



OECD Regional Development Papers No. 39

Regional productivity, local
labour markets,
and migration in Australia

OECD

<https://dx.doi.org/10.1787/3cc8f669-en>

Regional productivity, local labour markets, and migration in Australia

This paper offers an overview of recent trends in regional employment and productivity, and describes the characteristics and geographic distribution of migrants in Australia. Additionally, it provides insights on the relationship between migration, employment, and productivity at the regional level in Australia as well as in other OECD regions. It shows that migrants in Australia are more likely to live in metropolitan regions and have much higher average education relative to native-born than in other OECD countries. Yet, despite their higher level of education, migrants have lower employment rates, mainly arising from a low labour market participation of foreign-born women. It also documents that regions with a higher share of migrants also have higher native employment rates and higher levels of labour productivity.

JEL codes: R10, J61, R23

Keywords: Australia, migration, productivity, labour markets

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Acknowledgements

This paper was prepared by the OECD Centre for Entrepreneurship, SMEs, Regions and Cities (CFE) led by Lamia Kamal-Chaoui, Director. The work was conducted as part of the OECD Regional Development Policy Committee's program of work with financial support from the Centre for Population at the Australian Treasury.

The analysis and preparation of this paper were managed and co-ordinated by Cem Özgüzel with the guidance of Paolo Veneri, Head of the Statistics and Territorial Analysis Unit, under the supervision of Rüdiger Ahrend, Head of the Economic Analysis, Data and Statistics Division. The paper was drafted by Jasper Hesse (OECD) and Cem Özgüzel (OECD). Lukas Kleine-Rüschkamp (OECD) provided drafting contributions throughout the entire working paper. The paper benefitted from the valuable comments of Nadim Ahmad, Alexander Hijzen, Lars Ludolph, Ana Moreno-Monroy, and Alison Weingarden (all OECD). Diego Faurès, Eric Gonnard and Claire Hoffmann (all OECD) provided statistical support.

The paper benefitted from valuable reviews and comments by Patrick Fazzino IV, Rodrigo Rodrigues and Kasey Stanfield (all Centre for Population), Rosemary Kenna and Connie Lu (both Department of Home Affairs), Nathan Deutscher (Australian Treasury) and Peter Varela. Additional helpful comments were provided by the Australian Treasury, the Australian Bureau of Statistics, the Department of Home Affairs, the Department of Employment and Workplace Relations, the Department of Education, the Department of Prime Minister and Cabinet, the Department of Infrastructure, the Transport, Regional Development, Communications and the Arts, Productivity Commission, Jobs and Skills Australia, the Grattan Institute, and the Committee for the Economic Development of Australia.

Table of contents

Acknowledgements	3
Executive summary	6
1 Introduction	7
2 Migration in Australia	9
The migrant population in Australian regions	9
Migrants in Australia are among the most educated in the OECD	14
3 Migrants and local labour markets	20
Australia's labour market in an international comparison	20
How do migrants affect local labour markets?	26
4 Migrants and local productivity	34
Labour productivity in Australia and across major OECD countries	34
How are migration and productivity linked across space?	35
Regional correlation between migration and productivity	37
Conclusions	40
References	41
Annex A. Additional information on data sources	43
Annex B. Comparing Australian regions with other OECD regions	45
Annex C. Recent trends in the Australian economy	47
Annex D. Sectoral composition of Australia and its regions	49
FIGURES	
Figure 1. The migrant share in Australia is one of the highest among OECD countries	9
Figure 2. In Australia, the migrant share is highest in metropolitan regions	10
Figure 3. Migrants and native-born are concentrated in large metropolitan regions	12
Figure 4. The share of migrants is highest in cities and Western Australia	13
Figure 5. Most Australian immigrants are born in Asia or Europe	14

Figure 6. Migrants in Australia and Canada are best educated	15
Figure 7. Educational attainment of migrants across OECD regions	16
Figure 8 Migrants are often more educated than their native counterparts	18
Figure 9. Migrants are better educated than natives across all Australian states and territories	19
Figure 10. The Australian employment rate increased more than most OECD countries	21
Figure 11. Native-born are more likely to be employed than foreign-born across OECD countries	22
Figure 12. The native-migrant-employment gap follows geographical patterns	23
Figure 13. The female native-migrant employment gap is larger than the male native-migrant gap	24
Figure 14. The employment gap remains in all educational groups	25
Figure 15. Positive association between migration and native employment	29
Figure 16. Native employment is highest in metropolitan areas	30
Figure 17. Stronger positive correlation for less-educated natives	31
Figure 18. Uneven correlation between male and female native employment	33
Figure 19. Labour productivity grew in Australia	35
Figure 20. Regional growth in the migrant share and GVA per worker	36
Figure 21. Regional labour productivity and the share of migrants are positively correlated	39
Figure A B.1. Participation and unemployment rate of native-born and migrants by gender	46
Figure A C.1. GDP per capita across selected countries and within Australia	48
Figure A D.1. International employment and GVA by sector	50
Figure A D.2. Australian employment and GVA by sector and state/territory	51

TABLES

Table 1. Overview: Regional classification and access to FUAs	11
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Executive summary

- Australia has the highest share of migrants in the OECD, after Luxembourg. Migrants make up 30% of the population in Australia, more than twice the OECD average (14%).
- Like most other OECD countries, migrants are more likely to live in metropolitan areas than their native-born counterparts. In Australia, eight out of ten people born abroad live in metropolitan regions compared to seven out of ten native-born.
- Australia has one of the highest educated migrant populations among OECD countries. Almost 60% of the migrant population in Australia has attained tertiary education, compared to around 40% of the native population and around 40% of migrants in other OECD countries.
- Despite their higher level of education, migrants have lower employment rates relative to the native population in their regions, indicating untapped potential in regional labour markets. The gap mainly arises from a low labour market participation of migrant women.
- Similar to other OECD countries, migrants are more likely to live in areas where employment rates among native-born workers are higher. The strength of this relationship varies depending on the education and gender of the native-born workers.
- Australian regions with higher shares of migrants tend to have higher productivity levels. On average, a one percentage point higher share of migrants in the local population is associated with higher labour productivity of roughly 1490 AUD. Once the differences in the skill composition of workers across regions are taken into account, the correlation halves (780 AUD).

1 Introduction

Australia is one of the largest migrant-receiving countries worldwide and has a long history of migration. In 2019, the share of migrants in the Australian population reached 30%, more than twice the OECD average (14%) and seven percentage points higher than in 2000.¹ However, despite these significant shares and indeed the growing evidence on the effect of migration across OECD economies, little is known about migration in Australia.

In Australia, the design of new migration policies is often subject to public debate. Until the 1970s, migration to Australia was almost entirely limited to European citizens. During this time, the objective of migration policy was to ensure constant population growth. Over recent decades, the focus shifted towards a selective process favouring migrants with skills and qualifications deemed beneficial to the Australian economy. Today, most permanent migrants in Australia are selected based on national and regional labour market demands or via employer-sponsored visas. According to the Australian Bureau of Statistics (ABS), in 2016-2017, migrants generated 112 billion AUD of total personal income, corresponding to 13% of national income.² Currently, the overarching goal of migration policy is to benefit the Australian economy and society.

This paper provides descriptive evidence on the relationship between migration, employment, and productivity in Australian regions. It elaborates on the characteristics and geographic distribution of migrants in Australia and offers an overview of recent trends in regional employment and productivity. Additionally, the analysis benchmarks Australia with other major migrant-receiving OECD countries to identify aspects that make the Australian context unique. Moreover, this paper paves the way for additional research.³

The remainder of the paper is organised as follows. The first section provides a general picture of migration in Australia. The second presents evidence on the employment gap between migrants and native-born. Moreover, it illustrates the interplay between migration and local employment. The third examines the association between the geographic concentration of migrants and regional productivity.

¹ The terms “migrants” and “foreign-born” are used interchangeably throughout this paper. Migrants are defined by place of birth. The migrant population is defined as the population born in a country different from the one of residence. Unlike citizenship, this criterion does not change over time, it is not subject to country differences in legislation and it is thus adequate for international comparisons. Due to data limitations, the paper does not differentiate migrants based on their visa status, country of origin or number of years spent in Australia.

² Information are released by the ABS: [Personal Income of Migrants, Australia, 2016-17 financial year | Australian Bureau of Statistics \(abs.gov.au\)](https://www.abs.gov.au/Personal+Income+of+Migrants+Australia+2016-17+financial+year); [Personal Income in Australia, 2011-12 to 2016-17 | Australian Bureau of Statistics \(abs.gov.au\)](https://www.abs.gov.au/Personal+Income+in+Australia+2011-12+to+2016-17).

³ This paper is the first output of a multi-annual collaboration between the Australian Centre for Population and the OECD. In addition to this paper, the project involves three papers focusing on the role of migration in regional development through an econometric framework.

Box 1. Data

This paper analyses migration in Australia and comparable OECD countries using three geographical levels of analysis. Data at the "Territorial Level 2" (TL2), the "Statistical Areas Level 4" (SA4), and the "Statistical Areas Level 2" (SA2) provide insights from the state and territory level to the granular municipality level. The analysis relies on the OECD Regional Database, the OECD Municipal Migrant Database, and the Australian Census of 2016.

The OECD Regional Dataset provides a large set of statistical indicators related to the characteristics and local labour market integration of migrants and native-born. Such indicators are developed at the scale of the "Territorial Level 2" (TL2) regions across more than 30 OECD countries over two decades. In Australia, the TL2 classification corresponds to states and territories. This also applies to countries like the US (states) or Germany (federal states). This cross-country regional dataset allows for comparisons with other migrant-receiving countries such as Canada, Germany, the UK, and the US. The dataset further provides information on regional productivity (e.g., Gross Value Added (GVA) per worker, Gross Domestic Product (GDP) per capita and regions' industrial decomposition (e.g., employment and GVA by ISIC sector)).

For more granular analysis across Australian "Statistical Areas Level 4" (SA4) regions, this study relies on TableBuilder data sourced from the Census of Population and Housing 2016. The Australian SA4 regions correspond to local labour markets as they build on the commuting patterns of workers.⁴ The data provides information on regional migrant shares, personal income, and employment outcomes, as well as details on the characteristics of the native-born and foreign-born populations at a granular level. Including this dataset adds an important dimension by capturing the local labour market interactions more accurately. It thus complements the analysis across OECD countries at the regional level. Moreover, such granular geographical information is especially relevant in Australia due to the pronounced population density differences even within individual states.

In addition to the TL2 and SA4 analysis, the OECD Municipal Migrant Database (MMD) provides a means to examine geographic and demographic patterns at the municipal level. The MMD provides information on the native-born and foreign-born populations at the granular level across more than 20 OECD countries. The dataset combines data from national resources at the municipality level. In Australia, the database corresponds to "Statistical Areas Level 2" (SA2) regions with an average population of 10 000 inhabitants. The Australian data originates from the Census of Population and Housing and has been adapted to two regional classifications (degree of urbanisation and access to metropolitan areas) (OECD et al., 2021^[1]). The database is used to identify the settlement behaviour of migrants and native-born across different types of metropolitan regions in Australia and other OECD countries.

⁴ For detailed information on Australian geographical units, see [1270.0.55.001 - Australian Statistical Geography Standard \(ASGS\): Volume 1 - Main Structure and Greater Capital City Statistical Areas, July 2016 \(abs.gov.au\)](https://abs.gov.au/1270.0.55.001-Australian-Statistical-Geography-Standard-(ASGS)-Volume-1-Main-Structure-and-Greater-Capital-City-Statistical-Areas).

2 Migration in Australia

This section presents an overview of migration in Australia and comparable OECD countries. First, it discusses the settlement patterns of migrants across countries and regions using different geographic levels. Second, it discusses the characteristics of migrants in terms of their country of origin and educational attainment.

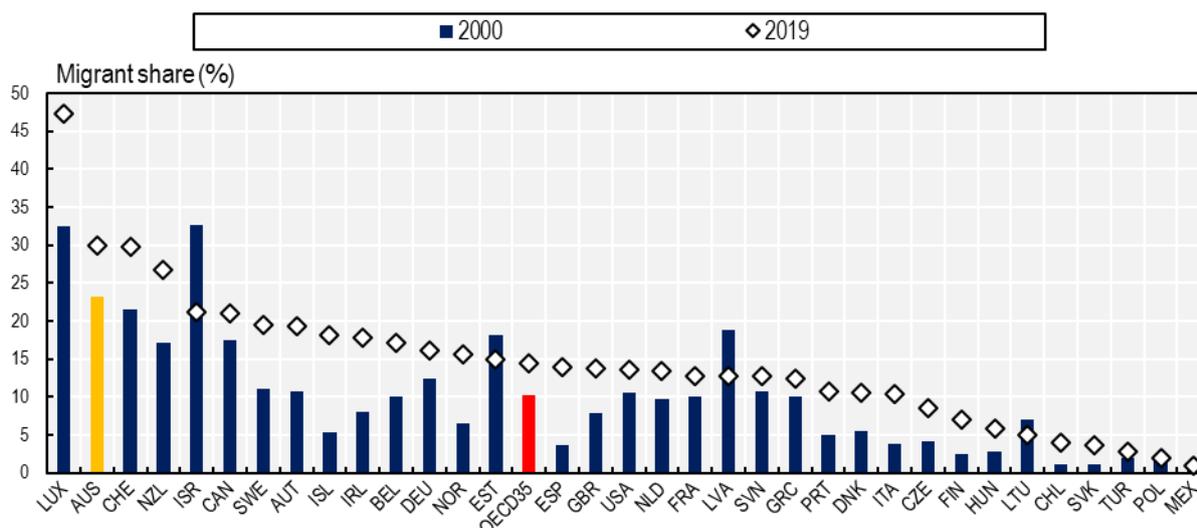
The migrant population in Australian regions

OECD countries differ in the share of migrants among the total population. In 2019, 30% of Australia's population was foreign-born, more than twice the OECD average of 14% (Figure 1). Across OECD countries, only Luxembourg (47%) has a higher migrant share. Other major migrant-receiving OECD countries such as Canada (21%), France (13%), Germany (16%), the UK (14%), or the US (14%) all have significantly smaller migrant population shares than Australia.

In the last two decades, the share of migrants in the total population increased substantially. Across OECD countries with available data, the share of migrants increased by four percentage points, from 10% in 2000 to 14% in 2019 (Figure 1). In the same period, all countries, except Israel, Estonia, and Latvia, reported an increase in their migrant shares. During this time, Australia experienced a significant net inflow of migrants, raising the migrant share in the population from 23% to 30%.

Figure 1. The migrant share in Australia is one of the highest among OECD countries

Share of foreign-born population by country, 2000 and 2019 or latest available year



Note: The figure presents the foreign-born share among the total population. Data are for 2000 and 2019 or the latest available year.

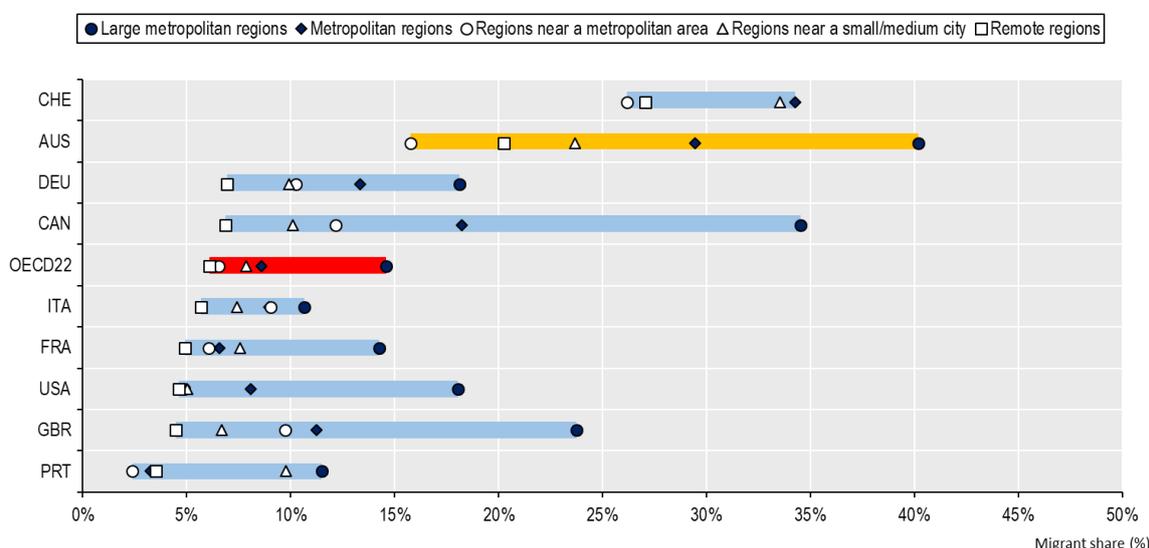
Source: OECD Statistics, <https://data.oecd.org/chart/6Lz5>.

Most migrants in Australia live in metropolitan regions

In most OECD countries, the number of migrants as a share of the total population is highest in metropolitan regions. Figure 2 presents the share of migrants in each type of region (see Box 2). In most countries, migrants often settle disproportionately in cities or regions with dynamic economies that offer better employment opportunities (OECD, 2022^[2]). Additionally, existing migrant networks play a key role for many migrants when choosing where to settle. In Australia, migrants constitute 40% of the total population in large metropolitan regions, i.e., regions that contain a metropolitan area of more than 1.5 million inhabitants, such as greater areas of Brisbane, Melbourne, Perth, and Sydney, while it is only 15% across OECD countries. Similarly, 29% of the population in Australian metropolitan regions, i.e., regions that include a metropolitan area with more than 250 000 inhabitants, is foreign-born, compared to only 9% across OECD countries.

Figure 2. In Australia, the migrant share is highest in metropolitan regions

Share of foreign-born population by type of region, 2022 or latest available year



Note: The figure presents the share of the foreign-born population among the total population (native-born and foreign-born) in TL3 regions classified according to their access to metropolitan areas (Box 2). Data are for 2022 or the latest available year. Data for Australia are for 2016. Data for the UK are limited to England and Wales. The underlying sample covers the entire local resident population.

Source: OECD calculations based on data described in Box 2.

Box 2. Technical information

Classification of small regions by access to metropolitan areas

The OECD metropolitan/non-metropolitan typology for small regions (TL3) helps to assess differences in socio-economic trends in regions – both within and across countries – by controlling for the presence/absence of metropolitan areas and the extent to which the latter are accessible by the population living in each region. The method relies on publicly available grid-level population data and localised information on driving conditions. Accordingly, TL3 regions are classified as metropolitan if more than half of their population lives in a functional urban area (FUA) of at least 250 000 inhabitants and classified as non-metropolitan otherwise. A metropolitan region is classified as a large metropolitan region if the FUA, accounting for more than half of the regional population, has over 1.5 million inhabitants.

Table 1. Overview: Regional classification and access to FUAs

Acronym	Grouping	Macro grouping	Access to FUAs
MR-L	Large metropolitan region	Metro region	50% of population in FUA above 1.5 million inhabitants
MR-M	Metropolitan region	Metro region	50% of population in FUA above 250 000
NM-M	Region near a metropolitan area	Non-metro region	50% of population can reach FUA above 250 000 within an hour
NM-S	Region with/near a small-medium city	Non-metro region	50% of population can reach FUA of 50 000-250 000 within an hour
NM-R	Remote region	Non-metro region	No FUA within an hour for half of the population

Source: OECD (2020), *OECD Regions and Cities at a Glance 2020*, OECD Publishing, Paris; method based on Fadic, M. et al. (2019), "Classifying small (TL3) regions based on metropolitan population, low density and remoteness", *OECD Regional Development Working Papers*, No. 2019/06, OECD Publishing, Paris.

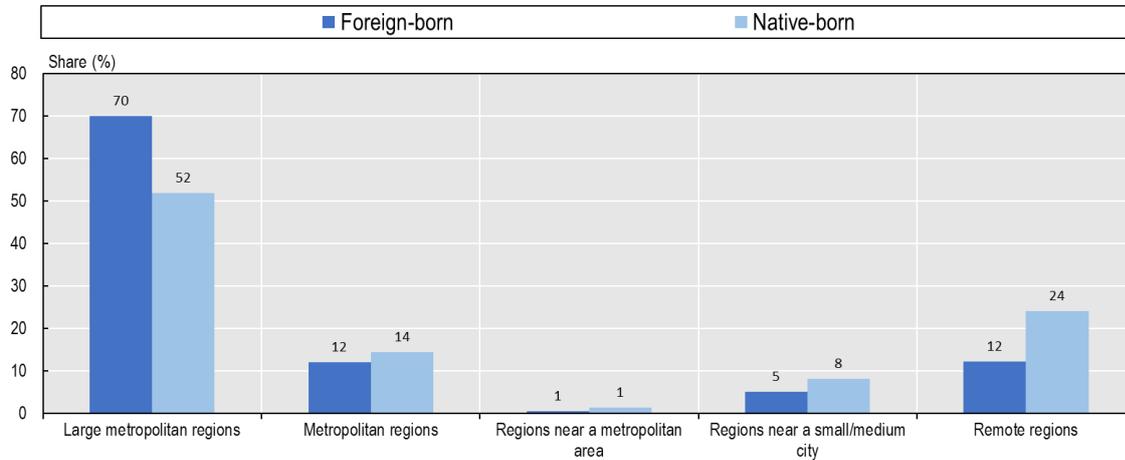
In turn, the typology further classifies non-metropolitan regions based on the size of the FUA that is most accessible to the regional population. More specifically, non-metropolitan TL3 regions are sub-classified into three possible types:

1. With access to a metropolitan area, if at least half of the regional population can reach an FUA of at least 250 000 inhabitants within a 60-minute car ride.
2. With access to a small/medium city, if at least half of the regional population can reach an FUA between 50 000 and 250 000 inhabitants within a 60-minute car ride.
3. Remote, if reaching the closest FUA by car takes more than 60 minutes for more than half of the regional population.

Compared to the native-born population, the migrant population is more likely to settle in large and dense places, where they can benefit from agglomeration advantages and their co-ethnic networks. In Australia, seven out of ten foreign-born live in large metropolitan regions compared to one out of two native-born (Figure 3). In contrast, around one-fifth of the migrant population (18%) reside outside of metropolitan regions, compared to almost one-third (33%) of the native-born. The differences in the settlement patterns of migrants and native-born are particularly striking in remote regions, where the share of the migrant population (12%) is half the share of native-born (24%). Only a small percentage of migrants or native-born live in regions near a metropolitan area due to the unique population settlement patterns in Australia.

Figure 3. Migrants and native-born are concentrated in large metropolitan regions

Distribution of migrants and native-born by type of region, 2022 or latest available year



Note: The figure presents the distribution of foreign-born and native-born across TL3 regions classified according to their access to metropolitan areas (Box 2). Data are for 2022 or the latest available year. Data for Australia are for 2016. Data for the UK are limited to England and Wales. The underlying sample covers the entire local resident population.

Source: OECD calculations based on data described in Box 2.

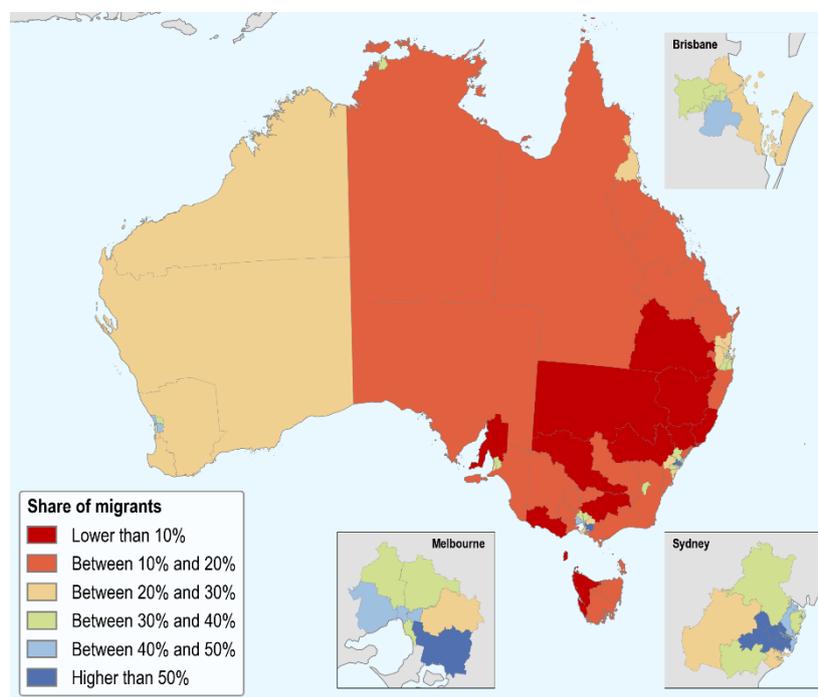
In Australia, the share of migrants among the total population is highest in cities and the western parts of the country. The migrant share in Australian SA4 regions⁵ ranges from around 8% in primarily rural SA4 regions in the southeast (including New South Wales, Victoria, Queensland, South Australia, and Tasmania⁶) to more than 50% in the highly urbanised SA4 regions of Sydney and Melbourne (Figure 4). On the west coast, Perth, on the east coast, Brisbane, Sydney, Canberra, and Melbourne, along with Adelaide in the south and Darwin in the north, report the highest migrant shares.

⁵ The terms “SA4 regions” and “local labour markets” are used interchangeably. Moreover, the term “local” (e.g., local migrant share) refers to SA4 regions, whereas “regional” refers to TL2 regions.

⁶ The Australian states and territories are commonly abbreviated as follows: Australian Capital Territory (ACT), New South Wales (NSW), Northern Territory (NT), Queensland (QLD), South Australia (SA), Tasmania (TAS), Victoria (VIC) Western Australia (WA).

Figure 4. The share of migrants is highest in cities and Western Australia

Share of the foreign-born population across Australian SA4 regions, 2016



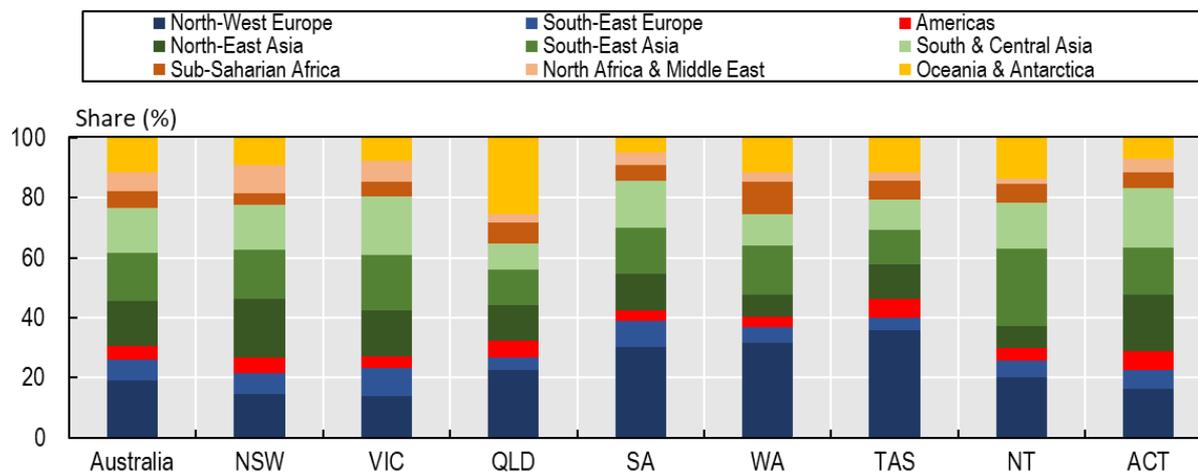
Note: The figure presents the share of foreign-born among the working-age population (15-64 years) in Australia disaggregated by SA4 regions. Data are for 2016.

Source: Australian Census of Population and Housing 2016 accessed via ABS Census TableBuilder (accessed May 2022).

Across Australian states and territories, migrants originating from Asia constitute the largest migrant group. Figure 5 illustrates the decomposition of the migrant population based on their country of birth (in country groupings). In every region, apart from Western Australia and Tasmania, most migrants are Asian-born. In New South Wales, Victoria, and the Australian Capital Territory, migrants from Asia even account for more than 50% of the local migrant population. While migrants from Europe historically dominated the foreign-born population in Australia (OECD, 2003^[3]), their share nowadays varies between 21% in New South Wales and 40% in Tasmania.

Figure 5. Most Australian immigrants are born in Asia or Europe

Distribution of migrants by country of birth across Australian states and territories, 2016



Note: The figure presents the distribution of migrants by country of birth (in country groupings) among the working-age population (15-64 years) in Australia and the individual states and territories. See Footnote 6 for abbreviations of the Australian states and territories. Data are for 2016. Source: Australian Census of Population and Housing 2016 accessed via ABS Census TableBuilder (accessed May 2022).

Migrants in Australia are among the most educated in the OECD

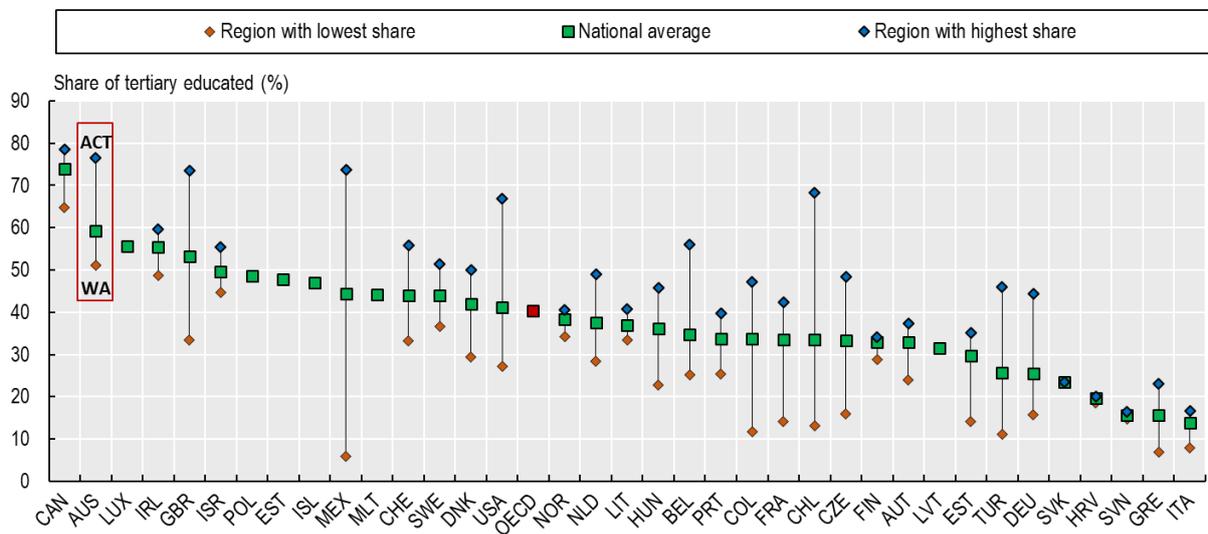
Educational attainment is a crucial factor for the successful integration of migrants into the labour market and their contribution to the economic development of their host region. Migrants with higher levels of education are more productive and therefore have higher wages. In addition to benefitting the individual worker through higher wages, more educated employees also generate positive spillovers for their co-workers or workers around them, creating wider social benefits. Thus, the differences in the education of migrants can affect the extent to which they thrive in the regional labour markets while also contributing to local economic development.

Australia has one of the highest educated migrant populations among OECD countries. Almost 60% of the migrant population in Australia has attained tertiary education, compared to around 40% of migrants in other OECD countries.⁷ Some places are particularly attractive for highly-educated migrants. Within OECD countries, there is, on average, a 22 percentage point difference between the regions with the highest and lowest shares of tertiary-educated migrants (Figure 6). In most countries, economic or administrative capital regions have the highest share of tertiary-educated migrants. This pattern also holds for Australia, where the Australian Capital Territory has the most educated migrant population, with eight out of ten migrants having tertiary education. On the other end of the spectrum, migrants in Western Australia have the lowest education levels in the country, on average, with only one out of two migrants having attained a tertiary education degree. Still, relative to other OECD regions, all Australian regions have high shares of tertiary-educated migrants (Figure 7).

⁷ The population is restricted to those between 25 and 64 years old when comparing educational attainment, as young adults between 15 and 25 might not have completed school or education yet.

Figure 6. Migrants in Australia and Canada are best educated

Share of tertiary-educated foreign-born population, 2019 or latest available year

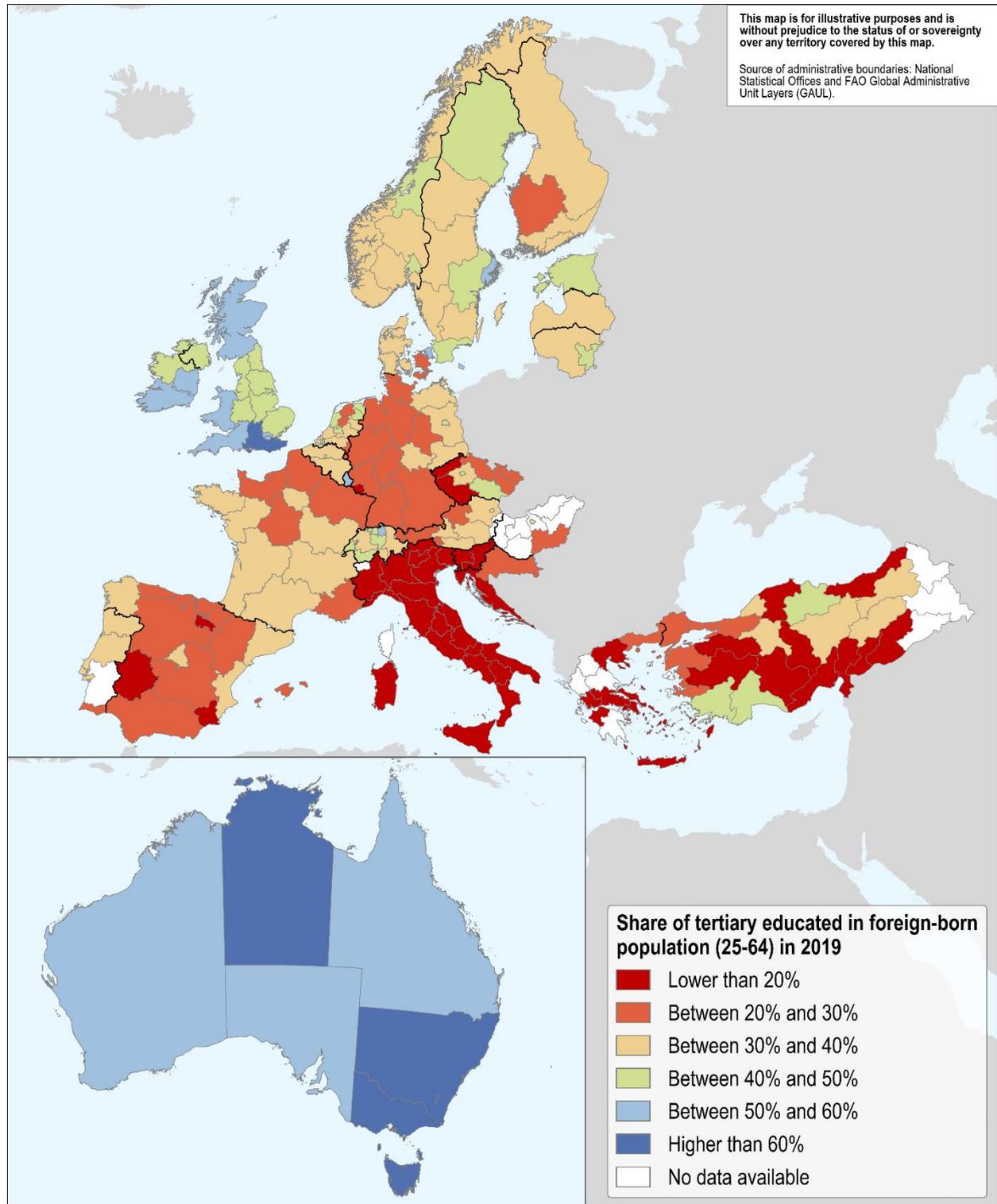


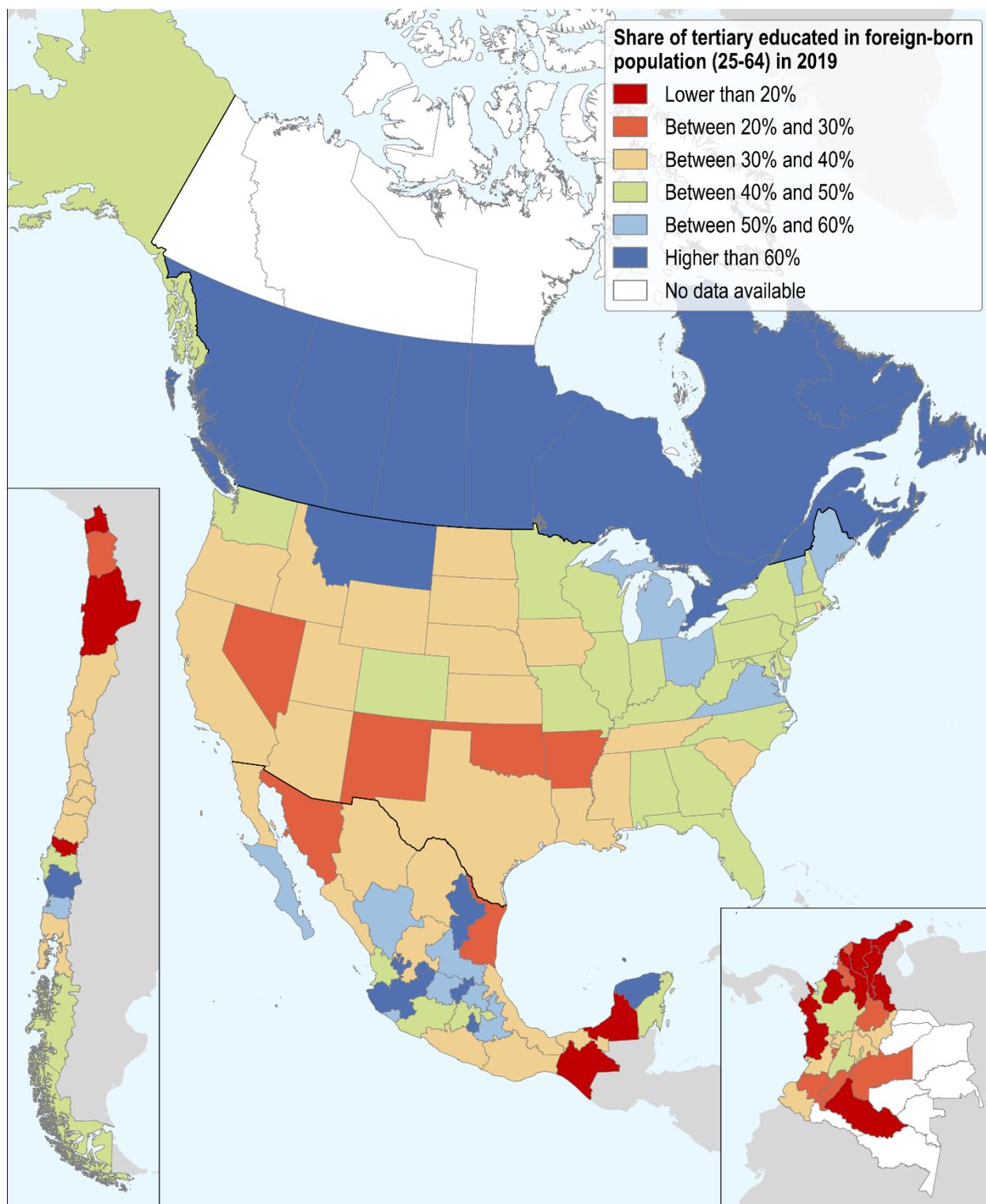
Note: The figure presents the share of tertiary-educated foreign-born among the foreign-born population (25-64). Data are for 2019 or the latest available year.

Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed March 2022).

Figure 7. Educational attainment of migrants across OECD regions

Share of tertiary-educated foreign-born by TL2 regions, 2019





Note: OECD calculations based on labour force surveys.

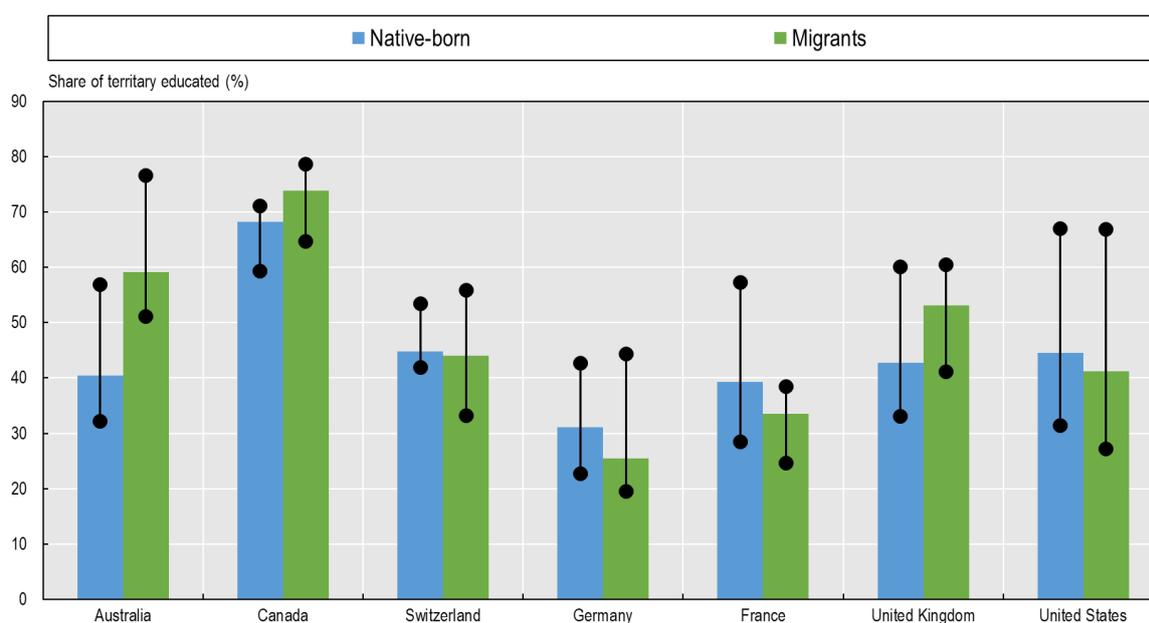
Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed March 2022).

The educational gap between migrants and natives in Australia is larger than in comparable OECD countries

Migrants in Australia are, on average, higher educated than the native-born population. Figure 8 illustrates educational differences in major migrant-receiving OECD countries and shows that the share of tertiary-educated migrants substantially exceeds that of the native-born in Australia, Canada, and the United Kingdom. Moreover, the difference between the shares of tertiary-educated among the native-born and migrant populations is biggest in Australia, with a gap of 20 percentage points. However, the average level of education of migrants is not higher than natives in every OECD country. For instance, migrants have lower educational attainment compared to the native population in continental Europe and the United States.

Figure 8. Migrants are often more educated than their native counterparts

Share of tertiary-educated native-born and foreign-born among group population in TL2 regions, 2019



Note: The figure presents the share of tertiary-educated native-born and migrants among the group population (25-64). The black dots mark the minimum and maximum values at the TL2 level. Data are for 2019.

Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed March 2022).

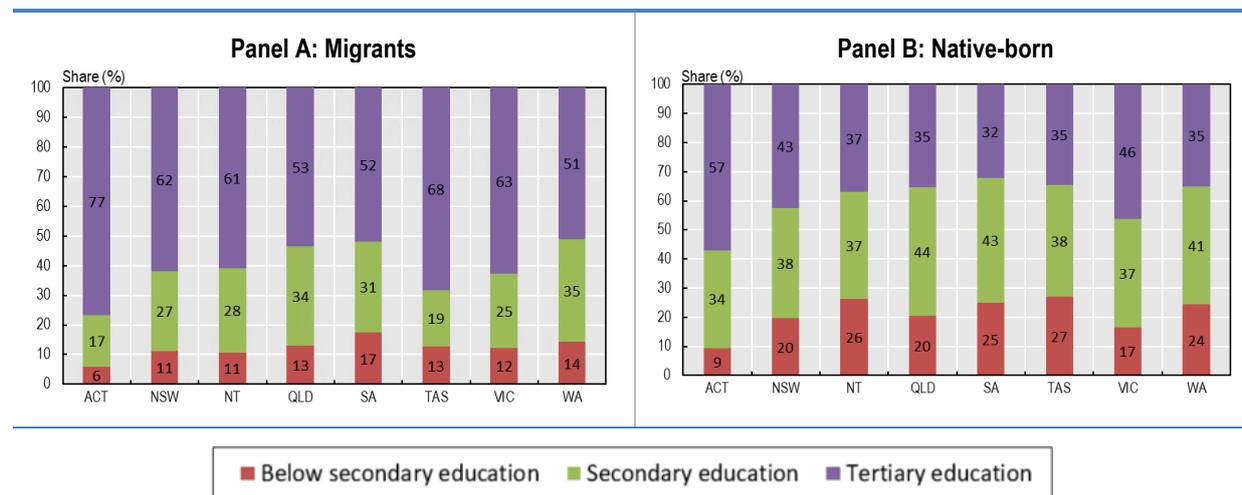
Australian states and territories also mirror the national pattern. In every region, migrants are more likely to have completed tertiary education than native-born (Figure 9). Moreover, migrants are less likely not to have completed secondary education compared to native-born. In fact, 12% of the foreign-born have less than secondary educational attainments, while that share is 20% among the native-born. The share of below secondary-educated native-born is highest in Tasmania (27%) and the Northern Territory (26%) and lowest in the urban Australian Capital Territory (9%). For the migrant population, the share of individuals with below secondary education is highest in South Australia (17%) and lowest in the Australian Capital Territory (6%).

Across the OECD, tertiary-educated migrants tend to settle in regions that are also home to tertiary-educated native-born (OECD, 2022^[21]). These patterns also hold for the Australian states and territories.

For instance, the Australian Capital Territory records the highest share of foreign and native-born with tertiary education, at 77% and 57%, respectively.

Figure 9. Migrants are better educated than natives across all Australian states and territories

Share of tertiary-educated, secondary-educated, and below secondary-educated foreign-born and native-born (25-64 years old), 2019



Note: The figure presents the educational attainment among the foreign-born and native-born populations (25-64), respectively. See Footnote 6 for abbreviations of the Australian states and territories. Data are for 2019.

Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed March 2022).

3 Migrants and local labour markets

Australia's labour market in an international comparison

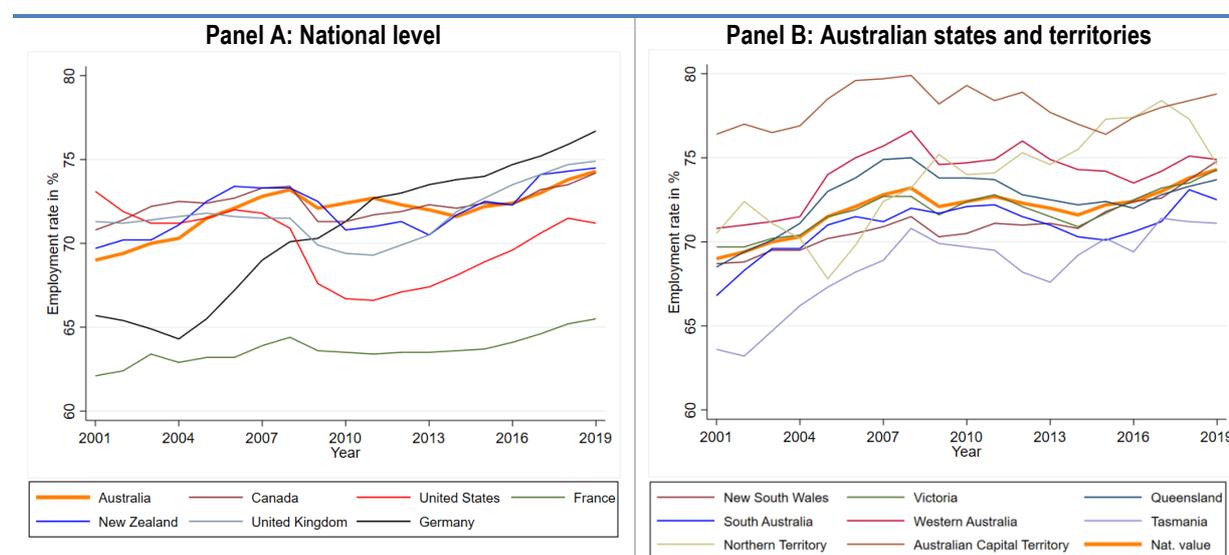
Over the last two decades, the employment rate in Australia increased more than in most comparable OECD countries. Panel A of Figure 10 shows the development of the employment rate between 2001 and 2019 in Australia and OECD countries with similar income levels, migration history and historical ties. Australia's positive employment rate trend was interrupted by the Global Financial Crisis in 2008. Like most other OECD countries, Australia's employment stagnated and fell during the crisis. Since 2015, the Australian employment rate has constantly been growing.

Despite the impact of the Global Financial Crisis, Australia has recorded the highest employment growth over the last two decades among OECD countries after Germany. Between 2001 and 2019, the employment rate among the Australian working-age population (15-64 years) rose by 5.3 percentage points compared to 11 percentage points in Germany or an average of 2.7 percentage points in the other selected OECD countries. During this period, the employment rate increased by 4.8 percentage points in the UK while it decreased by 1.9 percentage points in the United States.

Within Australia, regional differences in the employment rate among Australian states and territories have gradually decreased over the last twenty years (Figure 10, Panel B). Between 2001 and 2019, the gap between the Australian Capital Territory (the best-performing state) and Tasmania (the worst-performing state) narrowed substantially from 12.8 to 7.7 percentage points. This convergence was mainly driven by the positive development in Tasmania, which rose by 7.5 percentage points compared to 2.4 in the Australian Capital Territory.

Figure 10. The Australian employment rate increased more than in most OECD countries

Employment rates across countries (Panel A) and Australian states and territories (Panel B), 2011-2019



Note: The figure presents the total (foreign- and native-born) employment rate among the population (15-64 years). Panel A presents selected OECD countries. Panel B presents Australian states and territories and the national value. Data are for 2001-2019.

Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed June 2022).

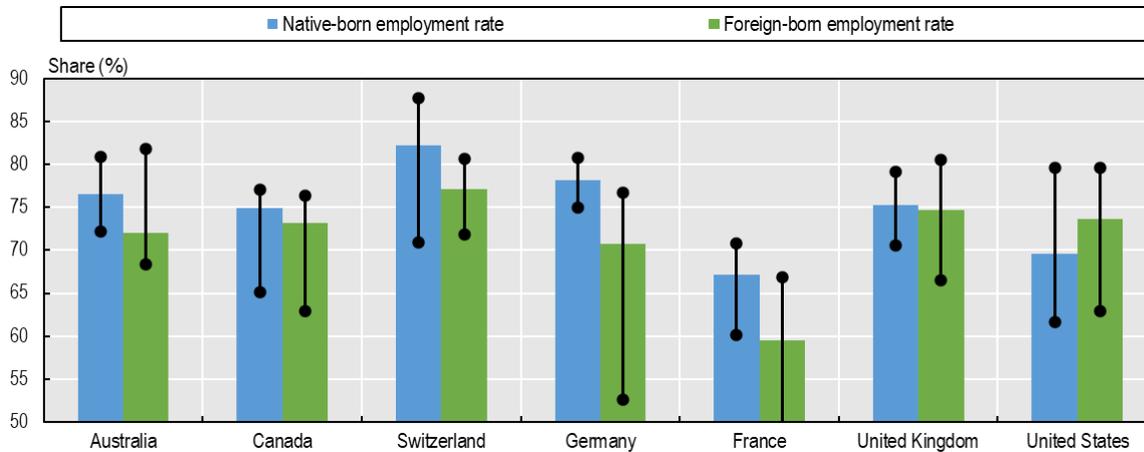
The employment gap between the native-born and migrant populations in Australian regions is mainly driven by significantly lower female employment among migrants

Migrants are equipped with the skills and determination to build a better future for themselves and their families. Their labour market integration is of fundamental importance as it offers economic means while also facilitating their social and cultural integration. However, significant challenges remain in the labour market integration of migrants, with visible geographical variation across and especially within countries.

Despite the progress in the labour market integration of foreign-born in recent years across OECD countries, the employment rates of migrants often lag behind the employment rate of the native population. As Figure 11 shows, the employment rate is higher for native-born than migrants in Australia and all other comparable OECD countries, except for the United States. The gap (between the bars) varies from less than one percentage point in the UK to seven percentage points in Germany. In Australia, the employment rate of migrants is 72%, four percentage points lower than that of the native-born population. The employment rates of migrants and native-born at the regional level (i.e., black dots) also differ substantially relative to the national averages (i.e., the bars), driven by many country-specific factors (OECD, 2022^[2]).

Figure 11. Native-born are more likely to be employed than foreign-born across OECD countries

Share of employed native-born and foreign-born in TL2 regions, 2019 or latest available year



Note: The figure presents the employment rate at the national level among foreign-born and native-born working-age populations (15-64 years) separately. The dots mark the minimum and maximum values at the TL2 level. Data are for 2019 or the latest available year.

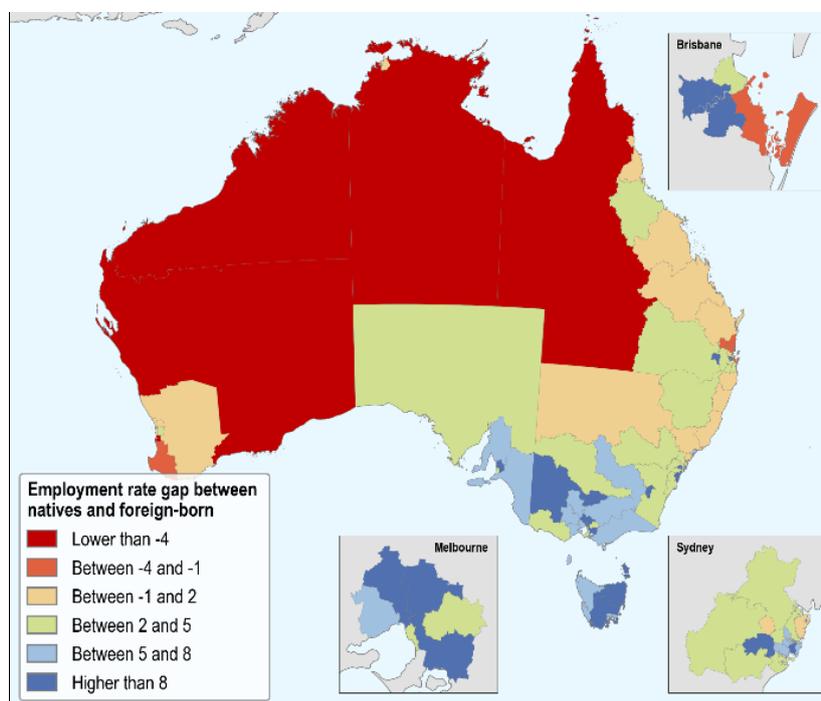
Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed March 2022).

In most Australian regions, migrants are less likely to be employed compared to native-born. The employment gap is especially striking in the southeast of Australia and the large urban centres (Figure 12). Several cities, such as Adelaide, Melbourne, and Sydney, record an employment gap above ten percentage points, with the highest value in Inner Melbourne (17 percentage points).⁸ In only one out of five SA4 regions, employment rates are actually higher for migrant workers compared to native-born. Such regions are mainly located in the rural areas of Western Australia, the Northern Territory, and Queensland.

⁸ Populous cities are disaggregated into different SA4 regions.

Figure 12. The native-migrant-employment gap follows geographical patterns

Employment gap between native-born and migrants, SA4 regions, 2016



Note: The figure presents the percentage point difference in the employment rate of native-born and foreign-born among the working-age population (15-64 years) in Australia disaggregated by SA4 regions. A positive value indicates a higher employment rate among the native-born. Data are for 2016.

Source: Australian Census of Population and Housing 2016 accessed via ABS Census TableBuilder (accessed January 2022).

Uneven employment rates among women seem to explain why migrants report a lower employment rate compared to the native-born population. As in most other OECD countries, the difference in the employment rate between native-born and migrants is significantly larger for women than for men (OECD, 2022^[21]). Figure 13 presents the employment gaps of females (Panel A) and males (Panel B) separately using the same scale. First, employment gaps for both gender groups follow a similar spatial pattern. Second, in all SA4 regions apart from the Wheat Belt in the south of Western Australia and the Outback in Queensland, the employment gap is more pronounced for women than men. In 2019, at the national level, the native-migrant gap for males lies at an almost negligible level of 0.5 percentage points, whereas the difference in the employment rate of migrant females was more than eight percentage points less than native-born females.

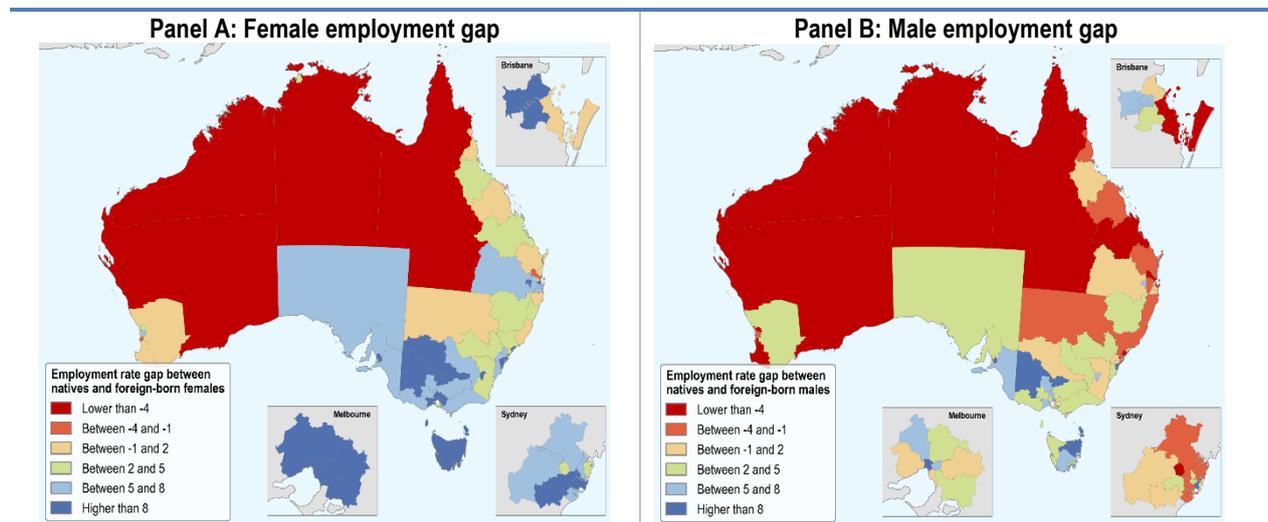
Relatively low labour force participation, rather than higher unemployment, mainly explains the gap in employment rates between female migrants and native-born. In Australia, over the last decade, the labour force participation rate of migrant women ranged between 66% and 69%, whereas the participation rate of native women ranged between 73% and 77%. Between 2011 and 2020, the average gap between the participation rate of native and foreign women was 7.4 percentage points. Differences in the unemployment rate are more moderate, ranging from less than one percentage point to two percentage points. Figure A B.1 in Annex B presents the participation and unemployment rate for native-born and migrants by gender.

Box 3. What drives the employment gap?

The unemployment and labour force participation rates are two useful indicators to understand the employment gap and its underlying mechanisms. The employment rate is comprised of the unemployment rate and labour force participation rate. The unemployment rate measures the percentage of unemployed individuals searching for a job relative to labour market participants. However, individuals who are neither employed nor unemployed are not considered part of the labour force.⁹ The labour force participation rate indicates the percentage of individuals who are either employed workers or unemployed individuals searching for a job, hence actively participating in the labour market. Positive gaps in employment rates between natives and migrants can come from either higher unemployment rates of migrants or lower participation rates of migrants, or both.

Figure 13. The female native-migrant employment gap is larger than the male native-migrant gap

Employment gap between native-born and migrants by gender, SA4 regions, 2016



Note: The figure presents the percentage point difference in the employment rate of native-born and foreign-born among the working-age population (15-64 years) in Australia disaggregated by SA4. A positive value indicates a higher employment rate among the native-born. Panel A presents the female working-age population. Panel B presents the male working-age population. Data are for 2016.

Source: Australian Census of Population and Housing 2016 accessed via ABS Census TableBuilder (accessed January 2022).

The employment gap varies across education groups

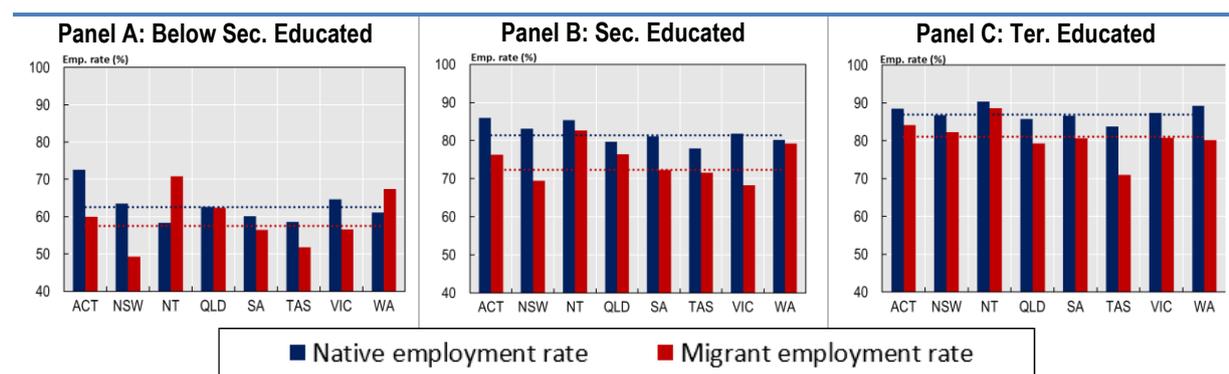
Migrants are less likely to be employed than native-born with similar education in Australia. While the native employment rate exceeds the migrant employment rate at the national level, the magnitude of the employment gap varies depending on the education level (Figure 14). The native-migrant employment gap is strongest among workers with secondary education, as medium-level degrees are typically not easily transferable across borders. The employment gap (distance between dotted lines) amounts to nine percentage points, almost twice the gap among the below secondary-educated (5 percentage points) and more than three percentage points above the gap among the tertiary-educated population. In all states,

⁹ The share only considers the working-age population. In the numerator, employed and unemployed individuals are considered.

the employment rate among individuals with secondary or tertiary education is higher for native-born than migrants. However, the picture is somewhat different for workers with less than secondary education. In the mining states of Northern Territory and Western Australia, migrants with below secondary education are more likely to be employed than native-born with the same educational level.

Figure 14. The employment gap remains in all educational groups

Native-born and migrant employment rate by educational attainment in Australian states and territories, 2019



Note: The figure presents the native and migrant employment rate among the population (25-64) by educational attainment. Data are for 2019. See Footnote 6 for abbreviations of the Australian states and territories.

Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed March 2022).

To sum up, the analysis in this section shows that significant differences exist in the labour market integration of migrants and native-born across Australian regions. Similar to most OECD countries, migrants are substantially less likely to work in all parts of Australia. While employment rates for males are roughly similar for both the native-born and migrants, substantial differences exist for women. Migrant women have also significantly lower participation rates in the labour market compared to their native-born counterparts.

Although migrants in Australia are considerably more educated than the native-born, this does not translate into better labour market outcomes. Many factors can drive the employment gap between native-born and migrants. For example, evidence from OECD countries show that individuals' education, including linguistic, numerical, and digital skills, plays a key role in their success in the labour market. Compared to other regions, employment gaps tend to be higher in European regions where education levels among native-born are significantly higher than among migrants (Grubanove-Boskovic, Natale and Scipioni, 2017^[4]). In Australia, employment gaps between native- and foreign-born population must be driven by other factors, as migrants tend to have higher levels of education than native-born. Moreover, migrants often struggle to find jobs that match their level of qualification. In many OECD countries, migrants often face hurdles in recognition of their foreign qualifications and professional skills (OECD, 2017^[5]). Such institutional barriers may discourage labour force participation, as they make the job search more challenging for migrants while increasing the probability of being overqualified for a job, i.e., having an education or qualification that exceeds the standard requirements of one's job (OECD, 2019^[6]). Overall, the evidence on the disconnect between education and labour market outcomes suggests that better economic integration of migrants might harness the economic potential for the Australian economy.

How do migrants affect local labour markets?

This section discusses the labour market integration of migrants and the potential impact of migration on local employment of natives. The successful labour market integration of migrants depends on various factors, including local characteristics of the labour markets, the education levels of migrants, or the national legal framework. The existing academic evidence suggests that the entry of migrants into the labour markets can affect native employment positively or negatively. Moreover, the labour market effects of migration observed in the short run may also disappear in the long run as labour markets adjust. Finally, workers with different levels of education or occupation might be unevenly affected by migration.

The labour market effect of migration differs across workers and time

According to standard economic models, migration affects the labour market by increasing both the demand and supply of labour. An increase in the labour supply due to migration may put pressure on the employment of natives with similar skills due to substitution effects (Edo and Özgüzel, 2023^[7]). However, migration can also boost native employment by increasing labour demand through local consumption in parallel (Howard, 2020^[8]). Moreover, migrants can further increase native employment if natives and migrants complement each other. For example, Peri and Sparber (2009^[9]) show for the United States that migrants specialise in manual-intensive jobs for which they have comparative advantages, while natives with a similar level of education pursue jobs with more communication-intensive tasks which are better paid and more suited to their skills.¹⁰

Migrants can also affect wages through their contribution to productivity, trade, and innovation in receiving economies. Migrants, particularly highly skilled workers, can bring new ideas to their host country and foster local innovation and productivity. Similarly, they can help their host country establish new trade networks and promote trade. These effects on innovation and trade are expected to positively impact the productivity and, therefore, wages of all workers, dampening the initial labour market effects of immigration.

Labour market effects of migrants can be uneven across genders. Migration may change the gender composition of the local workforce and therefore affect one group more than the other. For example, if migration increases the share of men in the labour force, then native men, who are more likely to be employed in similar sectors requiring similar skills (e.g., construction requiring physical force), can be expected to face stronger competition in the labour market. However, the relationship may also be more complex. For example, an increase in low-skilled migrants can increase the number of people employed in household services (e.g., children or elderly care), which lowers the cost of these services. By increasing the supply of care services, migrants reduce their costs and make them more accessible. Consequently, native women who are able to access affordable care services are able to participate in the labour market (Cortés and Tessada, 2011^[10]).

The relationship between migration and employment can also change over time. Migration may have larger effects on native employment in the short run as the economy cannot adjust quickly to the increase in the labour supply due to rigidities in the labour markets or capital stock. In the longer run, as labour markets adapt to the increase in the labour supply through reallocation of capital and increased investment, the labour market effects get weaker or disappear completely (Edo and Özgüzel, 2023^[7]).

¹⁰ Overall, evidence from OECD countries indicate that adverse labour market effects are concentrated on lower educated native-born workers, as they are more likely to compete with migrant workers, while they are negligible for higher educated native-born (secondary education and above) who are more likely to benefit from skills complementarity (Dustmann, Schönberg and Stuhler, 2016^[11]).

Regions with higher native employment rates are more attractive to migrants

OECD regions with larger migrant populations also have higher native and migrant employment rates. The scatterplots in Figure 15 visualise the relationship between the regional migrant share and native employment rate (Figure 15, Panel A) or migrant employment rate (Figure 15, Panel B) across migrant-receiving OECD countries.¹¹ The orange trend lines show that regions with a larger migrant share (horizontal axis) also have higher employment rates (vertical axis) for native-born (Figure 15, Panel A) and migrants (Figure 15, Panel B). The slope of the trendline in Panel A indicates that OECD regions with a one percentage point higher migrant share (e.g., 15% to 16%), on average, have a 0.19 percentage points higher native employment rate. Similarly, a one percentage point higher migrant share is associated with a 0.27 percentage points higher employment rate for migrants (Panel B).

A more granular look at the linear correlation between migration and local employment allows understanding of regional differences at the local level better and delivers a more nuanced view. While cross-country analysis can be helpful for observing patterns across OECD regions, it can also come with the cost of using larger geographical units, which may mask important heterogeneities within these regions.¹² Such concerns may even be more pronounced in Australia, where the federal states are particularly large, and migrants concentrate in a few urban agglomerations located in the southeast, which also have the highest employment rates in the country (Figure 16). To provide relevant insights into the Australian local context and compare the findings at the TL2 level, the analysis is further deduced at the local labour market level.

Box 4. What can one learn from scatterplots?

Scatterplots are frequently used to visualise linear relationships and correlations. The scatterplots in this section aim to present the association between regional and local employment rates (y-axis) and the migrant share (x-axis). To enrich the analysis, different subgroups are considered.

The correlation between two variables is displayed by a trend line, which informs about the linear relationship (positive or negative) between both variables and the strength of this linear relationship (i.e., the slope).

Geographical units may have different population sizes. To ensure that the estimated linear relationship reflects the differences in the population sizes across geographical units, the trend line is calculated by taking into account the local population (i.e., the total population in each local area is used as weights).

Finally, while trend lines inform about the linear relationship between two variables, these relationships do not imply causality and should therefore be interpreted carefully.

Overall, positive correlations between the migrant share and the native employment are also observed across Australian SA4 regions (Figure 15, Panel C), although the positive relationship disappears for the migrant employment rate (Figure 15, Panel D). The positive correlation between the migrant share and native employment across the Australian SA4 regions (Figure 15, Panel C) is substantially smaller than across the OECD (Figure 15, Panel A).

¹¹ See Annex B for details on the data and countries.

¹² Smaller geographical units can better capture spatial differences across labour markets. For instance, these geographical units allow differentiating urban state capitals and less dense areas within large Australian states and territories.

The correlation should not be causally interpreted, as migrants do not randomly settle across regions. Depending on their visa class and law enforcement, migrants potentially select their residences and move into areas with better labour market opportunities and economic conditions.¹³ Thus, the "endogenous sorting" of migrants across SA4 regions creates a positive correlation between migration and native employment, which can partially explain the positive correlation observed in the figures. Still, the remaining positive relationship observed between migration and native employment is potentially driven by the mechanisms discussed above and could apply in Australia as migrants complement native workers. However, the identification of the causal relationships between migrant shares and employment outcomes would require different data and the implementation of an identification strategy.

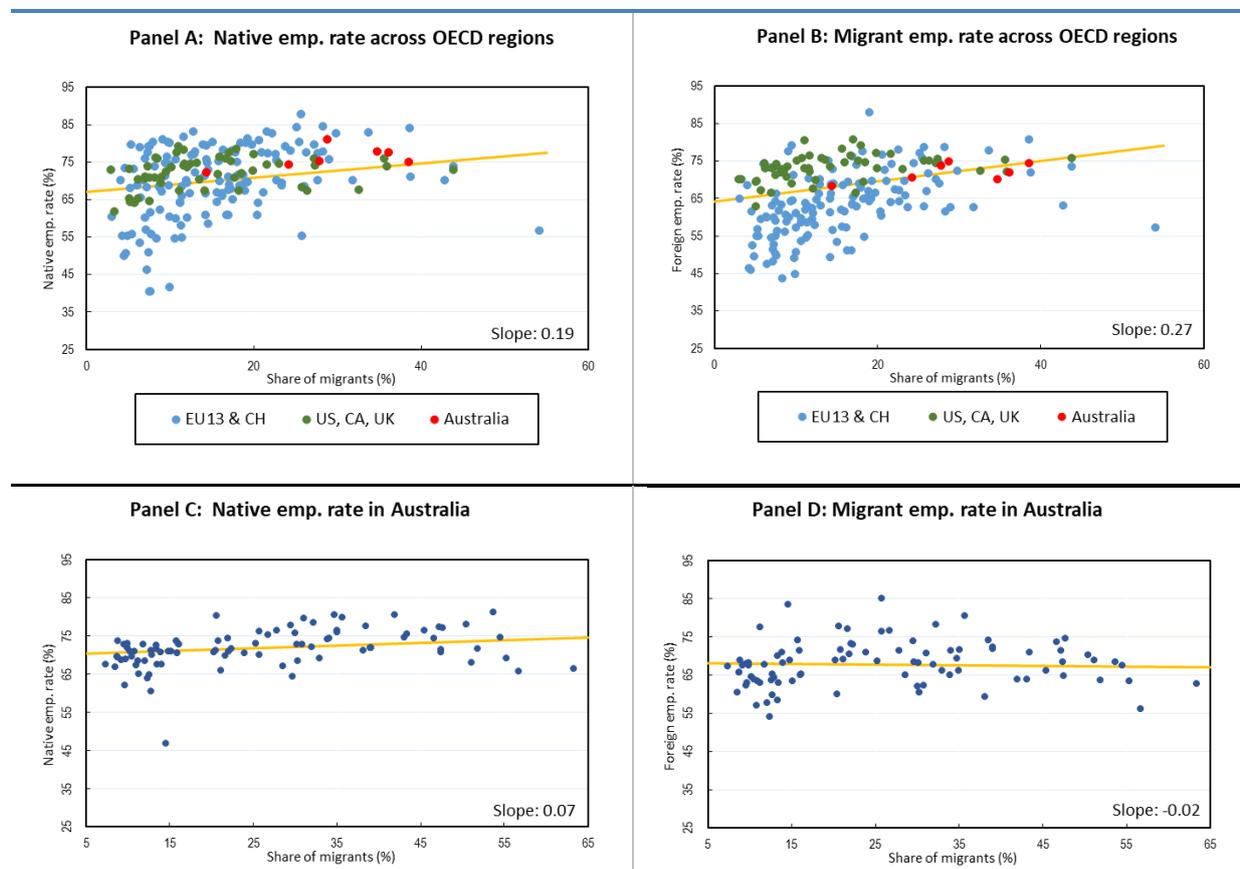
Considering the migrant employment rate, the observed correlations suggest that the entry of new migrant workers into the labour market is not associated with a higher overall migrant employment rate. While a higher share of migrants in Australia's local labour markets is associated with a higher employment rate for the native-born, such a positive relationship does not exist for migrant employment. The flat slope line suggests that newly arriving migrants do not increase the employment rate of migrants by generating positive spillovers, as in the case of the native-born.

While many factors can be driving these employment dynamics, one potential explanation is the high similarity between migrant cohorts (in terms of qualification, specification, and language proficiency). The literature suggests that when the skills of migrants are complementary to those of natives, both groups experience increased productivity, leading to higher wages and employment (Dustmann, Schönberg and Stuhler, 2016^[11]). As newly arrived migrants and pre-existing "migrants" have higher similarities in terms of skills, such positive synergies may not materialise (Özgüzel, 2021^[12]). Another potential explanation is that the arrival of migrants may push natives to specialise in communication-intensive occupations to avoid competition (Peri and Sparber, 2009^[9]). As natives and migrants specialise in different occupations and tasks, they increase productivity and employment.

¹³ Regional visas holders are obliged to remain resident of the initially assigned region/area for a minimum of two years after arrival. However, the movement restriction is rarely enforced and migrants often relocate shortly upon arrival. In contrast, mobility rates are substantially lower for employer-sponsored visas, in which the visa is directly linked and dependent on the employer (OECD, 2018^[19]).

Figure 15. Positive association between migration and native employment

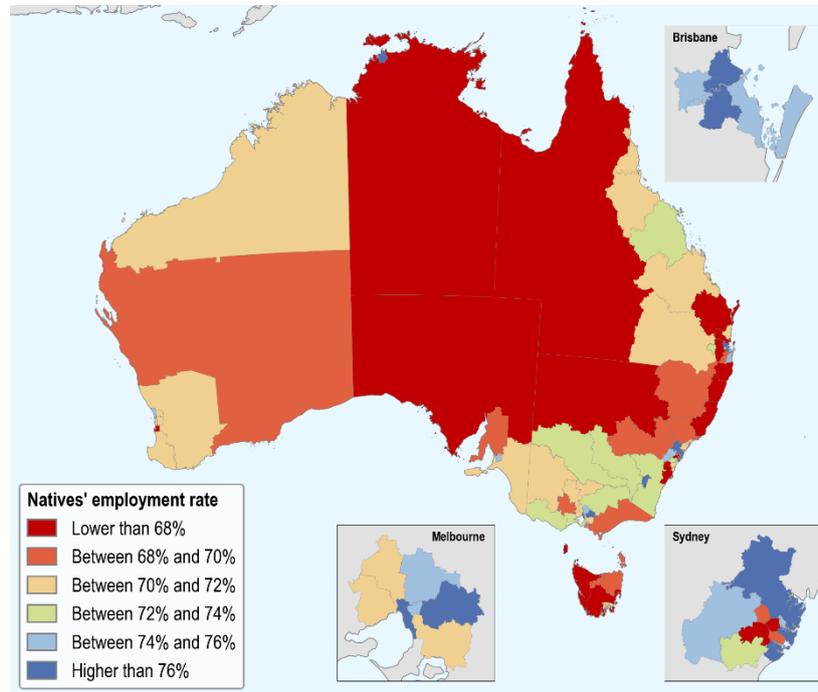
Correlation between the share of migrants and native employment rate or migrant employment rate, respectively, across OECD regions (TL2) and Australian local labour markets (SA4), 2019



Note: Panel A and B: Figures plot the correlation between the share of migrants in the region (horizontal axis) and the native employment rate (Panel A) or the migrant employment rate (Panel B), respectively. Northern Territory (AUS) and Corsica (FR) are excluded. Data are for 2019. Dots correspond to TL2 regions. Panel C and D: Figures plot the correlation between the share of migrants in the region (horizontal axis) and the native employment rate (Panel C) or the migrant employment rate (Panel D), respectively. Data are for 2016. Dots correspond to SA4 regions. The trendline represents the correlation across the full sample. The note on the bottom right corner of each individual figure indicates the estimated correlation (i.e., the slope of the trendline) of the full sample. All estimated correlations are weighted by the total population size. Source: Panel A and B: OECD calculations based on data from OECD Regional Statistics (database) (accessed March 2022). Panel C and D: Australian Census of Population and Housing 2016 accessed via ABS Census TableBuilder (accessed January 2022).

Figure 16. Native employment is highest in metropolitan areas

Native employment rate, SA4 regions, 2016



Note: The figure presents the native employment rate in Australia disaggregated by SA4 regions (local labour markets). Data are for 2016. Source: Australian Census of Population and Housing 2016 accessed via ABS Census TableBuilder (accessed March 2022).

Among OECD regions, the positive correlation between the share of migrants and the native employment rate is significantly stronger for less-educated natives

In Australia and other OECD countries, the correlation between the share of migrants and the native employment rate is positive for natives of all education levels. The trendlines in the scatterplots (Figure 17, Panels A and B) suggest that OECD regions with a one percentage point higher migrant share have a 0.34 percentage points higher employment rate for below tertiary educated native-born while just a 0.17 percentage points higher rate for tertiary-educated native-born. The positive correlation is weaker in Australia for both education groups (Figure 17, Panels C and D). Across Australia's local areas, the correlation for below tertiary educated native-born (0.1) is marginally higher than for tertiary educated native-born (0.08).

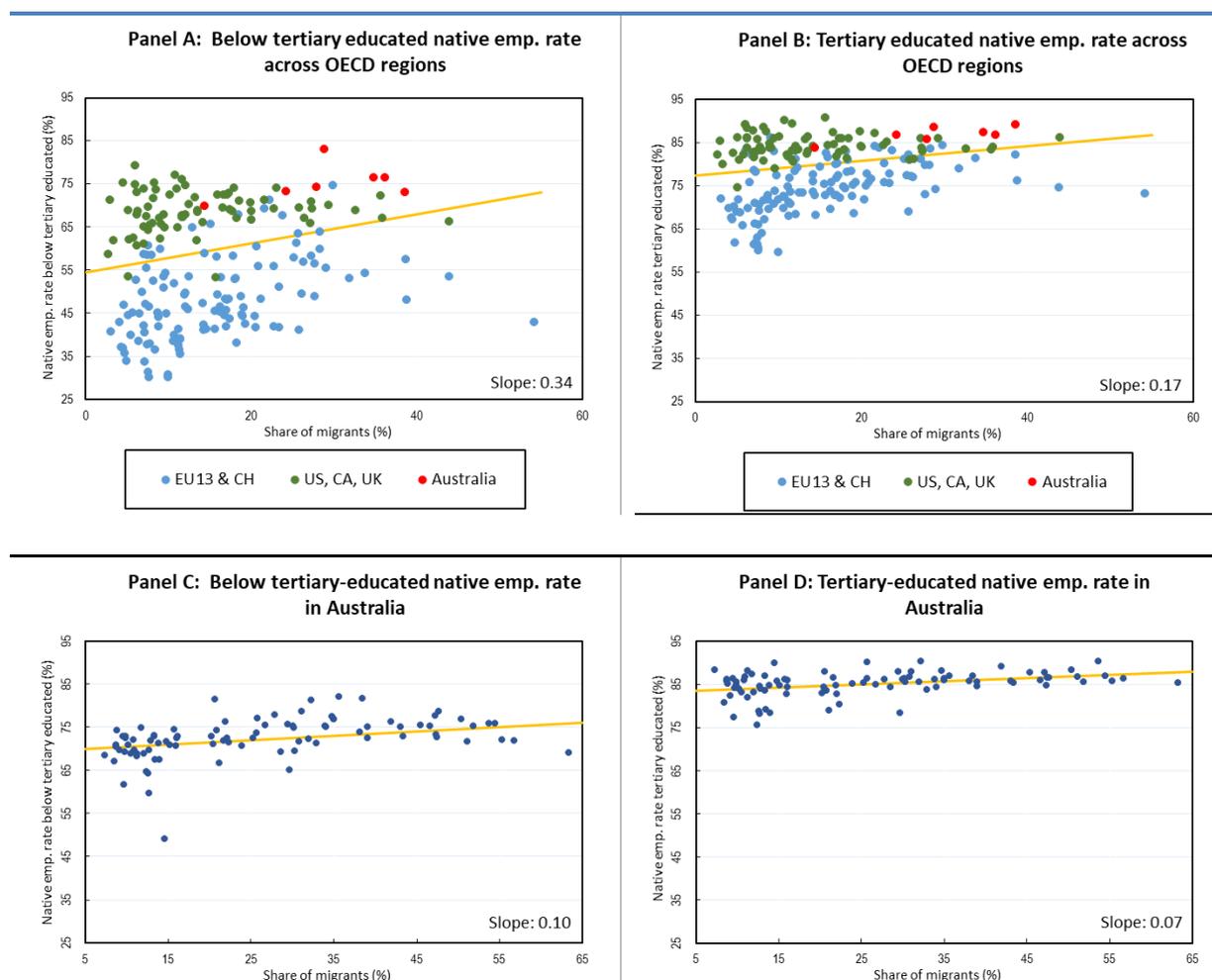
While the correlation cannot be interpreted causally, it suggests that migration may have an uneven effect on natives with different educational levels among OECD regions. The positive correlation between migration and employment of below tertiary-educated native-born is substantially stronger than tertiary educated natives. The difference between the slope for tertiary and below tertiary educated natives is less emphasised and statistically insignificant in Australia.

While the uneven effect of migration on natives with different educational levels can be due to many factors, the relatively large share of high educated workers among migrants might be an important driver. More concretely, given the education composition of migrants in Australia, a rise in the share of migrants in a region means a relatively bigger increase in the labour supply of high educated workers. Naturally, an increase in the supply of high educated migrants would be more beneficial for less-educated natives who would benefit from skill complementarities, while the effect is less clear for high educated natives who

might be competing for the same jobs. Although suggestive, this could indicate a more intense competition between migrants and tertiary educated native workers.

Figure 17. Stronger positive correlation for less-educated natives

Correlation between the share of migrants and below-tertiary-educated native employment rate or tertiary-educated native employment rate, respectively, across OECD regions (TL2) and Australian local labour markets (SA4), 2019



Note: Panel A and B: Figures plot the correlation between the share of migrants in the region (horizontal axis) and the below tertiary educated native employment rate (Panel A) or the tertiary educated native employment rate (Panel B), respectively. Northern Territory (AUS) and Corsica (FR) are excluded. Data are for 2019. Dots correspond to TL2 regions. Panel C and D: Figures plot the correlation between the share of migrants in the region (horizontal axis) and the below tertiary educated native employment rate (Panel C) or the tertiary educated native employment rate (Panel D), respectively. Data are for 2016. Dots correspond to SA4 regions. The trendline represents the correlation across the full sample. The note on the bottom right corner of each individual figure indicates the estimated correlation (i.e., the slope of the trendline) of the full sample. All estimated correlations are weighted by the total population size.

Source: Panel A and B: OECD calculations based on data from OECD Regional Statistics (database) (accessed March 2022). Panel C and D: Australian Census of Population and Housing 2016 accessed via ABS Census TableBuilder (accessed January 2022).

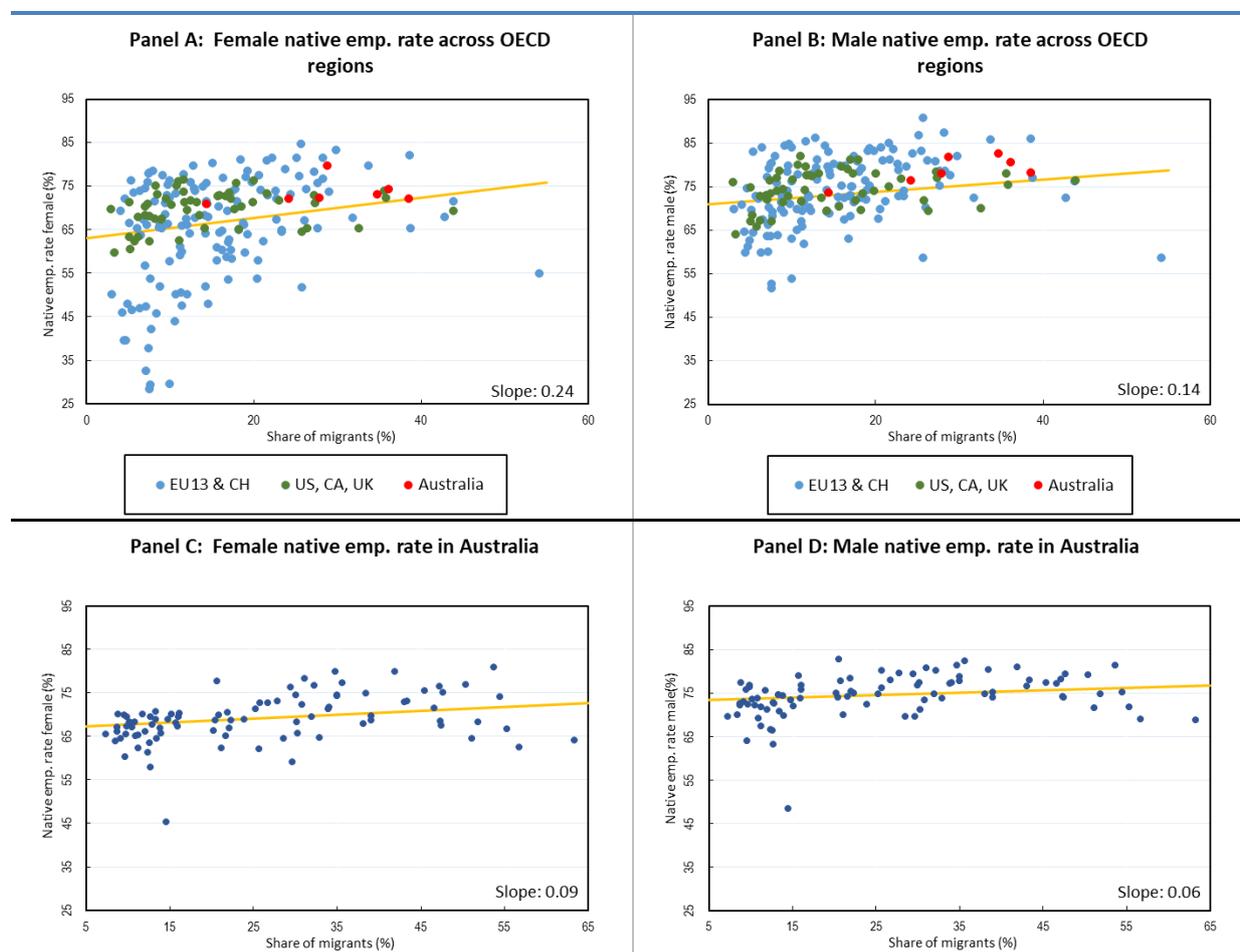
Across regions in Australia and other OECD countries, the positive correlation between the share of migrants and native-born employment rates is stronger for women than for men

Across OECD and Australian regions, the relationship between the migrant share and the employment rate of native men and women is positive, particularly for females (Figure 18). As Panel A and B (Figure 18) illustrate, OECD regions with a one percentage point higher migrant share, on average, have a 0.24 percentage points higher native employment rate for women, yet only a 0.14 percentage points higher employment rate for men. In Australia (Figure 18, Panel C and D), the correlation for both groups, women, and men, is more modest, with a slightly higher estimated correlation for women (0.09) compared to men (0.06).

The correlations suggest that female and male employment rates might react differently to an increase in the migrant population. While the correlation does not allow for causal statements, the variation in the correlation might indicate that migration affects native women more positively than men, as the slopes presenting the association between the share of migrants and the female employment rate (Panels A and C) are steeper than those for male employment rate (Panels B and D).

Figure 18. Uneven correlation between male and female native employment

Correlation between the share of migrants and female native employment rate or male native employment rate, respectively, across OECD regions (TL2) and Australian local labour markets (SA4)



Note: Panel A and B: Figures plot the correlation between the share of migrants in the region (horizontal axis) and the female native employment rate (Panel A) or the male employment rate (Panel B), respectively. Northern Territory (AUS) and Corsica (FR) are excluded. Data are for 2019. Dots correspond to TL2 regions. Panel C and D: Figures plot the correlation between the share of migrants in the region (horizontal axis) and the female native employment rate (Panel C) or the male native employment rate (Panel D), respectively. Data are for 2016. Dots correspond to SA4 regions. The trendline represents the correlation across the full sample. The note on the bottom right corner of each individual figure indicates the estimated correlation (i.e., the slope of the trendline) of the full sample. All estimated correlations are weighted by the total population size.

Source: Panel A and B: OECD calculations based on data from OECD Regional Statistics (database) (accessed March 2022). Panel C and D: Australian Census of Population and Housing 2016 accessed via ABS Census TableBuilder (accessed January 2022).

Heterogeneity in the correlation indicates that specific subgroups of the native population might be more affected by an increase in the migrant population than others. Generally, the descriptive analysis of the interaction of migration and employment shows that across the OECD and Australia, regions with higher employment rates also host relatively more migrants. Moreover, some groups of workers (e.g., women or less educated) are affected more than others.

Causal evidence on the impact of migration on native employment requires better data and rigorous econometric methods. While the scatterplots in the section illustrate a positive correlation between migration and employment, they are partially driven by the fact that migrants tend to locate in economically dynamic areas which offer better employment opportunities. Data spanning over multiple years and a solid identification strategy would allow to unveil the causal interaction and to provide evidence on the uneven effects on different population subgroups.

4 Migrants and local productivity

Labour productivity in Australia and across major OECD countries

The previous section looked at the relationship between migration and employment. As a next step, this section examines the relationship between migration and labour productivity which is one of the most important drivers of long-term economic growth. It reflects an economy's ability to produce more output by better combining its existing resources, developing new ideas, and improving business practices. Increasing labour productivity is crucial for raising output and living standards in the long term. Likewise, large differences in labour productivity across countries play a key role in explaining the differences in per capita income.

Between 2004 and 2020, labour productivity in Australia grew faster than in other OECD economies. During this period, Australia's productivity, measured in GVA per worker, grew, on average, by 0.7% annually. This is the highest growth in the sample except for the US, which annually increased its GVA p.w. by 1.3% (Figure 19, Panel A). Unlike many other OECD countries (e.g., France and Germany), Australia did not experience a decrease or stagnation in labour productivity following the Global Financial Crisis in 2008. Except for a few setbacks, labour productivity in Australia continuously rose throughout those 16 years.

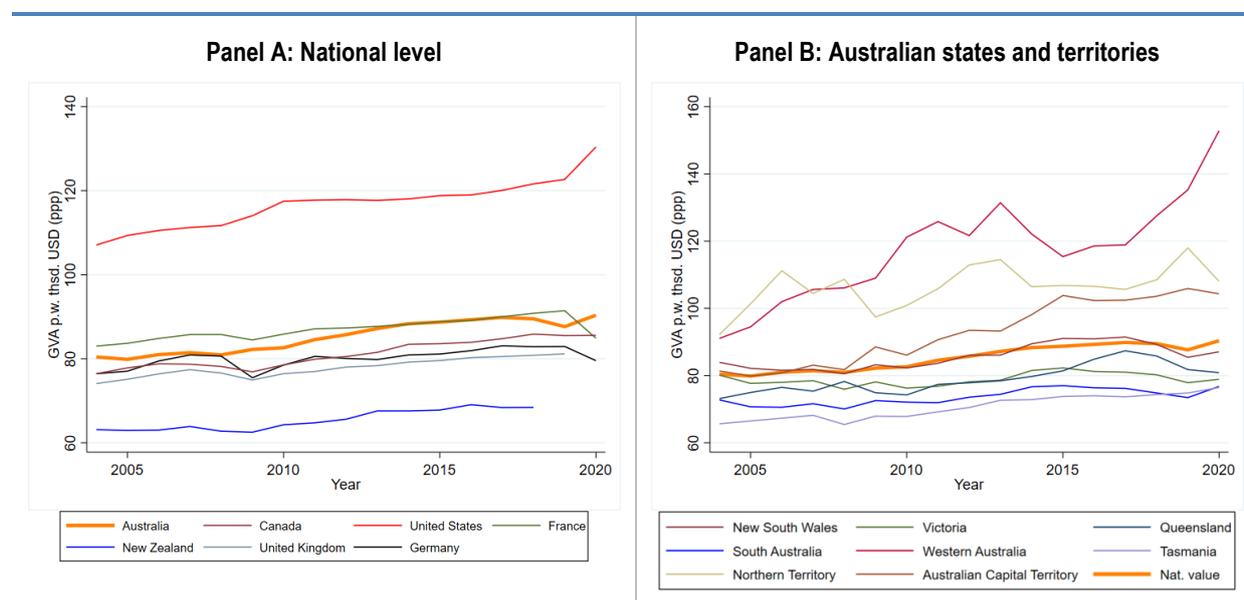
While productivity increased in all Australian regions, except for Victoria, productivity levels diverged across regions as relatively more productive regions significantly outpaced others. Western Australia and the Northern Territory were already the most productive regions in 2004 (Figure 19, Panel B).¹⁴ Between 2004 and 2020, these regions and the Australian Capital Territory also experienced the fastest labour productivity growth, further increasing the productivity gap with the rest of the country.¹⁵ For example, in 2004, labour productivity in Western Australia was 13% above the national average and 39% above the level in Tasmania, the region with the lowest productivity level. As Western Australia's labour productivity rose significantly faster (+3.4% per annum) than the national average (+0.7%), inequality in labour productivity among Australian states increased substantially. In 2020, labour productivity in Western Australia (the best-performing state) was 69% higher than the national average and twice as high as in Tasmania.

¹⁴ Productivity growth observed since the Great Financial Crisis was affected by the commodity boom. For example, the high GDP p.c. in Western Australia was most likely driven by prosperous mining activity in the region. According to the International Trade Administration, Australia hosts more than 350 operating mines. The biggest mining states are Western Australia (one-third) and Queensland (one-quarter). Moreover, iron, which is the most relevant mineral commodity, is almost entirely mined in Western Australia. Coal is primarily mined in New South Wales and Queensland (www.trade.gov/country-commercial-guides/australia-mining).

¹⁵ Similar to labour productivity, the GDP per capita also grew faster in these regions increasing the disparities across regions (see Annex C).

Figure 19. Labour productivity grew in Australia

GVA per worker at the national (Panel A) and regional (Panel B) level, 2004-2020



Note: GVA per worker is reported in thousand USD, constant prices, constant PPP, the base year 2015. The data covers the years 2004-2020 or the latest available year. Panel A presents national values. Panel B presents the values of the Australian states and territories and the national value.

Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed July 2022).

How are migration and productivity linked across space?

Local productivity is a consequence of many factors, such as the skill level of the local workforce, the sectoral composition of the local economy, agglomeration economies, and infrastructure (e.g., airports and roads). These factors are all interconnected, challenging the identification of the contribution of each factor.¹⁶ Based on economic theory, the link between migration and productivity is also ambiguous, as the channels through which migration can affect regional development levels might have positive or negative effects.

Migrants can boost local productivity through several channels. First, migrants can fill shortages in critical positions while bringing new skills and ideas. For example, Alesina et al. (2016_[14]) show that the cultural and ethnic diversity of the migrant population increases local productivity.¹⁷ Second, if a larger labour force due to migration allows workers to become more specialised, it can further improve labour productivity (Peri, 2012_[15]). Finally, migration can also contribute to productivity through firm creation, boosting innovation and trade in their host economies (OECD, 2022_[2]).

¹⁶ Identifying the contribution of each factor requires using advanced econometric techniques and rich datasets, which will be produced as part of the collaboration between the Centre for Population and the OECD.

¹⁷ Diversity is an often used variable in the literature concerning migration and productivity. Generally, it measures how diverse the total population in a specific location is. Depending on the definition, the variables measure how likely it is that two randomly drawn people originate from the same country of birth (incl. Australia). See Elias and Paradies (2016_[18]) for an application of this measure in Australian context.

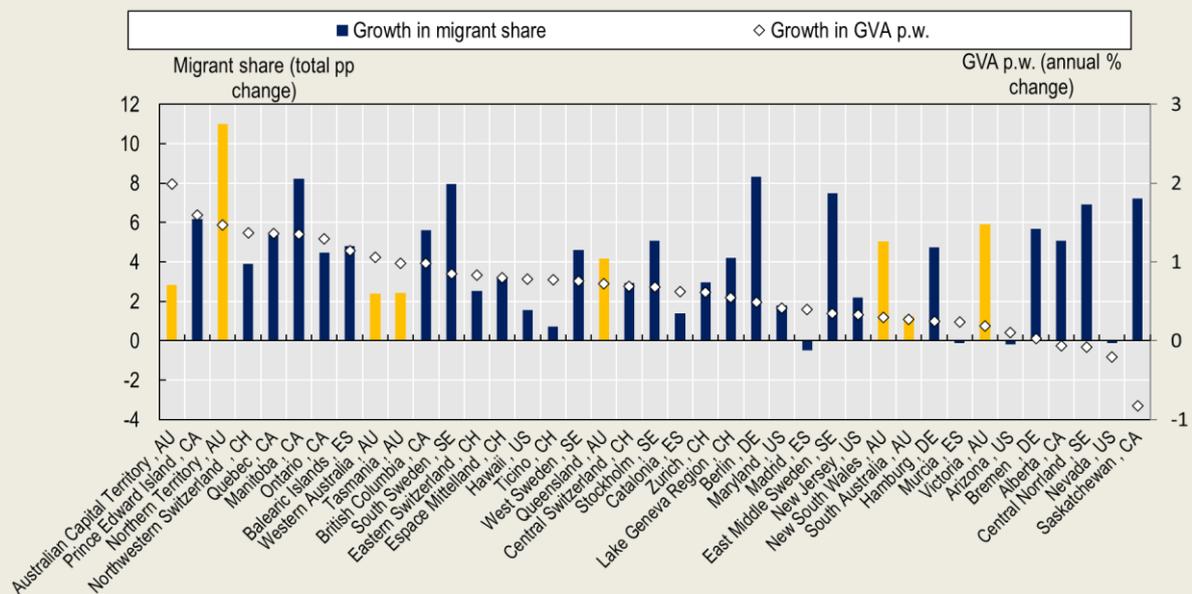
Migration can also lower local productivity. For example, if the human capital of new migrants is below the average human capital of their host economy, this can further lower the average local productivity. Similarly, migration may provide additional cheap labour supply, which may disincentivise firms to invest in technology, hence reducing productivity (Ortega and Peri, 2014_[16]). Finally, cultural and linguistic can complicate communication, making cooperation more difficult which might lower productivity (Parrotta, Pozzoli and Pytlikova, 2014_[17]).

Box 5. Trends in migration and productivity

The arrival of migrants, in particular those who are high-skilled, can benefit regional productivity. However, the relationship between changes in the local share of migrants and labour productivity across OECD regions does not seem straightforward. Figure 20 presents changes in labour productivity (GVA p.w.) and the migrant share for Australian states and territories and selected OECD regions over eight years (2011-2019). During this period, most regions (35 out of 39), including all Australian states and territories, reported an increase in their labour productivity. In Australia, the average percentage increase ranged between 0.2% (Victoria) and 2% (ACT). In parallel, the migration share increased in almost all regions, including all Australian regions.

Figure 20. Regional growth in the migrant share and GVA per worker

Growth in the share of migrants and the GVA per worker in TL2 regions, 2011-2019



Note: The figure presents the total percentage point change of the migration share in the population (left axis) and average annual percentage changes in the GVA per worker (in USD, constant prices, constant PPP, the base year 2015; right axis) from 2011 to 2019. The regions are sorted by labour productivity change, starting with the highest value. Australian regions are displayed in yellow while other OECD regions are displayed in blue.

Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed July 2022).

Comparable regions

The sample used in Figure 20 aims to compare regions with characteristics similar to the Australian state and territories. The regions are selected based on the demographical and industrial indicators listed below. To estimate the economic proximity of OECD regions to the Australian states and territories and identify the most similar regions, the Manhattan distance, a statistical tool to quantify differences over multiple variables, is used.

The underlying indicators are:

- GDP per capita
- Population
- Share of migrants
- Share of employment in industry (ISIC B to E)

Regions that constitute the comparison group are chosen in two steps. In the first step, six countries that have the highest number of regions that are similar to Australian regions are identified. In a second step, for each country, up to ten regions that have the lowest Manhattan distance with each Australian State and Territory are considered. This yields 31 regions in Canada, the US, Germany, Switzerland, Spain, and Sweden.

Regional correlation between migration and productivity

The following figures present correlations between the migrant population and labour productivity at the subnational level. The relationship is examined for a set of OECD regions using the OECD's Regional Database. Further, the correlation at the local level (SA4 areas) is examined, leveraging more granular data for Australia.

OECD regions with higher shares of migrants are more productive, on average

Regional productivity can benefit from attracting high skilled workforce, including migrants. However, the relationship between the local share of migrants and labour productivity is not obvious (see Box 5). Moreover, as migrants are more likely to concentrate in large cities (or regions) where productivity levels and income opportunities are higher than in other parts of the country, accounting for local characteristics (e.g., workforce, industrial composition, local amenities) is crucial to avoid introducing biases in assessing the contribution of migration to local productivity. Econometric analysis can account for the differences in these local characteristics and, therefore, provide clearer insights into how migration affects local productivity (see Box 6).

Box 6. Accounting for education levels

Skill levels of the workforce are among the most important determinants of local productivity. Human capital has strong direct effects on a worker's productivity but also positive spillover effects on co-workers and others in their proximity.

Migrants settle in cities or dense areas where the workforce is, on average, more highly educated. More specifically, places with a higher share of migrant population tend to have also a more educated workforce, potentially explaining observed differences in local productivity. To distinguish the effect of a higher educated workforce on local productivity from the effect of a higher share of migrants, it is crucial to account for the average education levels of the local workforce by adding, for example, the share of tertiary-educated workers in the local area as control variables.

Across OECD regions, the share of migrants and local labour productivity are positively correlated. Regions with a higher share of migrants also report higher levels of labour productivity (Figure 21, Panel A, increasing trend line). The estimated correlation implies that, on average, regions with a one percentage point higher migration share report an 1100 USD (1.08 x 1000 USD) or 1490 AUD¹⁸ higher labour productivity, measured in GVA p.w..

Differences in the educational composition of workers across regions partially explain the positive correlation between migration and productivity. In most countries, migrants and higher educated workers concentrate in large cities. Since a more educated workforce is more productive, part of the positive relationship between migrant share and local productivity may actually be driven by the differences in the educational levels of the local workforce. In fact, once the differences in the regional educational levels of native and migrant populations are netted out, the correlation drops to 0.58 (580 USD or 780 AUD) (Figure 21, Panel B).

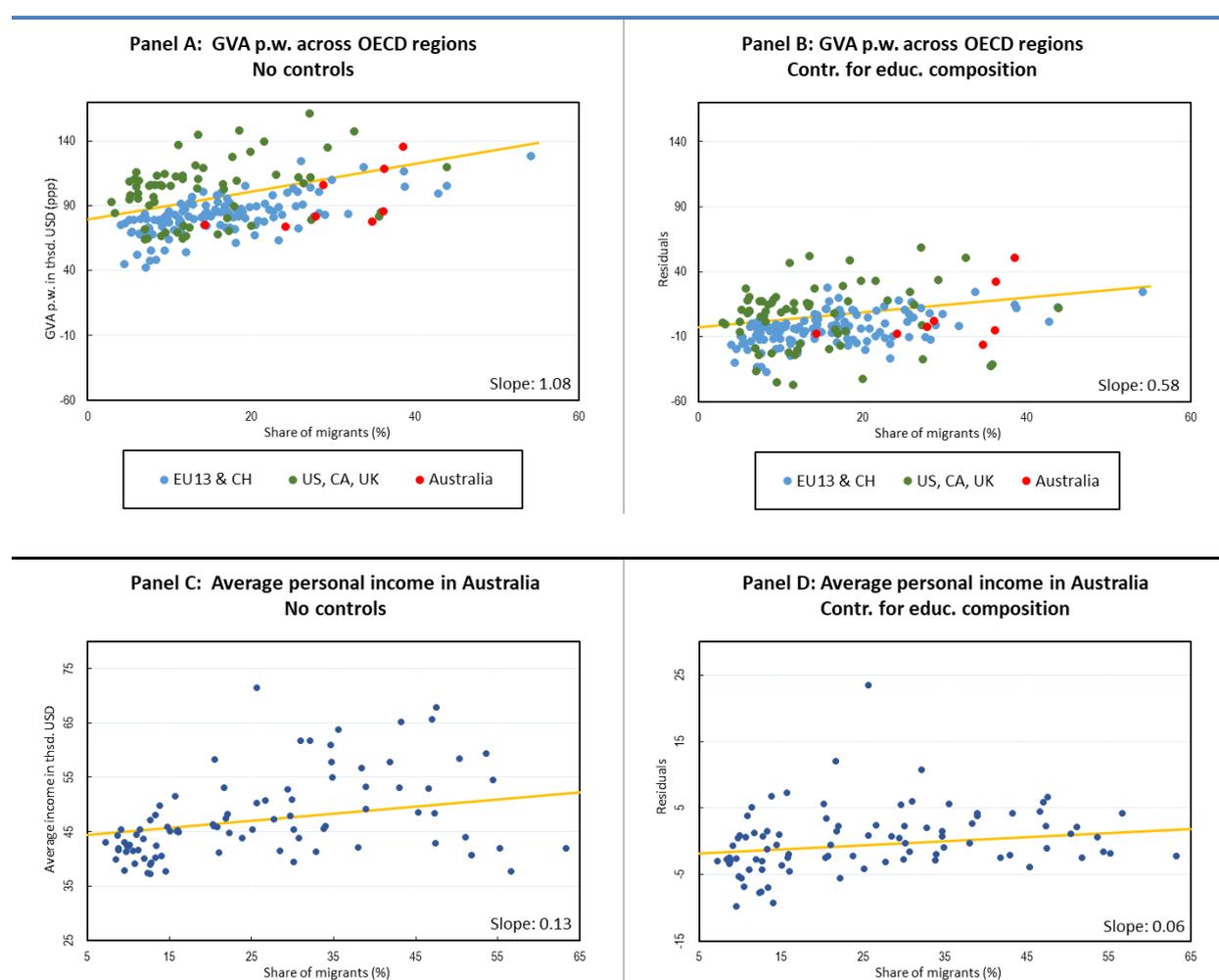
The positive associations between the share of migrants and local economic development also hold across Australian local labour markets (SA4). A one percentage point increase in the share of migrants in the local labour market is associated with around 130 USD higher personal income (0.13 x 1000 USD) or 175 AUD (Figure 21, Panel C).¹⁹ Similar to the analysis across OECD regions, this correlation halves to 0.06 (60 USD or 80 AUD) when controlling for local educational decomposition (Figure 21, Panel D).

¹⁸ The Australian Dollar (AUD) values are calculated using the average exchange rate in 2016 obtained from Reserve Bank of Australia ([Historical Data | RBA](#)). The AUD to USD exchange rate was 0.74.

¹⁹ Due to lack of data, labour productivity at the SA4 level is proxied by average personal income.

Figure 21. Regional labour productivity and the share of migrants are positively correlated

Regional correlations between GVA per worker and share of migrants in TL2 regions, 2019



Note: Panel A and B: Figures plot the correlation between the share of migrants in the region (horizontal axis) and GVA per worker in the region (Panel A) and the residuals (Panel B). Dots correspond to TL2 regions. Burgenland (AT), North Aegean (EL), Western Macedonia (EL), Epirus (EL), Thessaly (EL), Ionian Islands (EL), Peloponnese (EL), Åland (FI), Corsica (FR), Aosta Valley (IT), Alentejo (PT), District of Columbia (US), Eastern and Midland, and Southern (IE) are excluded. Data are for 2019. Panel C and D: Figures plot the correlation between the share of migrants (horizontal axis) and the average annual income (Panel C) and the residuals (Panel D), respectively. Dots correspond to SA4 regions. Data are for 2016. Panel A-D: The residuals are obtained through a linear regression where the dependent variable is GVA per worker (Panel B) or average annual income (Panel D), regressed on the educational decomposition of native-born and migrants. Box 6 provides further information on the importance of controls. The trendline represents the correlation. The note on the bottom right corner of each individual figure indicates the estimated correlation (i.e., the slope of the trendline). All estimated correlations are weighted by the total population size.

Source: Panel A and B: OECD calculations based on data from OECD Regional Statistics (database) (accessed May 2022). Panel C and D: Australian Census of Population and Housing 2016 accessed via ABS Census TableBuilder (accessed January 2022).

The positive correlation between labour productivity and the share of migrants provides suggestive evidence but requires higher-quality data and advanced methods to deliver causal findings. The positive correlation in Figure 21 suggests a positive impact of migration on local labour productivity. However, as the inclusion of the educational level illustrates, productivity depends on a range of different aspects, which need to be disentangled carefully. A positive effect of migration on local productivity would be in line with Alesina et al. (2016_[14]), as Australia is a relatively rich country and has high-skilled migrants. Still, data covering multiple years and more complex empirical strategies are required to confirm these findings to disentangle the complexity of labour productivity and address issues related to the non-random self-allocation of migrants across regions.

Conclusions

This paper presents descriptive evidence on the relationship between migration, productivity, and labour market outcomes across Australian regions and local labour market areas. Using various data sources and spatial levels, it provides evidence of the interaction of these three factors at the local level in Australia. Additionally, the relationship is benchmarked against comparable OECD countries to elicit patterns that are unique to the Australian context.

The paper starts with an overview of migration in Australia. It shows that migrants in Australia are more likely to live in metropolitan areas and have higher levels of education compared to migrants in other OECD countries. Despite having higher average education than native-born, migrants are less likely to be employed in the labour market. The employment gap between migrants and native-born is driven mainly by the lower employment rate of female migrants.

Additionally, the paper assesses the labour market integration of migrants with respect to that of the native population and documents a positive link between the share of migrants and employment rates across regions. However, the observed relationship seems heterogeneous between males and females as well as between native-born workers with high and low educational attainments. Finally, it shows migration and productivity are positively correlated even after accounting for the education of the local workforce.

This paper assesses the characteristics of migration across Australian regions and provides insights into the role of migration on regional economies in Australia. Depending on the visa regulations and law enforcement, migrants in Australia can benefit from free movement allowing them to settle in regions with booming labour markets or higher productivity/income levels. These non-random settlement patterns within countries make it challenging to disentangle the gains associated with migration and those that are due to local economic characteristics. Advanced econometric techniques and large administrative datasets can help address some of these issues while establishing causal relationships, which is crucial for informing policy.

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Annex A. Additional information on data sources

Municipality Migrant Database (MMD)

The dataset contains information on migrants and their population share in municipalities (or census tracts) in 22 OECD countries (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the UK, and the US).

For most countries, the data coverage starts in 2010 and ends in 2019. The main characteristics available at the municipal level include country of origin, age, and gender. The statistics on foreign-born are based on the resident population. The main data sources are countries' population surveys, complemented by census data in countries without continuous population surveys. For Australia, data are available for the Census years (2001, 2006, 2011, 2016)

Contrary to the data for large (TL2) regions, the indicators for more granular levels of geography cover the entire resident population. Thus, they are not limited to the working-age population but offer insights into the local share of migrants for all age groups.

Source: Astruc-Le Souder et al. (forthcoming), "Going granular - A new database on migration in municipalities across the OECD", OECD Publishing, Paris.

OECD Regional Migration Database

The underlying data rely on various labour force surveys to assess the geographic distribution, educational attainment, and the labour market integration of migrants across regions in OECD countries. The main data sources are the European Community Labour Force Survey (EU-LFS) for the European OECD countries, the American Community Survey for the United States, the Labour Force Survey for Canada, the National Survey of Occupation and Labour for Mexico, the Survey of Education and Work (SEW) for Australia, the Monthly Labour Force Survey for Israel, the Encuesta Nacional de Empleo (ENE) for Chile, the Gran Encuesta Integrada de Hogares (GEIH) for Colombia, and the Resident Registered Population Status Census, the Immigrant Status, and Employment Survey as well as the Survey of the Economically Active Population for Korea, which all contain information on the country of birth or nationality of the local resident population. To ensure comparability, only countries with more recent data than 2015 are included in the analysis in this chapter.

The sample of all analyses in this chapter is restricted to residents in the 15 to 64 age group. The analysis uses the common approach of defining migrants as those individuals born in a foreign country, regardless of their arrival in their resident country. For European countries, migrants are further split into two groups based on their country of birth: those born in another EU-member country (i.e., EU migrants) and those born in a country outside of the EU (i.e., non-EU migrants). EU migrants are all those workers who are born in an EU Member State other than the one where they currently work and reside. Non-EU migrants are all those workers who are born outside of the Union. Finally, anyone who was born in their country of residence is considered native-born.

Comparing Australian regions with other OECD regions

The data of this analysis sources from two datasets:

- OECD.stats: Labour force information from 2011 until 2019.
- Regional migration dataset: Native-born and migrant information.

The sample of the analysis contains the TL2 regions of Australia, the US, Switzerland, Canada, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, and the United Kingdom, which are assigned into three groups.

- Australia is the country of interest. In Australia, the TL2 classification corresponds to the state and territory level. Due to its small size, the Northern Territory is excluded from the analysis.
- The UK, US, and CA are considered as one comparison group representing the economically most proximate English-speaking countries.
- The remaining countries form the "EU-13 + Switzerland" group containing the former EU15 countries (without Luxembourg and the UK) and Switzerland.

Australian Local Labour Markets (SA4 regions)

The data for this analysis sources from the Census of Population and Housing for 2011 and 2016:

- The data was accessed via ABS Census TableBuilder.
- Employment, unemployment, and participation information source from the labour force status.
- Migration share is the percentage share of foreign-born in the population.
- Two education groups are constructed. First, *below tertiary education* refers to people with post-secondary non-tertiary education or lower education attainment - this corresponds to *Certificate level IV* or below in the Australian Standard Classification of Education (ASCED). Secondly, tertiary education refers to short cycle tertiary and above - this corresponds to an *Associate degree, advanced diploma, and diploma* and above (ASCED).
- The geospatial unit of analysis is the Statistical Area (SA) Level 4, which was constructed by ABS to reflect local labour markets.

Annex B. Comparing Australian regions with other OECD regions

The data of this analysis sources from two datasets:

- OECD's Regional Database: GVA per worker in USD, constant prices, constant PPP, the base year 2015 at TL2 level.
- OECD Regional Migration Database: Native-born and foreign-born information.

The sample of the analysis contains the TL2 regions of Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Switzerland, Spain, Sweden, the United Kingdom, and the United States, which are assigned into three groups.

- Australia is the country of interest. In Australia, the TL2 classification corresponds to the state and territory level.
- The UK, the US, and CA are considered as one comparison group representing the economically most proximate English-speaking countries.
- The remaining countries form the "EU-13 + Switzerland" group containing the former EU15 countries (without Luxembourg and the UK) and Switzerland.

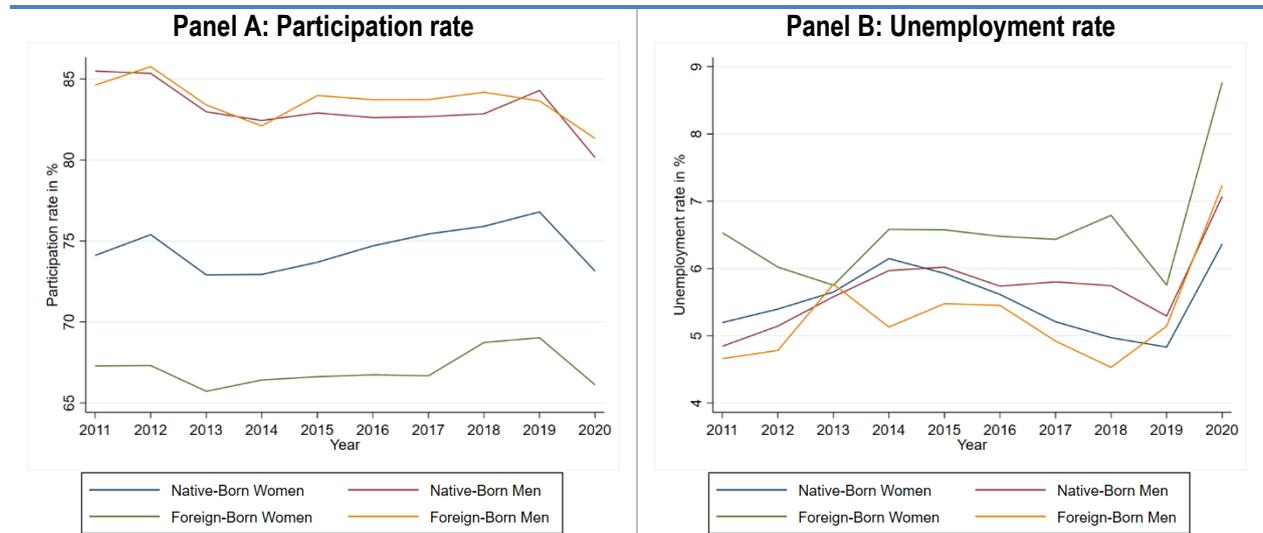
Comparing Australian local labour markets

The data for this analysis sources from the 2016 Census:

- The data was accessed via ABS Census TableBuilder (accessed January 2022).
- *Average income* is derived from the *Total personal weekly income (INCP)*.
 - The American Dollar (USD) values are calculated using the average exchange rate in 2016 obtained from Reserve Bank of Australia ([Historical Data | RBA](#)).
- *Migration share* is the percentage share of foreign-born in the total working-age population.
- The geospatial unit of analysis is the Statistical Area (SA) Level 4, which corresponds to local labour markets.

Figure A B.1. Participation and unemployment rate of native-born and migrants by gender

Participation rate (Panel A) and unemployment rate (Panel B), 2010-2020



Note: Panel A presents the participation rate by gender and origin (native-born or foreign-born). Panel B presents the unemployment rate by gender and origin.

Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed May 2022).

Annex C. Recent trends in the Australian economy

The Australian economy rose faster than in other major OECD countries during the 2000s before it slowed down over the last decade

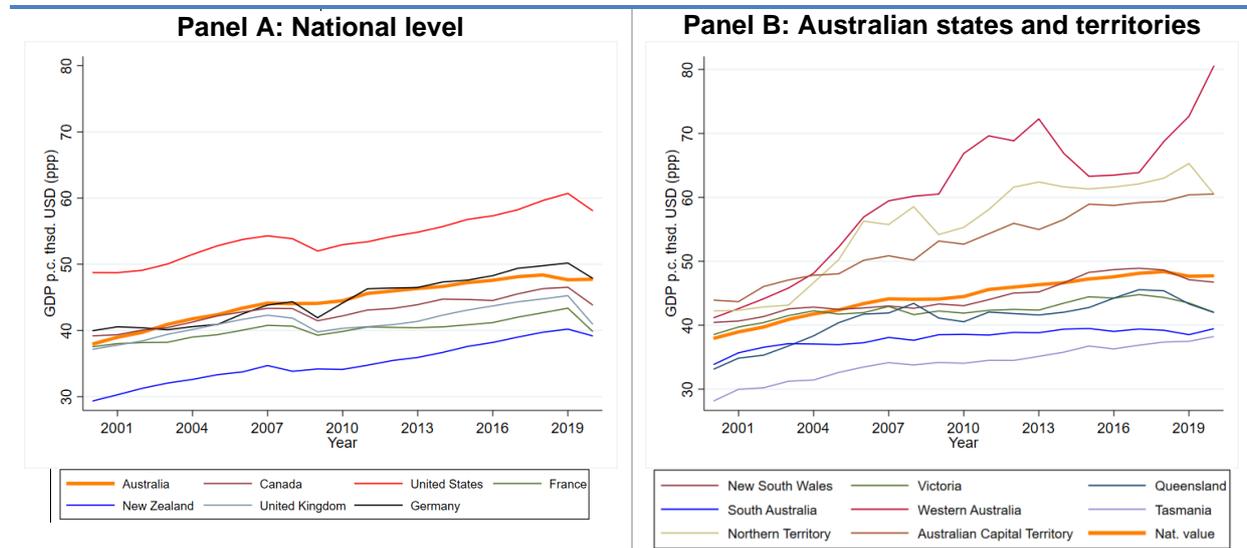
The Australian economy grew faster than in other OECD countries between 2000 and 2008. Until the Global Financial Crisis of 2008, GDP per capita (p.c., henceforth) in Australia increased, on average, by 1.9 % per year, compared to 1.4% per year in the other comparable OECD countries (Figure A C.1, Panel A). However, from 2008 onwards, Australia's GDP p.c. increased at a slower speed. Between 2008 and 2020, Australia's economy grew by 0.6% per year. While Australia's growth was still above the average of comparable OECD countries (0.3%) per year, other countries like New Zealand and Germany recorded faster growth of 0.95% and 0.7%.

Economic growth during the last two decades has been uneven across Australian regions. Between 2000 and 2020, GDP p.c. grew fastest in Western Australia and the Northern Territory, leading to a divergence from other regions (Figure A C.1, Panel B). The growth rate was particularly strong in Western Australia, where between 2000 and 2020, GDP p.c. grew on average by 3.5% per year, compared to the average growth of 1.2% at the national level.²⁰ Consequently, while GDP per capita in Western Australia (the best-performing state) was 46% higher than in Tasmania (the worst-performing state) in 2000, the difference grew to 111% in 2019.

²⁰ It should be noted that the high GDP p.c. in Western Australia was most likely driven by prosperous mining activity in the region. According to the International Trade Administration, Australia hosts more than 350 operating mines. The biggest mining states are Western Australia (one-third) and Queensland (one-quarter). Moreover, iron, which is the most relevant mineral commodity, is almost entirely mined in Western Australia. Coal is primarily mined in New South Wales and Queensland (www.trade.gov/country-commercial-guides/australia-mining).

Figure A C.1. GDP per capita across selected countries and within Australia

GDP per capita at the national (Panel A) and regional level (Panel B), 2000-2020



Note: GDP per capita is reported in thousand USD, constant prices, constant PPP, the base year is 2015. The data covers the years 2001-2020 or the latest available year. Panel A presents national values for selected OECD countries. Panel B presents the values of the Australian states and territories and the national value. See Footnote 6 for abbreviations of the Australian states and territories.

Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed May 2022).

Annex D. Sectoral composition of Australia and its regions

Australia's sectoral composition is similar to other developed OECD countries

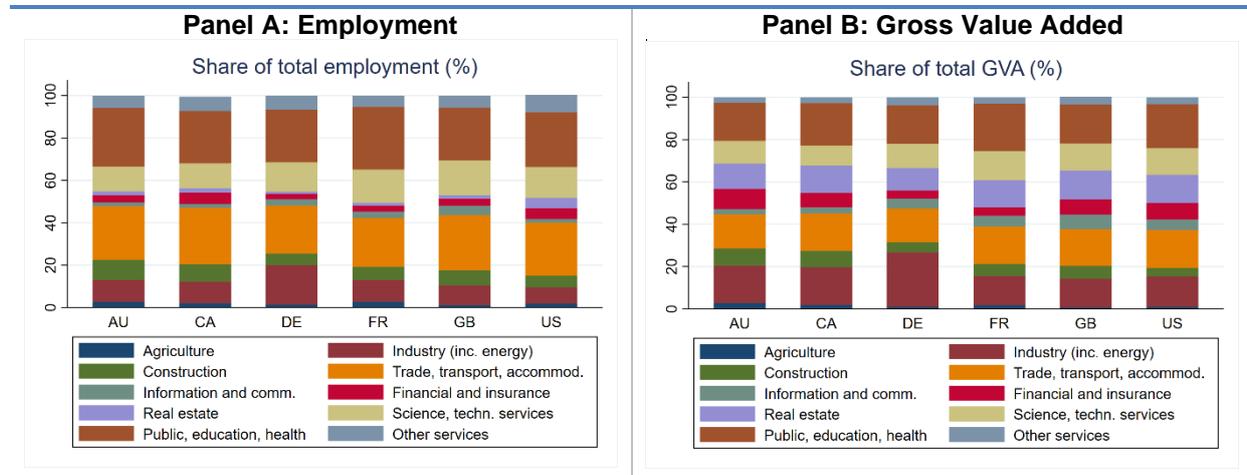
Different sectors in an economy have different productivity levels. Some sectors, such as product assembly, add comparatively little value per employed worker compared to others, such as research and development (R&D), which generate higher value-added per worker. Consequently, regions relatively more specialised in high-value-added sectors are likely to report also higher average productivity and income. Thus, examining the sectoral composition of the regional economy is a natural first step in understanding productivity differences across regions.

The sectoral composition of the Australian economy is similar to other major OECD countries. Figure A D.1 presents the sectoral decomposition by total employment and gross value added (GVA) in major OECD countries. The relative importance of different sectors in terms of employment and GVA in Australia is comparable with other OECD countries such as Canada, France, and Great Britain (Figure A D.1, Panel A). In Australia, the most relevant sectors in terms of industrial composition are trade and transport, with 25% of the total employment and 16% of total GVA, as well as public administration, education, and health, with 28% and 17%, respectively.²¹

²¹The sectors refer to the International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4. Trade and transport refers to Wholesale and retail trade; repair of motor vehicles and motorcycles (Section G); Transportation and storage (Section H); Accommodation and food service activities (Section I). Public administration, education, and health refers to Public administration and defence; compulsory social security (Section O), Education (Section P), and Human health and social work activities (Section Q).

Figure A D.1. International employment and GVA by sector

Among selected OECD countries, employment by sector, 2018, and GVA by sector, 2017

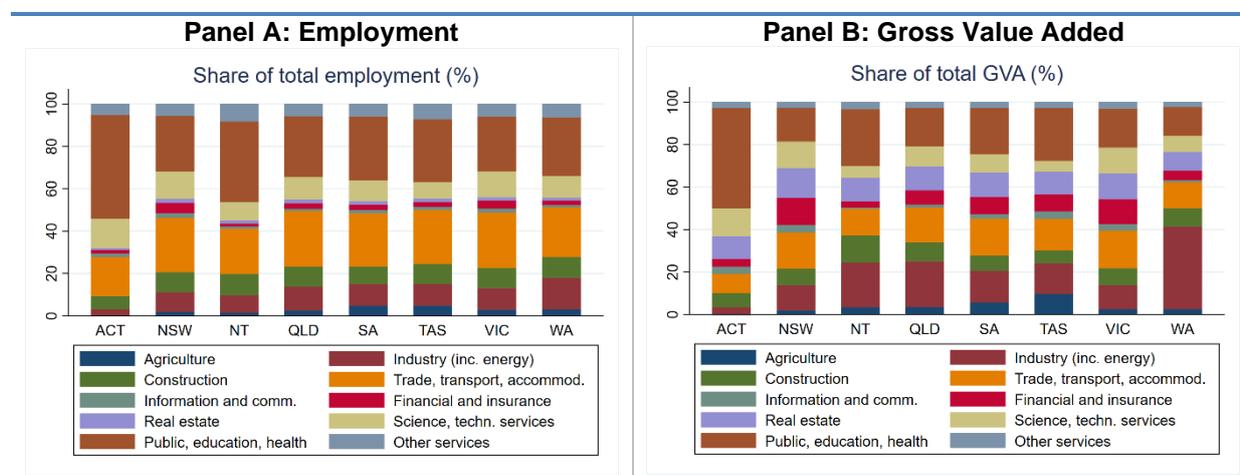


Note: Panel A shows the national employment disaggregated by ISIC rev 4 industry level for selected OECD countries. The data in Panel A is as of 2018. Panel B shows the national GVA (gross value added) disaggregated by ISIC rev 4 industry level for selected OECD countries. The data in Panel B is as of 2017, the latest available year for Australia. See Footnote 6 for abbreviations of the Australian states and territories. Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed March 2022).

Despite a similar overall composition across Australian regions, the Panel A of Figure A D.2 shows that New South Wales and Victoria, which host the two major cities (Sydney and Melbourne), have significantly larger shares of employment in the financial and science sectors. While Western Australia is the state with the highest percentage of workers employed in the industry sector (most likely due to extensive mining activities in the region), the Australian Capital Territory has the largest share of workers employed in public administration, education, and health, as well as science. The share of industrial and financial activities in the regional GVA is consistently larger than their share in employment (Figure A D.2, Panel B). This is especially pronounced in Western Australia, Queensland, and the Northern Territory, which hosts a large share of the national mining industry. Similarly, New South Wales and Victoria, with their major business hubs in Sydney and Melbourne, report higher contributors of financial activities to regional GVA.

Figure A D.2. Australian employment and GVA by sector and state/territory

Employment by sector, 2018, and GVA by sector, 2017



Note: Panel A shows the regional employment disaggregated by ISIC rev 4 industry level for the Australian states and territories. The data in Panel A is as of 2018. Panel B shows the regional GVA (gross value added) disaggregated by ISIC rev 4 industry level for the Australian states and territories. The data in Panel B is as of 2017, the latest available year for Australia. See Footnote 6 for abbreviations of the Australian states and territories.

Source: OECD calculations based on data from OECD Regional Statistics (database) (accessed March 2022).