally, in terms of productivity and competitiveness. The evidence from the case studies and from the focus groups is that they do this through bringing additional, complementary skills to workplaces and work teams. The disadvantages are also conveyed through case study evidence.

This paper includes a review of existing literature. Existing studies have found immigration has impacts on firms through a number of processes, including through complementarity of skills, aptitudes and knowledge between migrants and natives, which raises the overall skill level of workplaces and firms; transmission of skills, aptitudes and knowledge from migrants to non-migrant colleagues and by increasing the incentive for natives to acquire certain skills by boosting competition. Evidence also points to productivity impacts made by migrants in bringing knowledge of markets and economies of home countries and connections with these. The contribution of migrants to innovation and business growth has been evidenced by the involvement of migrants in research in patent applications. Productivity gains have also been found to result from diverse teams.


The literature on international migration has repeatedly emphasized that the extent and structure of migration has an important impact on the competitiveness of regions and countries. This report provides an overview of the extent and the potential effects of high-skill migration to the EU27. It shows how many high-skilled migrants live in the EU, where these migrants come from, and how the European Union is positioned in the international competition for talent. Second, the paper examines how high-skilled migrants fare in European labour markets. Finally it addresses the issue of the effects of high-skill migration on multifactor productivity, gross value added and GDP per capita growth as well as patenting activities at the sectoral and regional levels. The analysis finds that - despite substantial heterogeneity among individual EU countries - high-skilled foreign-born are an
important source for high-skilled labour in the EU27. There was some evidence that - on average - EU OECD economies (EU) had a lower share of highly qualified migrants than the (arithmetic) average of the (high migration) non-EU OECD economies. However, our results also suggest that this increasing selectivity of immigration regimes is countered by a relatively low qualification structure of short-term migrants in the EU. A second important policy-relevant finding of this study is that high-skilled migrants in the EU face a number of challenges when entering the European labour market, that make them distinct from other migrant groups such as less skilled migrants. In particular the high-skilled migrants - in contrast to less skilled migrants - have lower labour market participation rates, higher unemployment rates and lower employment rates than comparable natives and face substantially higher risks of being employed in jobs that do not fit their skill structure. Our analysis regarding the impact of migration and of high-skilled migration in particular on sectoral productivity and gross value added (levels and growth) yielded a number of interesting results though still being preliminary. Particularly interesting was the difference of the impact of the share of migrants in levels and growth specifications, as well as the importance of a break-down by different groups of migrants (from EU and RoW). There was also a relatively robust result of a positive impact of the share of high-skill migrants and of an interactive effect of high-skill migrant share and ICT technology. As regards the analysis of migrants and regional growth and regional technological development (proxied by patents per capita) we found a positive relationship between the share of high-skilled employed persons and of high-skilled migrants and the growth rate of regional GDP per capita.


This article examines differences in labor market participation and unemployment between immigrant groups in different countries. The authors argue that two macro designs must be combined to provide a more comprehensive perspective on the economic integration of immigrant groups. Instead of reliance on observations of multiple-origin groups in a single destination or a single-origin group in multiple destinations, multiple origins in multiple destinations are compared, suggesting that the economic status of immigrants may be affected by the country from which they come (“origin effect”), the country to which they migrate (“destination effect”), and the specific relations between origins and destinations (“community effect”). From the human capital theory, compositional hypotheses are derived, which predict that these macro effects can be attributed to the selection of human capital. From discrimination theories, contextual hypotheses are deduced, which maintain that macro effects can be ascribed to in-group preferences and out-group prejudices. Data on immigrants’ labor force activity and employment in 18 Western countries during the period 1980 to 2001 are reported. Using multilevel techniques, the analysis shows that compositional differences associated with political suppression in the countries of origin, relative income inequality, and geographic distance affect the labor force status of immigrants. Contextual effects play a role as well in terms of religious origin, the presence of left wing parties in the government, and the size of the immigrant community.

Over the past 20 years labour has become increasingly mobile and whilst employment and earnings effects in host countries have been extensively analysed, the implications for firm and industry performance have received far less attention. This paper explores the direct economic consequences of immigration on host nations’ productivity performance at a sectoral level in two very different European countries, Spain and the UK. Whilst the UK has traditionally seen substantial immigration, for Spain the phenomenon is much more recent. Our findings from a growth accounting analysis show that migration has made a negative contribution to labour productivity growth in Spain and a negative but negligible contribution in the UK. This difference is driven by a positive impact from migrant labour quality in the UK. This finding broadly holds across all sectors, but the authors note considerable variation in magnitudes. Labour productivity growth has a neutral contribution from migrant labour in construction and personal services in the UK, whilst in every case in Spain the effect is negative, most strongly in agriculture. Using an econometric approach to production function estimation, the authors observe a positive long term effect on total factor productivity from migrant workers in the UK and a negative effect in Spain. The findings suggest that either the UK is better at assimilating migrants or is more selective in terms of who is permitted to migrate.

### C.4 Wages and labour market outcomes

This section covers wages and employment outcomes for migrants and natives, including the process of migrants’ adaption to the labour market. It includes:

- a comparison of alternative methods for estimating immigrant wage and employment assimilation (Cobb-Clark et al, 2012)
- an analysis of unobserved heterogeneity on the immigrant wage gap and assimilation in Australia (Breunig et al, 2013)
- an analysis of the potential role of immigrant selection criteria, labour market conditions and income-support policy in facilitating the labour market adjustment of new arrivals to Australia (Cobb-Clark, 2003)
- an analysis of the two-step Australian immigration policy and its impact on immigrant employment outcomes (Gregory, 2014)
- an assessment of the role of selection criteria in the immigrant settlement process in Australia (Cobb-Clark, 2000)
- an investigation of the impact of the relative growth of skilled migration on the structure of Australian wages (Islam & Fausten, 2008)
- an investigation of the impact of immigration on earnings of native Australians using micro-data (Addison & Worswick, 2002)
- a comparative analysis of adult male immigrant earnings and unemployment in the US and Australia (Miller et al, 2003)
• a longitudinal analysis using Social Security earnings records to study the earnings progress of U.S. immigrants (Lubotsky, 2000)
• empirical evidence for Spain on the effect of immigration on labour productivity (Nicodemo, 2013)
• analysis of immigration selection and short-term labour market outcomes by visa category in Canada (Aydemir, 2011)
• analysis of labour market transitions of immigrants in Denmark (Blume et al, 2009)
• a re-examination of the impact of immigration on the labour market in the United States (Borjas, 2003)
• a review of academic literature of the impact of immigration on American workers (Borjas, 2013)
• analysis of state level data in the US to assess impact of immigrants on the economy’s productive capacity (Peri et al, 2014)
• an examination of earnings disparities between immigrants and native-born Canadians (Li, 2000)
• analysis of economic performance (employment rates, hourly wages, annual income and occupations) of immigrants in New Zealand compared to NZ-born (Stillman et al, 2009)


This paper compares alternative methods for estimating immigrant wage and employment assimilation using unique panel data over 2001–09 for a large, nationally-representative sample of immigrants. Previous assimilation estimates have been mainly based on cross-sectional data and have therefore suffered from a range of potential biases. The paper finds that a fixed-effects model generates estimated employment assimilation profiles that are flatter and significantly different to those produced by cross-sectional and synthetic cohort methods. However, there are no significant differences in the wage assimilation profiles across alternative methods.


Immigrants to Australia are selected on observable characteristics. They may also differ from natives on unobservable characteristics such as ambition or motivation. If unobservable differences are accounted for, a wage gap for immigrant men from English speaking backgrounds is found, in contrast with previous research which has found no wage gap. Controlling for unobserved heterogeneity also seems important for finding cohort effects. Immigrants that arrived before 1985 faced a larger wage gap compared to native-born Australians than subsequent cohorts. Confirming other research, the paper finds wage gaps for immigrant men and women from non-English speaking backgrounds. Wage assimilation occurs slowly for all groups, but is slowest for those from non-English speaking backgrounds.

Two separate cohorts of immigrants to Australia are compared in order to assess the potential role of immigrant selection criteria, labor market conditions, and income-support policy in facilitating the labor market adjustment of new arrivals. Although these two cohorts entered Australia only five years apart, their initial labor market outcomes varied dramatically. The results indicate that changes in immigration policy may have led to increased human capital endowments that in turn resulted in higher participation rates and reduced unemployment. At the same time, improvement in Australian labor market conditions and changes in income-support policy over the 1990s – which most likely altered the returns to human capital – were probably instrumental in reinforcing the effects of tighter immigrant selection criteria. As much as half of the fall in unemployment rates among women and one third the decline among men appears to have occurred as the result of changes in the returns to demographic and human capital characteristics.


Three decades ago most immigrants to Australia with work entitlements came as permanent settlers. Today the annual allocation of temporary visas, with work entitlements, outnumbers permanent settler visas by a ratio of three to one. The new environment, with so many temporary visa holders, has led to a two-step immigration policy whereby an increasing proportion of immigrants come first as a temporary immigrant, to work or study, and then seek to move to permanent status. Around one half of permanent visas are allocated onshore to those who hold temporary visas with work rights. The labour market implications of this new two-step system are substantial. Immigrants from non-English speaking countries (NES), are affected most. In their early years in Australia, they have substantially reduced full-time employment and substantially increased part-time employment, usually while attending an education institution. Three years after arrival one third of NES immigrants are now employed part-time which, rather than unemployment, is becoming their principal pathway to full-time labour market integration. Surprisingly, little has changed for immigrants from English speaking countries (ES).


This paper assesses the role of selection criteria in the immigrant settlement process. Do skill-based immigrants have higher participation and employment rates than family-based immigrants? Does this represent a head start or a persistent labour market advantage? The Longitudinal Survey of Immigrants to Australia is used to address these questions. Generally, migrants selected for their skills have better labour market outcomes. Over time, the relative gap in participation rates increases, while the gap in employment rates decreases. Net of visa category, outcomes are better for native English speakers and for those who visited Australia prior to migration.

This paper investigates the impact of the relative growth of skilled migration on the structure of Australian wages. Unlike conventional approaches, the present study uses macro data to examine the response of wages to immigration flows. We use instrumental variable techniques to control for the potential endogeneity of immigration. The results, using alternative estimation strategies, are consistent with the dominant findings from existing empirical work. There is no robust evidence that a relative increase in skilled immigrants exerts any discernible adverse consequences on the wage structure in Australia.


The present paper provides a new approach to investigate the impact of recent immigrants on the real wages of native Australians. The method involves cross-section analysis of 48 labour markets using data from six consecutive Australian Bureau of Statistics (ABS) income distribution surveys for the years 1982 through 1996. Recent immigrants are not found to significantly affect the real wages of native Australians. This conclusion remains unchanged when the specific impact of immigration on less educated or young Australian workers is investigated.


A comparative analysis of adult male immigrant earnings and unemployment in the US and Australia using a measure of expected earnings shows that immigrants in the US perform relatively well, and the pattern of the differences between immigrant adjustment in the US and Australia appears to have links to differences in methods of pay determination. The results suggest an advantage to a more flexible labour market. A simulation exercise demonstrates the sensitivity of the findings to cohort effects.

Lubotsky D (2000), Chutes or Ladders? A Longitudinal Analysis of Immigrant Earnings, Labor and Demography 0004006, EconWPA.

This study uses Social Security earnings records matched to recent cross-sections of the SIPP and CPS to study the earnings progress of U.S. immigrants. The data show that immigrants’ earnings grow 10 to 13 per cent during their first twenty years in the U.S. relative to the earnings of natives with similar labor market experience. By comparison, estimates of immigrants’ relative wage growth from cross-sections of the decennial Census are substantially higher. The divergent results reflect the selective outmigration of low-earning immigrants. The longitudinal earnings histories also show that 14 per cent of immigrants have earnings in the U.S. prior to their most recent date of arrival, which points to a significant amount of back-and-forth migration between the U.S. and immigrants’ home countries. The misclassification in previous work of these largely low-wage immigrants as recent arrivals accounts for close to one-third of the measured decline in the level of
earnings of immigrant arrival cohorts between 1960 and 1980. The new evidence presented here, therefore, suggests that previous analyses had overestimated both the rate of earnings growth among immigrants who remain in the U.S. and the secular decline in the level of earnings across arrival cohorts.


The purpose of this paper is to explore the immigration and productivity in Spain. We estimate the effect of immigration on labor productivity from 2004 until 2008 for Spain. Using firms (SABI) and individual data (Social Security Records) we calculate the effect by sector and municipality for the two big Spanish provinces that have received most immigrants in the last decade: Barcelona and Madrid. After controlling for endogeneity of immigration, the results demonstrate that immigration has a negative effect on productivity. Education and occupation are both variables with a positive effect on productivity, while permanent, public or full time contracts do not have any effect. Type of immigration, Europeans 15 (more skill) versus no European, is not relevant in explaining the negative productivity. This fact is due that firms are very heterogeneous across them and use their employees below their real production potential.


This paper studies the efficacy of immigrant selection based on skill requirements in the Canadian context. The point system results in a much higher skill level than would otherwise be achieved by family preferences. This positive selection is achieved by directly selecting higher-skilled principal applicants who are assessed by the point system and also indirectly through higher-skilled spouses. However, due to difficulties in transfer of foreign human capital, immigrants admitted for their skills do not necessarily perform better in the labor market, and important factors used to assess admissibility have very limited power to predict short-term labor market success.


In developed countries, immigrants are more likely to be non-employed and self-employed compared to natives. Based on register data of male immigrants in Denmark, we performed a detailed investigation of the immigrant–native difference in transition patterns across labor market states. The paper finds that a high proportion of immigrants from non-Western countries tend to be marginalized relative to natives, and they tend to use self-employment to escape marginalization.

Immigration is not evenly balanced across groups of workers that have the same education but differ in their work experience, and the nature of the supply imbalance changes over time. This paper develops a new approach for estimating the labor market impact of immigration by exploiting this variation in supply shifts across education-experience groups. The paper assumes that similarly educated workers with different levels of experience participate in a national labor market and are not perfect substitutes. The analysis indicates that immigration lowers the wage of competing workers: a 10 per cent increase in supply reduces wages by 3 to 4 per cent.


At current levels of around one million immigrants per year, immigration makes the U.S. economy (GDP) significantly larger, with almost all of this increase in GDP accruing to the immigrants themselves as a payment for their labor services.

For American workers, immigration is primarily a redistributive policy. Economic theory predicts that immigration will redistribute income by lowering the wages of competing American workers and increasing the wages of complementary American workers as well as profits for business owners and other “users” of immigrant labor. Although the overall net impact on the native-born is small, the loss or gain for particular groups of the population can be substantial.

The best empirical research that tries to examine what has actually happened in the U.S. labor market aligns well with economy theory: An increase in the number of workers leads to lower wages. This report focuses on the labor market impact of immigration.

Immigration also has a fiscal impact — taxes paid by immigrants minus the costs they create for government. The fiscal impact is a separate question from the labor market impact. This report does not address the size of the fiscal impact.


The effects of immigration on the total output and income of the U.S. economy can be studied by comparing output per worker and employment in states that have had large immigrant inflows with data from states that have few new foreign-born workers. Statistical analysis of state-level data shows that immigrants expand the economy’s productive capacity by stimulating investment and promoting specialization. This produces efficiency gains and boosts income per worker. At the same time, evidence is scant that immigrants diminish the employment opportunities of U.S.-born workers.


The economic contribution of immigrants is often measured by their earnings in that the closer they are to the earnings of native-born Canadians and the more quickly immigrants
can bridge the income gap, the more immigrants are assumed to be endowed with human capital. Using micro-data of the 1996 Census, this paper compares immigrant groups with native-born Canadians of the same gender and racial origin at four levels of Census Metropolitan Area defined by population size. The findings indicate that immigrants of the same gender and racial origin earned either the same or more than their native-born counterparts. However, when variations in human capital, experience, and other individual differences in work-related characteristics and immigrant experience are taken into account, along with differences in urban scale, immigrant population size and unemployment rate, all immigrant groups earned less than their native born counterparts. The magnitude of net earning disparities between immigrants and native-born Canadians varies, depending on gender, racial origin and less so on CMA level. The study suggests that many factors, including unequal opportunities, affect the earnings of immigrants, and that the assumption of immigrants’ inferior human capital content inferred from earning disparities is tenuous at best.

Stillman, Steven and Maré, David C. (2009) The Labour Market Adjustment of Immigrants in New Zealand, Motu Working Paper 09-10, Wellington: Motu Economic and Public Policy Research. This paper uses data from the 1997–2007 New Zealand Income Survey to examine the economic performance of immigrants in New Zealand. Specifically, the authors use a synthetic cohort approach to examine how employment rates, hourly wages, annual income and occupations for immigrants compare with those for the NZ-born. The paper estimates the time pattern of adaptation in a semi-parametric manner for immigrants from different birth regions and with different qualifications. The paper also examines the possible impact of immigrants getting different returns from qualifications. The pattern of entry disadvantage followed by subsequent relative improvement is more pronounced for employment rates than for wage rates or occupational rank. It is also more pronounced for immigrants born in Asia. Outcomes for immigrants from the Pacific Islands never catch up with the NZ-born.

**C.5 Savings and investment**

This section includes papers explaining the wealth gap between immigrants and native born. (Immigrants might attract investment from abroad through links back to their home country. Connectedness is covered in the next section.) It includes:

- a comparative analysis of the relative wealth position of immigrants residing in Australia, Germany and the United States (Bauer et al, 2011)
- a study exploring the disparity in wealth between native-born and foreign-born households in Australia (Doiron and Guttman, 2009)
- similar studies in New Zealand (Gibson et al, 2007) and the United States (Cobb-Clark and Hildebrand, 2006)
- a study examining relative wealth position and portfolio choices in Germany (Sinning, 2007)

We investigate the relative wealth position of immigrant households residing in Australia, Germany, and the United States. In Germany and the United States, wealth differentials stem from differences in the educational attainment and demographic characteristics of the native and immigrant populations, rather than income differentials. In contrast, the small nativity wealth gap in Australia exists because immigrants to Australia do not translate their relative educational and demographic advantage into a wealth advantage. Overall, the paper finds substantial disparity in the economic well-being of immigrant and native families which is largely consistent with domestic labour markets and immigration policies.


Wealth is an important measure of overall economic well-being and a crucial factor in migrants’ ability to integrate into their new country. Using data from the 2002 HILDA survey, this study explores the disparity between the wealth distributions of native-born and foreign-born households in Australia. Using quantile regressions the results reveal that migrants have significantly less wealth than their Australian-born counterparts throughout the wealth distribution. This is despite the greater wealth-generating characteristics of the foreign-born. The wealth differentials are reduced but still negative for the migrant cohorts who have been in Australia for over 25 years.


Immigrants are typically found to have less wealth and hold it in different forms than the native born. These differences may affect both the economic assimilation of immigrants and overall portfolio allocation when immigrants are a large share of the population, as in New Zealand. In this paper, data from the 2001 Household Savings Survey are used to examine wealth differences between immigrants and the New Zealand-born. Differences in the allocation of portfolios between housing and other forms of wealth are described. Unconditional and conditional wealth quantiles are examined using parametric models. Semi-parametric methods are used to decompose differences in net worth at different parts of the wealth distribution into the part due to differences in characteristics and the part due to differences in the returns to characteristics.


SIPP data are used to analyze the wealth of the U.S. foreign-born population. We find that the median wealth level of U.S.-born couples is 2.5 times the median of foreign-born couples, while the median wealth level of U.S.-born singles is three times that of foreign-born singles. Further, there is a great deal of diversity in wealth within the immigrant population. Diversity in net worth manifests itself primarily in source-region differences,
while entry-cohort is more closely related to portfolio choices. Established immigrants hold less and recent immigrants hold more financial wealth. An opposite pattern emerges with respect to real estate equity.


This paper examines the relative wealth position and the portfolio choices of immigrants in Germany. The empirical findings reveal significant differences in overall wealth and various wealth components between German natives and immigrants. Differences in real estate constitute the major part of different levels of net worth, indicating that disparities in homeownership rates are responsible for the main part of the overall wealth gap. Moreover, migrants’ degree of portfolio diversification is significantly lower than that of comparable natives. The results of a decomposition analysis suggest that differences in wealth and asset holdings may be explained by disparity in educational attainment to a sizable extent, while the effects of income differentials and differences in demographic characteristics are insignificant.

C.6 Settlement

This section covers how and where immigrants settle (including agglomeration issues and effects). It includes:
- an analysis of how immigrants assimilate as communities, not just as individuals in Australia (Hatton & Leigh, 2011)
- a review of the Regional Sponsored Migration Scheme (RSMS) and State Specific Regional Migration (SSRM) policy and their impact on attracting and retaining skilled migrants and their families to the Northern Territory (Taylor et al, 2014)
- a DIBP (2014) publication examining regional retention of migrants
- a special issue of the Journal of International Migration and Integration (Wulff et al., 2008) which covers the ‘new paradigm’ in international migration, that is, how regional migration policies are designed to encourage arrivals to choose hinterlands or low-growth centres as their destination and long-term residential location
- an examination of the settlements patterns and geographic mobility of migrants to New Zealand (Maré et al., 2007)
- an investigation of the Danish spatial dispersal policy on refugees (Damn, 2009)


The literature on the economic assimilation of immigrants generally treats them as atomistic individuals assimilating in a largely anonymous labour market. Here, the authors argue that immigrants assimilate as communities, not only as individuals. The longer the immigrant community has been established, the better adjusted it becomes, and the more the host society comes to accept that ethnic group. Using data from a 5 per cent sample of the 1980, 1990 and 2000 US censuses, the authors find that the stronger the tradition of immigration
from a given source region, the better are the economic outcomes for subsequent immigrants from that source.

Taylor A J, Bell L and Gerritsen R (2014), Benefits of Skilled Migration Programmes for Regional Australia: Perspectives from the Northern Territory, *Journal of Economic and Social Policy*

Skilled migration has long been at the forefront of policies for engendering population and regional economic growth in developed nations like Australia. Indeed a rapid growth in the size of the skilled migrant intake during the past thirty years has seen skilled migration visa numbers outstrip the combined permanent intake from other migration streams. The Regional Sponsored Migration Scheme (RSMS) and State Specific Regional Migration (SSRM) schemes have been enacted and progressively altered in order to attract skilled migrants to regional areas of Australia. Nevertheless, population and economic growth are becoming increasingly concentrated into regional hotspots, particularly across the north of the country, raising questions about the efficacy of these programmes to address skill needs in industries outside the resource sector, where a spatially distributed demand for skilled workers is emerging. In light of overall pessimism in existing literature which points to skilled migrant ‘leakages’ from regional Australia to larger cities, this study aims to provide an up-to-date assessment of the contributions of the RSMS and SSMS programmes for attracting and retaining skilled migrants and their families to the Northern Territory of Australia. The authors conducted online surveys with recent migrants to the jurisdiction through a combination of open and closed questions. The results provide positive indications about the demographic, labour force and retention contributions of the programmes with high rates of retention evident overall and demographic contributions including a female-biased migrant cohort and high rates of partnering. From a policy perspective, our findings suggest that skilled migrants are contributing to population stability in the face of high population turnover and an increasing male bias across the north of Australia. Nevertheless, the study reminds regional areas that future growth and sustainability will require concerted and innovative approaches to planning and development as global competition for skilled migrants increases.

DIBP (2014) Regional retention of migrants: critical success factors

This research, which was part of the then Department of Immigration and Citizenship’s 2010-11 Research and Evaluation Programme, investigated the critical success factors that facilitate migrant retention in regional communities. It considers the broader trends that might influence regional settlement patterns, as well as interdisciplinary literature and policy approaches relevant to regional development.

The research draws on research literature and information provided by Australian governments. In particular, it builds on a previously commissioned study of factors that influence skilled migrants locating in regional areas, conducted by the Social Science Unit at the University of Queensland, which has been published on the department’s website. The
previous research also considered the factors relevant to migrants’ decisions to settle and stay in regional Australia, although it focuses on a very small group of skilled migrants in the Northern Territory and some other regional areas.
This Introduction to a special edition of the *Journal of International Migration and Integration* examines what has been termed the ‘new paradigm’ in international migration, that is, regional migration policies designed to encourage new arrivals to choose hinterlands or low-growth centres rather than major cities as their destination and long-term residential location. This edition developed out of research papers prepared for the 12th International Metropolis Conference held in October 2007 in Melbourne, Australia. The Introduction contains short summaries of all the papers included.

Although regionalization has become an explicit component of immigration policy in the three countries, success has not been automatic. There have been many challenges and barriers to the successful attraction and retention of immigrants in the smaller centres. However, some policies and initiatives have made a difference.

A number of new policy and programme initiatives to attract more immigrants to regional areas and smaller centres have been introduced including:

– the points bonus for immigrants who have received employment offers outside major metropolitan centres or are prepared to locate in smaller communities;

– talent or skilled visas and faster and more flexible approval that allows employers to recruit the skilled labour they require;

– skilled migrant and family sponsorship schemes;

– seasonal and temporary work programmes for particular sectors of the economy;

– state, province or municipal specific schemes to attract immigrants to certain centres and regions, such as the State Specific Regional Migration Schemes (Australia); Provincial Nominee Programmes (Canada); and local economic development agencies (EDAs) in New Zealand;

– various provincial, state and municipal attraction and retention strategies;

– greater flexibility for foreign students to work during their education and post graduate work visas so that they can stay after their education;

– employer sponsorship programmes;

– community sponsorship programmes; and,

– programmes targeted to specific sectors of the labour force such as young farmers, viticulture workers and health care professionals or to provide labour for strategic initiatives.

Twenty-three per cent of New Zealand’s population is foreign-born and forty per cent of migrants have arrived in the past ten years. Newly arriving migrants tend to settle in spatially concentrated areas and this is especially true in New Zealand. This paper uses census data to examine the characteristics of local areas that attract new migrants and gauges the extent to which migrants are choosing to settle where there are the best labour market opportunities as opposed to where there are already established migrant networks. The paper estimates McFadden’s choice models to examine both the initial location choice made by new migrants and the internal mobility of this cohort of migrants five years later. This allows the authors to examine whether the factors that affect settlement decision change as migrants spend more time in New Zealand.


This paper exploits a Danish spatial dispersal policy on refugees, which can be regarded as a natural experiment to investigate the influence of regional factors on recent immigrants’ location choices. The main push factors are lack of co-nationals and immigrants. Additional push factors are lack of rental, including social, housing and lack of institutions for qualifying education, which explain why recent immigrants are attracted to large cities. Finally, placed refugees tend to leave locations with relatively high regional unemployment, and there is indirect evidence of welfare seeking.

**C.7 Connectedness**

This section includes studies that consider the connections that migrants have within the host country and with their country of origin and, in particular, the impact this might have on trade and investment networks.

It includes:

- an exploration of trust at the local and national level and its relationship with inequality and ethnic heterogeneity (Leigh, 2006)
- analysis of the effects of cultural barriers on migration between OECD countries (Belot & Ederveen, 2011)
- an exploration of “embedded connectedness” of highly skilled migrants with their home country through the Philippine case in New Zealand and Australia (Siar, 2014)
- analysis of the economic life of immigrants to Australia comparing pre- and post-1996 immigration policy (Borooah and Mangan, 2007)
- analysis of “cultural distance: as a determinant of bilateral trade flows (Tadesse and White, 2010)
- a study of “immigrant transnationalism” as an alternative form of immigrant economic adaptation (Portes et al 2002)
- a study, using evidence from the White Australia Policy, of cultural pluralism and trade (White and Tadesse, 2007)
• a review of how emigration (and the world-wide web of Australians) can have positive feedback effects for Australia, particularly those generated by diaspora business and knowledge networks (Fullilove & Flutter, 2004)
• a review of the links between migration, trade and investment (Dolman, 2008)
• analysis of the relationship between the age profile of retirement within an immigrant population in Australia and aggregate return migration rates for individuals from different countries of origin (Cobb-Clark and Stillman, 2013)
• Peri G and Requena-Silvente F (2010), The trade creation effect of immigrants: evidence from the remarkable case of Spain,
• an examination of the trade-related importance of Chinese and other immigrants into the USA (Co et al., 2004)


Using a large Australian social survey, combined with precise data on neighbourhood characteristics, this paper explores the factors that affect trust at a local level (‘localised trust’) and at a national level (‘generalised trust’). Trust is positively associated with the respondent’s education, and negatively associated with the amount of time spent commuting. At a neighbourhood level, trust is higher in affluent areas, and lower in ethnically and linguistically heterogeneous communities, with the effect being stronger for linguistic heterogeneity than ethnic heterogeneity. Linguistic heterogeneity reduces localised trust for both natives and immigrants, and reduces generalised trust only for immigrants. Instrumental variables specifications show similar results. In contrast to the USA, there is no apparent relationship between trust and inequality across neighbourhoods in Australia.


This paper uses a unique set of new indicators enabling us to test the effects of cultural barriers on migration between OECD countries. Using data on migration flows between 22 OECD countries over the period 1990–2003, the authors find strong evidence for the negative effect of cultural differences on international migration flows. Cultural barriers do a much better job in explaining the pattern of migration flows between developed countries than traditional economic variables such as income and unemployment differentials.


This paper provides empirical evidence of the “embedded connectedness” of highly skilled migrants with their home country through the Philippine case in New Zealand and Australia. This challenges the findings in other studies that show the weak connection between them and the home country which is generally explored more in terms of economic remittances.
While the majority of the participants in the study are already citizens of the host country, they remain emotionally tied and culturally connected to the Philippines as evidenced by their information-seeking behaviour, feeling of nostalgia, sending of remittances, taking of dual citizenship, attendance in Philippine-related events and the country they perceived as home. One interesting finding in the study is that most of them have taken citizenship for pragmatic reasons, that is, for the benefits and security that it could bring them. It concludes by emphasising the relevance of capitalising on these strong diasporic ties to entice the skilled diaspora to return to their home country and/or be involved in development activities back home.


A standard conclusion is that recent immigrants perform less well economically than the longer-term population. This paper investigates economic outcomes of immigrants to Australia. The history of Australian immigration policy is reviewed. Pre- and post-1996 immigration are compared using criteria that emphasize ability to make economic contributions. Entry conditions for immigrants to Australia resulted in new immigrants who were, on average, better educated than the local population and more likely to be computer literate. Post-1996 immigrants from Lebanon, North Africa and Vietnam overall did worse in terms of household income, employment status of occupation and housing conditions than local born and pre-1996 settled immigrants from these countries; however, arrivals from Europe, Britain, Ireland and New Zealand did equally well or better than native Australians and settled immigrants. The Chinese were the most successful non-European group with a half holding professional or managerial jobs. However, econometric analysis shows that ancestry per se is not a strong indicator of immigrant economic success, which is closely associated with education level and time of arrival.


The authors introduce ‘cultural distance’ as a measure of the degree to which shared norms and values in one country differ from those in another country, and employ a modified gravity specification to examine whether such cultural differences affect the volume of trade flows. Employing data for US state-level exports to the 75 trading partners for which measures of cultural distance can be constructed, the authors find that greater cultural differences between the United States and a trading partner reduces state-level exports to that country. This result holds for aggregate exports, cultural and non-cultural products exports as well, but with significantly different magnitudes. Immigrants are found to exert a pro-export effect that partially offsets the trade-inhibiting effects of cultural distance.

The recent literature on immigrant transnationalism points to an alternative form of economic adaptation of foreign minorities in advanced societies that is based on the mobilization of their cross-country social networks. Case studies have noted the phenomenon’s potential significance for immigrant integration into receiving countries and for the economic development in countries of origin. Despite their suggestive character, these studies consistently sample on the dependent variable (transnationalism), failing to establish the empirical existence of these activities beyond a few descriptive examples and their possible determinants. These issues are addressed using a survey designed explicitly for this purpose and conducted among selected Latin immigrant groups in the United States. Although immigrant trans-nationalism has received little attention in the mainstream sociological literature so far, it has the potential of altering the character of the new ethnic communities spawned by contemporary immigration. The empirical existence of transnationalism is examined on the basis of discriminant functions of migrant characteristics, and the relative probabilities of engaging in these kinds of activities is established based on hypotheses drawn from the literature. Implications for the sociology of immigration as well as for broader sociological theories of the economy are discussed.


 Examining data for Australia and 101 trading partners that span the years 1989–2000, the authors find immigrants from nations afforded preference under the White Australia policy exert greater proportional influences on Australian imports from their home countries compared to immigrants from nations not privy to such preference. Immigrants from this latter group of countries influence Australian exports to their home countries proportionally more than do immigrants from the former group. The authors also find immigrant-trade links vary across disaggregated measures of trade. The results suggest that cultural diversity, affected here by immigration policy, is relevant to a nation’s trade patterns.


There are approximately one million Australians outside Australia, perhaps three-quarters of whom live offshore on a permanent or long term basis. This latter group is large and, in the main, prosperous, well educated, well connected, and well-disposed to this country.

Two groups within the diaspora are of particular value to this country: those at the pinnacle of their careers in significant international positions, and the class of highly skilled professionals, or so-called ‘gold collar workers’, sitting just beneath them. Our view is that Australian institutions should reach out to these and other expatriates and capitalise on their talent and goodwill to further the national interest. The Australian diaspora should be seen as our ‘world wide web’ of ideas and influence.

Economic research indicates that emigration can have positive feedback effects, particularly those generated by diaspora business and knowledge networks. Expatriates can contribute
to their home country by influencing trade, investment and philanthropic flows, connecting local organisations to international developments and opportunities, and projecting a contemporary national image. International experience shows, for example, that emigrants can boost bilateral trade because of their knowledge of, and business contacts in, their home country’s market. Some of these benefits are already flowing to Australia.

In the final chapter we set out the following six recommendations:

Recommendation 1 The Australian government should lead from the top by embracing the Australian diaspora rhetorically. It should sharpen its interaction with expatriates through reforms to the Department of Foreign Affairs and Trade, including the establishment of a coordinating unit within the Department.

Recommendation 2 All sectors should energise their networking with the diaspora, particularly those sectors in which Australia can gain from better international collaboration and information exchange.

Recommendation 3 Institutions should strengthen expatriate linkages through short term return fellowships.

Recommendation 4 Non-profit organisations should pursue the fundraising opportunity offered by the diaspora, including combined efforts to achieve benefits of scale.

Recommendation 5 Government should reform overseas voting procedures to better accommodate expatriates, and establish a joint parliamentary standing committee on the diaspora.

Recommendation 6 Government agencies should collect more and better quality data on the diaspora. Because of the difficulty of making policy for a population that does not reside within the national borders, we suggest that the effectiveness of these policies in furthering the national interest should be assessed in three to five years’ time, and refined as appropriate.


Key points

• Migrants can help to build social and business networks that improve the quality of information flowing between countries and lower the costs of international trade and investment. This may particularly benefit Australia, which has a large and growing migrant population.

• The patterns of trade and investment across the OECD suggest that migrant networks are important. Countries tend to trade and invest more with countries from which they have received more migrants and, at least for trade, this relationship appears to be stronger where information barriers like distance and language would otherwise more greatly inhibit trade.
• This does not necessarily mean that countries with more migrants should be expected to trade and invest much more in total. This study finds that, by lowering the cost of trade between a pair of countries, migrants appear to reduce trade with other countries so that the overall effect on aggregate trade seems quite small. By contrast, there was no strong evidence that a reduction in investment with other countries accompanies the positive effect of migrants on bilateral investment.


https://ideas.repec.org/a/spr/izamig/v2y2013i1p1-2010.1186-2193-9039-2-20.html

The paper analyses the relationship between the age profile of retirement within an immigrant population and aggregate return migration rates for individuals from different countries of origin. The latter serves as a proxy for the relative net benefits of return migration to that origin country. The simple theoretical model illustrates that under reasonable conditions the probability of return migration is maximized at retirement. This implies that different immigrant populations will have different retirement profiles, not only because individual retirement behaviour differs, but also because the propensity for return migration varies. Consistent with our theoretical model, we estimate a negative relationship between immigrants’ retirement status and the aggregate return migration rate of their fellow countrymen. As theory suggests, this link is strongest for immigrants who are near the retirement age.


This paper investigates the immigration-trade link using data on individual exporting transactions and immigrants in Spanish provinces between 1995 and 2008. The authors quantify the impact of new immigrants on the extensive margin (number of transactions) and intensive margin (average value per transaction) of exports. The authors find that immigrants significantly increase exports and that the effect is almost entirely due to an increase in the extensive margin. Consistent with the idea that immigrants reduce the fixed cost of exporting, the authors find stronger effects for differentiated goods and for countries that are culturally distant from Spain.


Much has been written on the connection between migration and international trade. Human history provides important examples of migrations leading to increased trade activity, with perhaps the most well-known example of the ‘Overseas Chinese’. This study investigates the trade-related importance of Chinese and other immigrants into the USA. Previous studies may have underestimated (or overestimated) the relationship between
trade and migration with nations treated as featureless plains rather than as varied landscapes. This study contends that an understanding of the immigration–trade relationship can be improved upon by examining the specific pattern and destination of immigration into specific US states. Using state level export data to 28 immigrant source countries in 1993, a strong immigration–trade link is found, reinforcing conclusions made by previous research using country level data. The compelling connection between immigration and trade found in this study and others suggests that future changes to US immigration policies necessitate that their trade effects also be taken into account.

**C.8 Education and training**

This section covers the education and skills of migrants compared to native-born, and whether migrants’ education and skills are being fully utilised in the labour market. It covers the English language proficiency of different categories of migrants to Australia and whether host country qualifications make a difference. This section includes:

- an analysis of English language proficiency of immigrants to Australia by visa category (Chiswick et al., 2006)
- an examination of the extent of over-education on recently arrived immigrants to Australia (Green et al., 2007)
- an examination of whether host country qualifications mitigate the labour market disadvantages faced by immigrants in Australia (Parasnis et al., 2008)
- a comparison of the skills of migrants to Australia, Canada and the United States (Antecol et al, 2003)
- an analysis of the skills of and education of repeat, return and same-employer migrants in Western Germany (Hunt, 2004)
- an examination of the wages of immigrants compared to natives among engineering workers in the United States (Hunt, 2013)
- an examination of the over-education of migrants in Denmark (Nielson, 2009)
- an analysis of how the skill characteristics of Canadians are affected by changes to immigration policy levels, including the point system (Beach et al., 2006)
- an examination of whether high-skilled immigrants to the US work in high-skilled jobs and the impact on earnings (Chiswick, 2011)
- an analysis of second-generation immigrants and their educational attainment (Lüdemann and Schwerdt, 2013)
- an examination of the impact of migration on educational attainment in rural Mexico (McKenzie and Rapoport, 2011)
- a study of educational integration of students with migration background using data from five international student assessment studies (Schneeweis, 2011)
- a DIBP (2014) publication which includes a section on the education attainment of the children of migrants
- an examination of differences in educational attainment between natives and children of immigrants to Canada (Hansen and Kučera, 2004)
- a study of the respective influences of intergenerational transmission and the environment in shaping trust (Moschion and Tabasso, 2014)
This article is concerned with the determinants of English language proficiency among immigrants in a longitudinal survey for Australia. It focuses on both visa category and variables derived from an economic model of the determinants of destination-language proficiency among immigrants. Skills-tested and economic immigrants have the greatest proficiency shortly after immigration, followed by family-based visa recipients, with refugees having the lowest proficiency. Other variables the same, these differences disappear by 3.5 years after immigration for speaking skills; and although they diminish, they persist longer for reading and writing skills. The variables generated from the model of destination-language proficiency (such as schooling and age at migration) are, in part, predictions of visa category, but they are more important statistically for explaining proficiency.

Australian immigration policy, in common with the US and Canada, has increased the emphasis on skill-based selection criteria. A key premise of this policy is that skilled immigrants are more employable and can add to the productive capacity of the economy. However, this effect will be diminished if immigrants are working in occupations that fail to utilise their skills. The paper examines the extent of over-education for recently arrived immigrants to Australia. The paper finds that they are more likely to be over-educated than the native population, even if they enter on skill assessed visas. Over-education is greater for immigrants from non-English speaking backgrounds (NESB) and generates lower returns to education. Tighter restrictions to welfare support on entry raised employment levels but increased over-education. This will serve to reduce the potential productivity gains from skill biased immigration policies.

The current Australian migration programme rewards applicants for possessing Australian tertiary qualifications. This study examines whether such qualifications help mitigate the labour market disadvantages faced by immigrants in Australia. The effect of host country qualification on labour market assimilation is estimated by comparing the labour force participation and unemployment of natives with two groups of migrants: those holding foreign qualifications and those holding Australian qualifications. Controlling for factors such as level of education and experience, there is no evidence that Australian qualifications result in better labour market outcomes for migrants.


Census data for 1990/91 indicate that Australian and Canadian immigrants have higher levels of English fluency, education, and income (relative to natives) than do U.S. immigrants. This skill deficit for U.S. immigrants arises primarily because the United States receives a much larger share of immigrants from Latin America than do the other two countries. After excluding Latin American immigrants, the observable skills of immigrants are similar in the three countries. These patterns suggest that the comparatively low overall skill level of U.S. immigrants may have more to do with geographic and historical ties to Mexico than with the fact that skill-based admissions are less important in the United States than in Australia and Canada.


The paper examines the determinants of inter-state migration of adults within western Germany, using the German Socio-Economic Panel from 1984-2000. Migrants who do not change employers represent one-fifth of all migrants and have higher education and pre-move wages than non-migrants. Skilled workers thus have a low-cost migration avenue that has not been considered in the previous literature. Other migrants are heterogeneous and not unambiguously more skilled than non-migrants. The paper confirms that long-distance migrants are more skilled than short-distance migrants, as predicted by theory, and shows that return migrants are a mix of successes and failures. Most repeat migration is return migration.


Using the American Community Surveys of 2009 and 2010, the paper examines the wages of immigrants compared to natives among engineering workers. Among workers in engineering occupations, immigrants are the best and brightest thanks to their high education level, enjoying a wage distribution shifted to the right of the native distribution. Among workers with an engineering degree, however, immigrants underperform natives, despite somewhat higher education. The gap is particularly large in the lower tail, where immigrants work in occupations not commensurate with their education. In the upper tail, immigrants fail to be promoted out of technical occupations to management, handicapped by imperfect English and their underrepresentation among older age groups. In both samples, immigrants from the highest income countries are the best and brightest workers.


This paper uses register-based panel data to examine over-education amongst immigrants in Denmark. Foreign-educated immigrants are found to be more prone to over-education than both native Danes and immigrants educated in Denmark. Labour market experience reduces this risk, whereas periods of unemployment make a person more likely to accept a job for which he is over-qualified. Over-educated workers earn slightly more than their adequately matched colleagues, but less than if they had been appropriately matched in a higher level.

This paper examines how changes in immigration policy levers actually affect the skill characteristics of immigrant arrivals using a unique Canadian immigrant landings database. The paper first reviews the Canadian experience with a point system as part of its immigrant policy. Section III of the paper describes some overall patterns of immigrant arrivals since 1980. Section IV identifies some relevant hypotheses on the possible effects on immigrant skill characteristics of the total immigration rate, the point system weights and immigrant class weights. The “skill” admissions examined are level of education, age, and fluency in either English or French. Regressions are then used to test the hypotheses from Canadian landings data. It is found that (i) the larger the inflow rate of immigrants the lower the average skill level of the arrivals; (ii) increasing the proportion of skill-evaluated immigrants raises average skill levels; (iii) increasing point system weights on a specific skill dimension indeed has the intended effect of raising average skill levels in this dimension among arriving principal applicants; and (iv) increasing the proportion of skill-evaluated immigrants appears to have the strongest effects among the immigration policy levers.


This paper examines the incidence of the mismatch of the educational attainment and the occupation of employment, and the impact of this mismatch on the earnings, of high-skilled adult male immigrants in the US labor market. Analyses for high-skilled adult male native-born workers are also presented for comparison purposes. The results show that over-education is widespread in the high-skilled US labor market, both for immigrants and the native born. The extent of over-education declines with duration in the US as high-skilled immigrants obtain jobs commensurate with their educational level. Years of schooling that are above that which is usual for a worker’s occupation are associated with very low increases in earnings. Indeed, in the first 10 to 20 years in the US years of over-education among high-skilled workers have a negative effect on earnings. This ineffective use of surplus education appears across all occupations and high-skilled education levels. Although schooling serves as a pathway to occupational attainment, earnings appear to be more closely linked to a worker’s occupation than to the individual’s level of schooling.


Research on immigrants’ educational disadvantages documents substantial immigrant–native achievement gaps in standardized student assessments. Exploiting data from the German PIRLS extension, the paper finds that second-generation immigrants also receive worse grades and teacher recommendations for secondary school tracks than natives, which
cannot be explained by differences in student achievement tests and general intelligence. Second-generation immigrants’ less favorable socioeconomic background largely accounts for this additional disadvantage, suggesting that immigrants are disproportionately affected by prevailing social inequalities at the transition to secondary school. The paper additionally shows that differences in track attendance account for a substantial part of the immigrant–native wage gap in Germany.


This paper examines the impact of migration on educational attainment in rural Mexico. Using historical migration rates to instrument for current migration, the paper finds evidence of a significant negative effect of migration on schooling attendance and attainment. IV-censored ordered probits show that living in a migrant household lowers the chances of boys completing junior high school and of boys and girls completing high school. The paper finds that the observed decrease in schooling of 16- to 18-year-olds is accounted for by current migration of boys and increased housework for girls.


In this paper, the author studies educational integration of students with migration background using data from five international student assessment studies. First, Blinder–Oaxaca decompositions are used to allow for a comparison of integration of migrant students across countries and time. In a second step, integration is related to institutional characteristics of the schooling system. Pooled, country-group and country fixed effects estimation show that time in school and early education are positively related to the integration of students with migration background. Furthermore, in the OECD countries, educational integration in science is positively related to external student assessment policies.


This paper examines differences in educational attainment between natives and children of immigrants to Canada. The paper introduces two definitions of second generation immigrants: The first considers all children with at least one immigrant parent to be second-generation immigrants, while the second definition requires that both parents were foreign-born. In the data, regardless of which definition is used, immigrants' children have more education, on average, than their native counterparts. To analyze educational attainments, the paper first outlines a simple economic model of schooling and then proceeds by estimating a sequence of ordered discrete choice models. The estimated marginal effects

suggest that a part of the observed educational difference between natives and second-generation immigrants can be explained by differences in family background, such as parents' education and mother tongue, but a significant difference remains even after controlling for these characteristics. Moreover, the educational difference prevails even when the authors apply the narrower definition of second-generation immigrants.


This paper studies the respective influences of intergenerational transmission and the environment in shaping individual trust. Focusing on second generation immigrants in Australia and the United States, the authors exploit the variation in the home country and in the host country to separate the effect of cultural transmission from that of the social and economic conditions on individual trust. The results indicate that trust in the home country contributes to the trust of second generation immigrants in both of the host countries, and marginally more in the United States. Social and economic conditions in the host country also affect individual trust.

**C.9 Innovation, and research and development**

This section covers the relationship between migration and innovation, and research and development. Jensen (2014) points to the emerging international literature on the impact of migration on innovation, and proposes how the evidence base for policy-making in Australia could be improved. This section includes:

- a review of international literature on the relationship between migration and innovation, and ideas for improving evidence base in Australia (Jensen, 2014)
- an examination of the relationship between local workforce characteristics (e.g. presence of migrants) and the likelihood of innovation by firms (using firm-level innovation data and area-level Census)—which country? (Maré, Fabling and Stillman, 2012)
- an analysis of how immigrants (by type of visa) to the US fare by comparison to natives in wages, patenting and publishing (Hunt, 2011)
- an analysis of the extent to which skilled immigrants increase innovation in the US (Hunt and Gauthier-Loselle, 2010)
- an analysis of the impact of population ageing and immigration on aspects of regional competitiveness in New Zealand such as innovation, entrepreneurship and productivity (Poot, 2007)
- an analysis of the role of foreign graduate students and postdoctoral scholars in US university research by examining authorship patterns (Black and Stephan, 2008)
- an analysis of the mobility of immigrant scientists across sixteen countries (Franzoni et al., 2012)
- an analysis of the decisions of foreign-born PhD and postdoctoral trainees to come to the US versus to another country for training (Stephan et al., 2013)
an analysis of the performance of migrant versus domestic scientists (Chiara et al., 2014) — which country?

- a report of the experience of American female immigrant entrepreneurs, with policy advice on how to improve their experience (Pearce et al., 2011)

- an evaluation of the impact of high-skilled immigrants on US technology formation (Kerr and William, 2010)


Although immigration debates in the popular press sometimes focus on the perceived negative aspects, immigrants may actually stimulate innovation, thereby promoting job creation and enhancing productivity. Although there is an emerging international literature on the impact of migration on innovation, Australian studies are limited. Given the importance of net immigration to Australian society, this is an oversight. In this article, recent developments in the international literature on the migration–innovation relationship are critically reviewed and their implications for the debate in Australia are considered. Moreover, some ideas on how to improve the evidence base for policy-making in Australia are proposed.

Maré D, Fabling R and Stillman S (2012), Innovation and the local workforce, Papers in Regional Science, Volume 93, Issue 1, pages 183–201, March 2014

The authors combine firm-level innovation data with area-level Census data to examine the relationship between local workforce characteristics, especially the presence of immigrants and local skills, and the likelihood of innovation by firms. The paper examines a range of innovation outcomes, and tests the relationship for selected subgroups of firms. It finds a positive relationship between local workforce characteristics and average innovation outcomes in labour market areas, but this is accounted for by variation in firm characteristics such as firm size, industry, and research and development expenditure. Controlling for these influences, the paper finds no systematic evidence of an independent link between local workforce characteristics and innovation.


Using the 2003 National Survey of College Graduates, the paper examines how immigrants perform in activities likely to increase U.S. productivity, according to the type of visa on which they first entered the United States. Immigrants who entered on a student/trainee visa or a temporary work visa have a large advantage over natives in wages, patenting, and publishing. Much of the advantage is explained by immigrants' higher education and field of study. Immigrants who entered with legal permanent residence do not outperform natives for any of the outcomes considered. Immigrants are more likely to start companies than similar natives.

The paper measures the extent to which skilled immigrants increase innovation in the United States. The 2003 National Survey of College Graduates shows that immigrants patent at double the native rate, due to their disproportionate holding of science and engineering degrees. Using a 1940-2000 state panel, the analysis shows that a 1 percentage point increase in immigrant college graduates' population share increases patents per capita by 9-18 per cent. The instrument for the change in the skilled immigrant share is based on the 1940 distribution across states of immigrants from various source regions and the subsequent national increase in skilled immigration from these regions. (JEL J24, J61, O31, O33)


The demographic profile of a region is usually seen as a slowly changing background phenomenon in the analysis of regional competitiveness and regional growth. However, regional demographic change can have a significant impact on regional competitiveness and such change is often more rapid and profound than at the national level. In turn, regional population size, growth, composition and distribution are endogenous to regional economic development. This paper focuses on the impact of population ageing and immigration on aspects of regional competitiveness such as innovation, entrepreneurship and productivity. Immigration and ageing trends have generated huge separate literatures but it is argued here that it is fruitful to consider these trends jointly. Theoretically, there are many channels through which immigration and population ageing can affect regional competitiveness. There is empirical evidence that population ageing reduces regional competitiveness, while immigration – particularly of entrepreneurs and highly skilled workers to metropolitan areas – enhances competitiveness. Much of the available literature is based on small scale case studies and rigorous econometric research on the impact of demographic change at the regional level is still remarkably rare. Some directions for further research are suggested.

Black, Grant C. and Stephan, Paula E (2008), The Economics of University Lab Science and the Role of Foreign Graduate Students and Postdoctoral Scholars, Andrew Young School of Policy Studies Research Paper Series No. 09-02.


The paper documents the role that students and postdoctoral scholars (postdocs) play in university research by analyzing authorship patterns for a six month period for articles published in Science having a last author affiliated with a U.S. university. The paper sample is composed of 133 papers with fewer than ten authors, for which we determine the status of all authors residing in the U.S., and for 159 papers regardless of the number of authors, for which the authors determine the status of first and last author. The analysis finds that 86.5
per cent of papers-nearly seven out of eight (133 paper sample) - have either a current postdoc or a student as one of the authors. The analysis finds that 103 of the 138 first authors who are in the U.S. and whose position is known are either a postdoc or a student (74.6 per cent).

The paper identifies the ethnicity of authors, drawing on the ethnic-name database created by William Kerr (2008). It finds that 59.1 per cent of postdoc authors are neither English nor European and that 39.6 per cent of the graduate student co-authors have neither English nor European names. At the paper level, it infers that 70 of the 133 papers (53 per cent) have a foreign student or postdoc as a co-author. The paper infers that almost 60 per cent of the graduate student first authors are foreign and that non-citizens make up slightly more than 54 per cent of the postdocs who are first authors. The paper concludes that international graduate students and postdocs are not only important in staffing university labs; they play lead roles in university research.


The paper reports results from the first systematic study of the mobility of scientists engaged in research in a large number of countries. Data were collected from 17,182 respondents using a web-based survey of corresponding authors in 16 countries in four fields during 2011. The paper finds considerable variation across countries, both in terms of immigration and emigration patterns. Switzerland has the largest percentage of immigrant scientists working in country (56.7); Canada, and Australia trail by nine or more per cent; the U.S. and Sweden by approximately eighteen per cent. India has the lowest (0.8), followed closely by Italy and Japan. The most likely reason to come to a country for postdoctoral study or work is professional. Our survey methodology also allows us to study emigration patterns of individuals who were living in one of the 16 countries at age 18. Again, considerable variation exists by country. India heads the list with three in eight of those living in country when they were 18 out of country in 2011. The country with the lowest diaspora is Japan. Return rates also vary by country, with emigrants from Spain being most likely to return and those from India being least likely to return. Regardless of country, the most likely reason respondents report for returning to one's home country is family or personal.


The paper analyzes the decisions of foreign-born PhD and postdoctoral trainees to come to the United States vs. go to another country for training. Data are drawn from the GlobSci survey of scientists in sixteen countries working in four fields. The authors find that individuals come to the U.S. to train because of the prestige of its programmes and/or career prospects. They are discouraged from training in the United States because of the
perceived lifestyle. The availability of exchange programmes elsewhere discourages coming for PhD study; the relative unattractiveness of fringe benefits discourages coming for postdoctoral study. Countries that have been nibbling at the U.S.-PhD and postdoc share are Australia, Germany, and Switzerland; France and Great Britain have gained appeal in attracting postdocs, but not in attracting PhD students. Canada has made gains in neither.


https://ideas.repec.org/a/eee/ecolet/v122y2014i1p89-93.html

Migrant scientists outperform domestic scientists. The result persists after instrumenting migration for reasons of work or study with migration in childhood to minimize the effect of selection. The results are consistent with theories of knowledge recombination and specialty matching.


A report adapted from the book, Immigration and Women: Understanding the American Experience (New York University Press, 2011) which profiles migrant women business owners who have created scores of new jobs, helped stabilize neighbourhoods, created products that consumers enjoy, built major infrastructure projects, and invested in a wide range of charitable social-justice projects. Keenly aware of the advantages that business ownership brings, these women want to see an easier and more transparent process for their entrepreneurial successors. Among their advice and suggestions for improvement were:

- Make start-up capital easier to access—and in larger amounts.
- Remove or reform bureaucratic hurdles to start-ups.
- Provide clearer information on local, state, and federal regulations.
- Given the realities of discrimination, renew efforts to support set-asides, based on gender as well as nativity and race.
- Continue to address barriers to women’s success in the conventional workplace.
- Accelerate attempts to make it easier to balance paid employment with family demands.

The report notes that many women start businesses after disappointments with discrimination in the conventional workplace, related to gender, race, age, or nativity and although such negative experiences help till the ground for new start-ups, this does not imply that such problems do not need reform.


This study evaluates the impact of high-skilled immigrants on US technology formation. The study uses reduced-form specifications that exploit large changes in the H-1B visa programme. Higher H-1B admissions increase immigrant science and engineering (SE) employment and patenting by inventors with Indian and Chinese names in cities and firms.
dependent upon the programme relative to their peers. Most specifications find limited effects for native SE employment or patenting. The study is able to rule out displacement effects, and small crowding-in effects may exist. Total SE employment and invention increases with higher admissions primarily through direct contributions of immigrants.

### C.10 Barriers to integration

This section looks at barriers to integration and covers economic impacts of social diversity (and consequent barriers of communication) and the discrimination against migrants. It includes:

- analysis of whether Asian migrants are discriminated against in the Australian Labour market (Junankar et al., 2004)
- analysis of the economic impacts of social diversity in Canada and the United States (Ratna et al., 2012)
- an explanation of the differences in cross-country productivity performance by modelling and testing the effects of social barriers to communication on productivity and capital accumulation (Grafton et al., 2007)


This paper explores the issue of discrimination against Asian migrants in the Australian labour market using a unique panel data set, the Longitudinal Survey of Immigrants to Australia (LSIA). This paper estimates models of the probability of being unemployed for Asian and non-Asian migrants controlling for various characteristics including age, education, and English language ability. More importantly, the analysis controls for the visa status of the migrants. The results suggest that there are significant “unexplained differences” for males that may be ascribed to “discrimination” against Asian migrants. However, the results for females are mixed: the evidence suggests that Asian females do worse than non-Asian females only in the first year after arrival.


This paper investigates the economic impacts of social diversity and the consequent barriers of communication in Canada and the United States. Social diversity is explained by linguistic, cultural and religious differences across the 48 contiguous states in the United States and the 10 provinces in Canada. The ordinary least squares (OLS) and instrumental variables estimation show that social diversity increases per capita gross domestic product at the state and province level, but the positive economic pay-off from diversity diminishes as the level of fluency in official language declines. The empirical results provide an
important economic rationale for overcoming linguistic divisions and “inclusive” multiculturalism in other pluralistic countries, such as Australia.


The paper contributes to the explanation of the large differences in cross-country productivity performance by modelling and testing the effects of social barriers to communication on productivity and capital accumulation. In an optimal growth model, social barriers to communication, which impede the formation of knowledge connections, are shown to reduce both transitory and steady-state levels of total factor productivity (TFP), per capita consumption and reproducible capital. Empirical testing yields a robust and theoretically consistent result: linguistic barriers to communication reduce productivity and capital accumulation. The findings provide an explanation for cross-country differences in TFP, and fresh insights into how productivity ‘catch up’ may be initiated.

C.11 Policy evaluation and debate

This section covers the impact of specific immigration policy/policies and how immigration policy might be reformed to enhance the economic impact of immigration. It includes:

- a review of recent reforms to Australia’s skilled migration selection policies (Cully, 2011)
- reflections on the economic impact of Australia’s skilled migration policy (Robertson, 2007)
- the impact of high-skilled versus low-skilled immigration policies for the host country (Chiswick, 2011), prepared for the Productivity Commission of Australia
- an analysis of the factors leading to the policy shift post-1997 which included mandatory English language testing, qualifications screening, incentives for international students to migrate and abolition of income support in the first two years post arrival (Hawthorne, 2005)
- the impact of the trans-Tasman travel agreements on mutual exchange of migrants between Australia and New Zealand (Sinning and Stillman, 2012)
- the relationship between immigration policy in Australia, Canada and New Zealand and the skills of immigrants (Antecol et al., 2003)
- a presentation of eight policies that could boost the economic contribution of employment-based immigration (Papademetriou and Sumption, 2011), drawing on experience from Asia, Europe, North America and the Pacific region
- a proposal for a standing commission on labor markets, economic competitiveness and immigration in the US (Papademetriou et al., 2009)
- a policy brief on how immigration policy could be reformed to increase the ‘brain gain’ of the US (Darrell, 20110
- an examination of how the regulatory character of market institutions shapes government responses to labour shortages, with particular reference to immigration policy (Wright, 2012)

Cully, M (2011) Skilled migration selection policies: recent Australian reforms, Migration Policy Practice, vol. 1, no.1, pp.4-7
Many countries now look to Australia, and other traditional settlement countries such as Canada, to emulate such policies. This article investigates whether skilled migration selection policies work, using Australia as a case study. It also provides an overview of recent reforms.

This article has shown that for a country like Australia, which is blessed in having more people wishing to migrate to it than the places it makes available, migrant selection policies do work: they deliver markedly superior labour market outcomes than would accrue if would-be migrants were chosen at random.


This paper outlines some recent points of debate over the economic impact of skilled migration on Australia. It is argued that the national gains from an increase in skilled immigration are likely to be small but there are significant effects on income distribution. Recent general equilibrium modelling results are used to show that the skill based immigration programme is a blunt instrument for targeting particular skills needs and may have many potential unintended consequences, including the “crowding-out” of higher education in Australia.

The aim of this paper is to provide a brief survey of economic perspectives of the costs and benefits of importing skilled labour, focusing, in particular, on the recent study by the Productivity Commission (2006) report and the ensuing debate.


This policy analysis paper explores the implications for the host country population of alternative immigration policies. The two immigration options considered are a policy based on admitting primarily high-skilled workers and another that has the effect of admitting primarily low-skilled workers. The implications for the native-born population for their aggregate level of income, the distribution of their income by skill level, and the size of the income redistribution system are considered. The paper was prepared for the Productivity Commission of Australia.


From 1980 to 1996, Australian researchers identified consistently inferior labor market outcomes for professionals from non-English-speaking background source countries. In 1997, the incoming conservative government initiated a major review of Australia’s skilled migration programme, based on a determination to ‘select for success’ among applicants.
Subsequent initiatives included mandatory English language testing, rigorous qualifications screening, incentives for international students to migrate, and abolition of income support in the first two years post arrival. This article provides a detailed analysis of factors leading to this policy transformation. Labor market outcomes for 2001 are defined, including a halving of unemployment among recently arrived migrants.


https://ideas.repec.org/p/otg/wpaper/1204.html

This paper exploits the existence of the trans-Tasman travel agreement and the availability of comparable census data in Australia and New Zealand to examine the extent to which individuals respond to different labour market conditions in the two countries (and their subregions), as well as measures of local amenities and cost of living when deciding where to live. Our findings suggest that the trans-Tasman travel agreement did contribute to a mutual exchange of migrants with many similarities regarding the size and human capital endowment of migration flows in both directions. However, considerable differences between the two countries remain with regard to internal, trans-Tasman and other international migration.


Census data for 1990/91 indicate that Australian and Canadian immigrants have higher levels of English fluency, education, and income (relative to natives) than do U.S. immigrants. This skill deficit for U.S. immigrants arises primarily because the United States receives a much larger share of immigrants from Latin America than do the other two countries. After excluding Latin American immigrants, the observable skills of immigrants are similar in the three countries. These patterns suggest that the comparatively low overall skill level of U.S. immigrants may have more to do with geographic and historical ties to Mexico than with the fact that skill-based admissions are less important in the United States than in Australia and Canada.


This paper examines how changes in immigration policy levers actually affect the skill characteristics of immigrant arrivals using a unique Canadian immigrant landings database. The paper first reviews the Canadian experience with a point system as part of its immigrant policy. Section III of the paper describes some overall patterns of immigrant arrivals since 1980. Section IV identifies some relevant hypotheses on the possible effects on immigrant skill characteristics of the total immigration rate, the point system weights and immigrant class weights. The “skill” admissions examined are level of education, age, and fluency in
either English or French. Regressions are then used to test the hypotheses from Canadian landings data. It is found that (i) the larger the inflow rate of immigrants the lower the average skill level of the arrivals; (ii) increasing the proportion of skill-evaluated immigrants raises average skill levels; (iii) increasing point system weights on a specific skill dimension indeed has the intended effect of raising average skill levels in this dimension among arriving principal applicants; and (iv) increasing the proportion of skill-evaluated immigrants appears to have the strongest effects among the immigration policy levers.


This paper argues that since the late 1980s in Australia, the key determinant of migration policy has been the labour market outcomes of migrants. This is not to argue that the debate conducted amongst economists on other economic aspects of the impact of migration is of no value. Rather it is to claim that such debates have much less influence in present policy settings than was the case in earlier years. In substantiating this point the main lines of reform as regards the selection of migrants since the late 1980s will be detailed.


Two separate cohorts of immigrants to Australia are compared in order to assess the potential role of immigrant selection criteria, labor market conditions, and income-support policy in facilitating the labor market adjustment of new arrivals. Although these two cohorts entered Australia only five years apart, their initial labor market outcomes varied dramatically. The results indicate that changes in immigration policy may have led to increased human capital endowments that in turn resulted in higher participation rates and reduced unemployment. At the same time, improvement in Australian labor market conditions and changes in income-support policy over the 1990s – which most likely altered the returns to human capital – were probably instrumental in reinforcing the effects of tighter immigrant selection criteria. As much as half of the fall in unemployment rates among women and one third the decline among men appears to have occurred as the result of changes in the returns to demographic and human capital characteristics.


Drawing on experiences from Asia, Europe, North America, and the Pacific region, this policy memo presents eight strategies developed by immigrant-receiving countries to increase the economic contribution of employment-based immigration. These policies represent best practices that policymakers can rely on to create effective and efficient economic-stream immigration systems.
The policies discussed focus on selecting immigrants with a range of skill levels, retaining those with the greatest potential to succeed, engaging employers constructively in the immigration process, and facilitating immigrant integration. They comprise the following:

- Creating temporary-to-permanent visa pathways
- Streamlining immigration for the most skilled workers
- Retaining top foreign students
- Reconsidering the role of visa fees
- Rewarding employers who play by the rules
- Building institutions with adaptation and flexibility at their core
- Taking a strategic approach to immigrant integration
- Seeking regional and local engagement in the admissions process.


This paper focusses on the shortcomings of the US immigration in relation to labour market economic growth and competitiveness issues. It proposes the creation of a permanent and independent body to manage labour market immigration as a strategic resource to meet US needs while protecting US wages and conditions and supporting economic growth and competitiveness.


One of the strongest narratives in U.S. history has been the contribution made by talented, hard-working and entrepreneurial immigrants whose skills and knowledge created a prosperous new country. Yet today, the nation’s immigration priorities and outmoded visa system discourage skilled immigrants and hobble the technology-intensive employers who would hire them. These policies work against urgent national economic priorities, such as boosting economic vitality, achieving greater competitiveness in the global marketplace and renewing our innovation leadership. In the long term, the nation needs comprehensive immigration reform. In the short term, policymakers should focus on reforms that are directly related to increasing the “brain gain” for the nation—creating new jobs and producing economic benefits—to produce tangible and achievable improvements in our immigration system.


This article examines how the regulatory character of market institutions shapes government responses to labour shortages, with particular reference to immigration policy. The period between the late 1990s and the late 2000s saw many advanced economies relax
entry controls on select categories of foreign workers. This trend was most pronounced among states with liberal market institutions. The underlying reasons for these trends are analysed through an examination of the motivations for reform in Australia and the UK, two states that oversaw significant liberalisations of their labour immigration policies. It argues that the liberal character of key market institutions encouraged firms in these states to look to external rather than internal solutions for meeting their labour requirements. These findings suggest that perspectives from the comparative political economy scholarship, most notably the varieties of capitalism literature, may provide insights into the way that different modes of market regulation shape immigration policy preferences.
REFERENCES


Black, G.C. and Stephan, P.E. (2008), The Economics of University Lab Science and the Role of Foreign Graduate Students and Postdoctoral Scholars, Andrew Young School of Policy Studies Research Paper Series No. 09-02.


Cully, M (2011) Skilled migration selection policies: recent Australian reforms, Migration Policy Practice 1(1) 4-7


Dostie, B. (2011) Wages, Productivity and Aging, De Economist, 159(2)se 139-158.


Productivity Commission (2014), Geographic Labour Mobility, Research Report, Canberra.


Ryan, B. and Gross, N.C. (1943) The Diffusion of Hybrid Seed Corn in Two Iowa Communities, Rural Sociology, 8(1) 15-24.


Taylor, A.J., Bell, L. and Gerritsen, R. (2014) Benefits of Skilled Migration Programs for Regional Australia: Perspectives from the Northern Territory, *Journal of Economic and Social Policy*,16(1) 35-69.


