Regional patterns of Australia's economy and population

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Overview

Many people believe Australia's regions are getting a raw deal compared to the big capital cities. This working paper tells a more nuanced story.

Opportunities, economic growth, employment, and population shifts are not distributed evenly across Australia.

Consumption and jobs have continued to shift from manufacturing to services. High-skilled service jobs have grown particularly quickly, and these tend to cluster towards the centres of the capital cities. As a result, the inner suburbs of our cities tend to have higher average incomes, more income growth, more and faster-growing income inequality, higher population growth and the highest concentrations of people with tertiary education and migrants, particularly from English-speaking countries.

Outer suburbs in the capital cities tend to have lower levels of income growth and tertiary education, but very high population growth and more migrants. Migrants from Asia, Africa and the Middle East are more likely to settle in these suburbs. Unemployment tends to be concentrated along the spines of major roads through these outer suburbs.

Most regional areas in non-mining states have lower incomes, fewer people with tertiary education, older populations, less population growth and fewer migrants. However, income growth per person in most regional areas has kept pace with the average in their State over the past decade. While unemployment varies between regions, it is not noticeably higher in the regions overall.

The east coast "sea change" towns often have different patterns to inland regions of eastern states. Their incomes have grown more rapidly – and are more unequal. Their populations have grown faster, they are older, more have tertiary education, and more have migrated from English-speaking countries and Europe. However, unemployment is relatively high.

The mining boom has led to different patterns in Western Australia and Queensland. Incomes are higher, and have grown faster, across these states. In mining regions such as the Pilbara, incomes, income inequality, and tertiary education levels are particularly high, and populations grew faster over the past decade.

Other patterns can be identified. The population has grown faster and is younger in Ballarat and Bendigo than other inland regions of Victoria. Tertiary education levels are particularly low, and unemployment is particularly high, in central WA and the Northern Territory.

These are generalisations. As always, there are exceptions at a more detailed level. Some of these are outlined in this report, others are evident from the maps it presents, and more can be identified from the linked online maps.

This working paper is part of broader work at Grattan Institute trying to understand why the vote for minor parties has risen rapidly over the past decade, particularly in regional electorates. A forthcoming report will examine how these voting trends might reflect the economic and demographic trends outlined in this paper, as well as other cultural and institutional factors.

Table of contents

1   Introduction

This working paper examines trends in incomes, employment, and demographics across Australia over the past decade. The trends outlined have been influenced by broader economic forces: a mining investment boom that boosted investment and incomes in particular regions; and the continuing shift of consumption and employment from agriculture and manufacturing to services.

1.1   The mining boom

Mining has contributed more to Australian income and output since 2006. Unprecedented prices for commodities – especially coal and iron ore – increased incomes. Prices remain higher than long-term averages, even if they have now fallen substantially from their peak. Investment in the mining sector also grew strongly: mining investment has averaged 5.7 per cent of GDP since 2006, compared to 1.9 per cent in the 45 years before the boom.[1]

The share of national jobs in the mining sector rose from 1.3 per cent in 2006 to peak at 2.4 per cent in 2012.[2] Mining's share of the national economy rose from 9.7 per cent to 13.2 per cent over the same period.[3] While the boom boosted incomes across Australia, the effects were not evenly distributed.[4] The boost was most evident in the mining regions of the Pilbara, Surat and Bowen basins. Perth and Brisbane also benefited, with higher incomes and more jobs (Chapter 2).

1.2   The march of the services sector

As in other countries, Australians continue to spend a growing share of their wallet on services.[5] The long-term trend continued over the past two decades, with fewer working in agriculture and manufacturing and more working in services (Figure 1.1 on the following page). Since the mid-1980s, the share of jobs in agriculture, forestry and fishing has fallen from 6.1 per cent to 2.5 per cent and in manufacturing from 16.1 per cent to 7.5 per cent.[6] Manufacturing's share of the economy declined accordingly.[7]

The decline of the manufacturing sector is not unique to Australia – manufacturing is employing a lower share of the workforce in most developed economies[8] – but Australia is further down this road than most.[9]

In contrast, the services sector has continued to grow. It now employs 79 per cent of Australian workers, up from 73 per cent in 2000. Jobs in accommodation and food services, education and training, and healthcare and social assistance have expanded particularly rapidly.[10] So long as Australians continue to spend their additional earnings on services, the trend is likely to continue.

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1.   Minifie et al. (2017, p. 16).
2.   ABS (2017a).
3.   Industry share of value-added. ABS (2017b).
4.   Minifie et al. (2013, p. 1).

5.   Beech et al. (2014, p. 16).
6.   ABS (2017a).
7.   ABS (2017b).
8.   Langcake (2016, p. 28).
9.   Manufacturing value added as a proportion of GDP has declined from 25 per cent of GDP in Australia in 1970 to 9.6 per cent in 2015. The OECD median declined from a similar starting point to 16 per cent in 2015. OECD (2017).
10.   ABS (2017b).

This change in industry composition has geographic consequences. The loss of agricultural and manufacturing jobs is felt most acutely in regional areas and on the city fringes.

Some services jobs – such as healthcare – are distributed across regions. But higher-end services jobs tend to cluster in the centre of cities. There are big benefits to 'agglomeration' – being close to lots of other service firms.[11]

These new service-sector jobs attract people from both overseas and within Australia, who tend to be younger and more educated. Other areas – further away from the centre of cities – have fewer service-sector jobs, attract fewer migrants, and tend to be left with fewer highly educated, high-income residents.

These broader forces underlie many of the economic and demographic trends mapped in the remainder of this paper.

1.3 Outline of this paper

This working paper uses demographic and economic data from the 2016 Census as well as income data from the Australian Taxation Office and employment data from the Department of Employment.

Together these statistics paint a detailed picture of how Australia is shaped by incomes, jobs, populations, and migration.

This paper presents maps that show the current distribution between different regions of income, income inequality, unemployment, population, migration, education and age. It also maps how these have changed in different regions over the past decade.

More detailed information on the methodology underpinning each map is at Appendix A. Interactive versions of the maps that enable more

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11. Kelly and Donegan (2015, pp. 23–36).

Figure 1.1: More and more Australians work in services
Share of workforce by sector, per cent
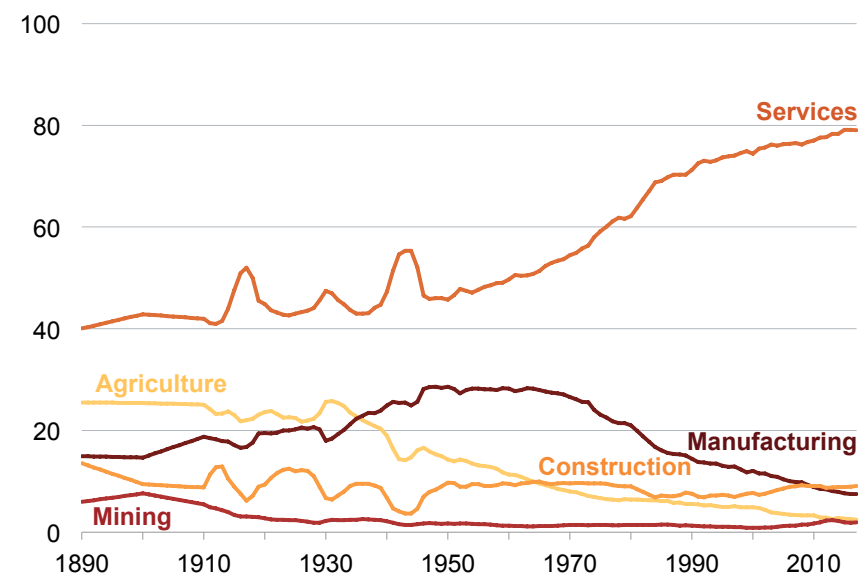
Notes: Data for 1981-1983 are interpolated using 1980 and 1984 data.
Source: Withers et al. (1985) and ABS (2017a).

detailed examination of particular areas can be accessed by clicking on the maps in the online version of this paper at: https://grattan.edu. au/report/regional-patterns-of-australias-economy-and-population/ or accessed from the maps hosted at: https://www.grattan.edu.au/ publications/maps-regional-patterns/

1.4   Future directions

This paper provides background for a forthcoming Grattan Institute report on growing political fragmentation in Australia. First-preference Senate votes for major political parties are falling while minor party votes are rising. Although the minor party vote is rising everywhere, it has risen particularly fast in regional areas.

These voting patterns are being used to justify all kinds of policy changes such as increased income redistribution, more spending on regional development, tighter migration controls, and more intrusive security regulation. But these policies and proposals are all based on assumptions about what is really driving voting patterns.

Our future report will explore the common explanations – economic dislocation, cultural change and falling trust in institutions – to identify which of them are plausibly linked to shifts in voting. The economic and demographic information in this paper provides important context for understanding these voting trends.

2 Income growth and inequality

While average incomes are higher in the cities, income *growth* per person in the past decade has not been obviously different in the regions. However, the total size of city economies grew faster because their populations grew faster.

Regional areas tend to have much lower (within region) inequality. While inequality has increased everywhere, it has increased less in the regions than in the major cities.

2.1 Average incomes are higher in the cities

Average incomes tend to be highest in city postcodes (Figure 2.1).[12]

Perth is the only major city to have incomes over $60,000 in all sub-urbs within 10 km of its centre (Figure 2.3 on page 10). Sydney and Melbourne also have a number of very affluent suburbs – the highest mean incomes in Australia are in Sydney's northern suburbs. But there are pockets of disadvantage in both cities: Sydney's west and Melbourne's north-west and far south-east have several suburbs with below-average incomes.

Adelaide and Brisbane have some inner suburbs with above-average incomes, but these cities also have larger swathes of low-income suburbs compared to other major cities.

Most regional areas in New South Wales, Victoria, Tasmania and southern Queensland have below-average incomes. The major exceptions are the area including Broken Hill in NSW, the upper Hunter region, the Victorian high plains, and the west coast of Tasmania.

Figure 2.1: Average income is higher in inner-city postcodes
Average taxable income per tax filer, 2014-15, $000s, by postcode
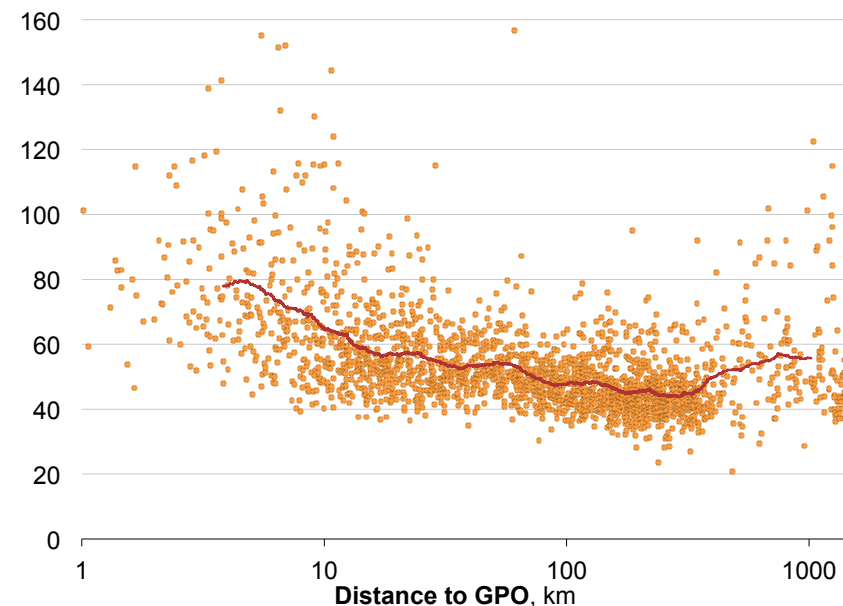
Notes: This and similar charts in the working paper show a trendline calculated as a moving average. A small number of outliers have been excluded from the chart to aid readability.

Source: ATO (2017, Table 8); Grattan analysis.

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12. This report uses ATO data of taxable income by postcode rather than Census data, as it appears to be more robust, with more accurate information for those with high incomes and from regional areas: see Appendix A.1 on page 33.

Regional areas in Western Australia, South Australia, the Northern Territory and northern Queensland typically have above-average incomes. Incomes are particularly high in mining areas in the Pilbara in Western Australia, the Bowen Basin in Queensland, and Olympic Dam in South Australia.

## 2.2 Average income growth is similar across cities and regions

Income growth per person has been similar across city and regional areas over the past decade. Some remote areas have experienced very strong income growth (Figure 2.2), mostly in mining areas in Western Australia and Queensland (Figure 2.4 on page 11). But this is not just a mining-state phenomenon: average growth rates have been similar between the city and regions in every state over the decade (see Section 2.4 on page 13).

In Sydney, Melbourne and Adelaide, income growth per person was highest in areas closest to the city centres, and typically below average in suburban areas. By contrast, incomes grew strongly in all of Perth's suburbs and most of Brisbane's suburbs. These capitals benefited from increased corporate activity and high-income fly-in fly-out workers associated with the mining boom in the Pilbara and the Bowen Basin.

Although income growth per person was similar across cities and regions, the total size of the economy in city areas grew faster because of faster population growth rates (Chapter 4).

Figure 2.2: Income growth has been similar in cities and regions
Annual growth in real taxable income per tax filer 2003-04 to 2014-15, by postcode
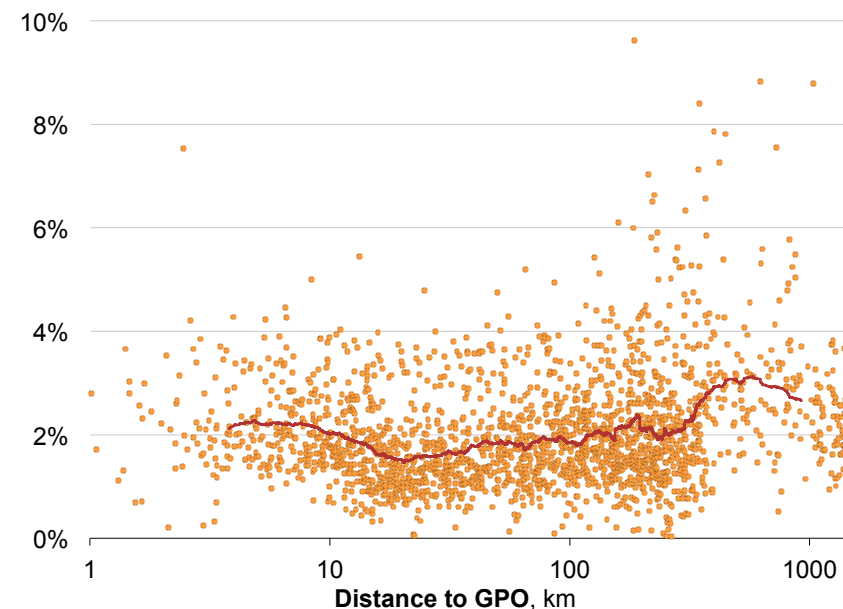
Notes: The growth rate is calculated as the compound annual growth rate (CAGR) in income per tax filer 2003-04 to 2014-15. A small number of outliers have been excluded from the chart to aid readability.
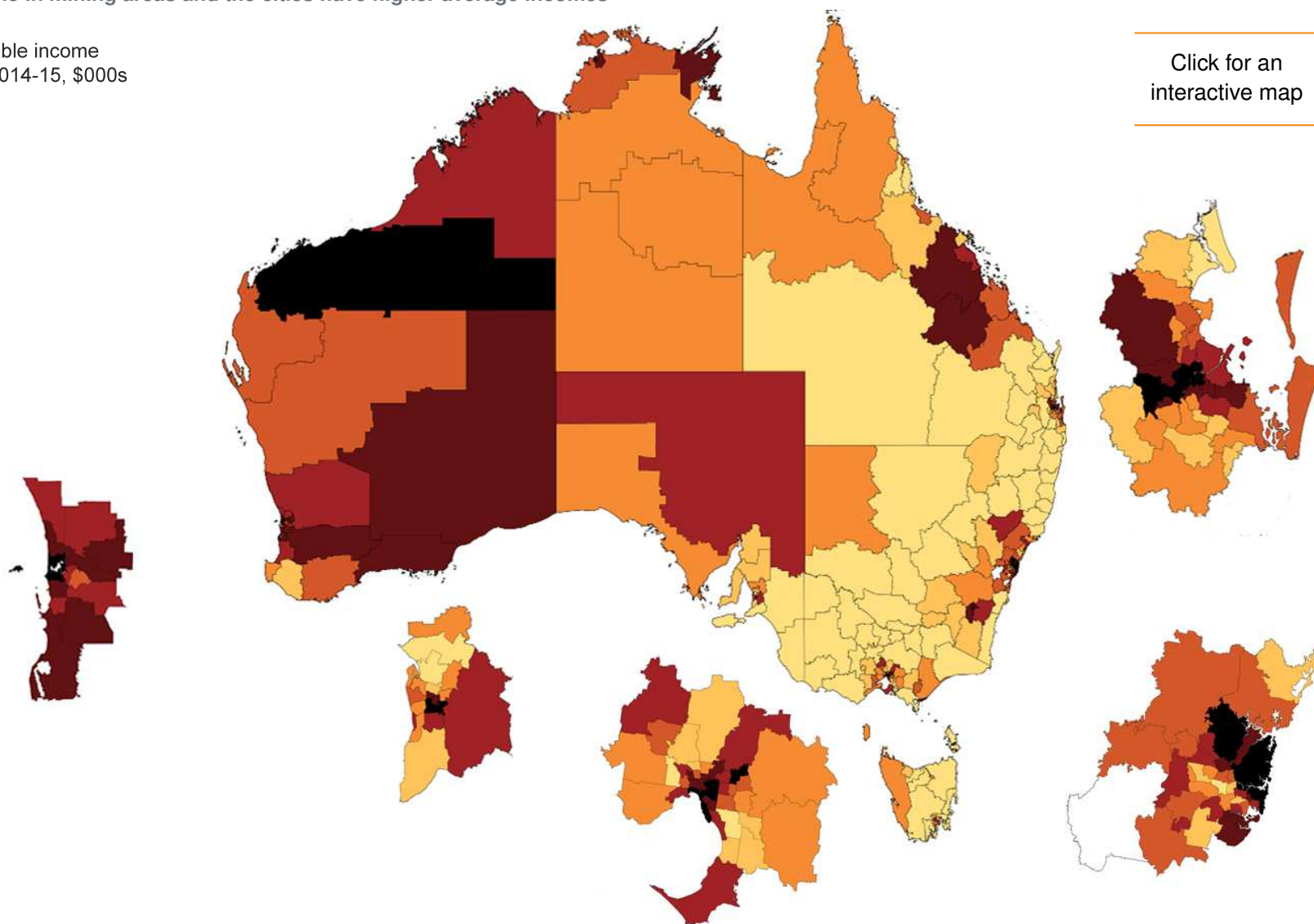
Source: ATO (2017, Table 8); Grattan analysis.

Figure 2.3: People in mining areas and the cities have higher average incomes

Average taxable income
per taxfiler, 2014-15, $000s

- $46k
- $49k
- $52k
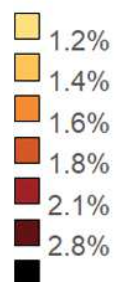- $56k
- $61k
- $70k

Click for an
interactive map

Notes: Map is coloured by ABS Statistical Area Level 3s (SA3s), and grouped into population-weighted septiles. The outer suburbs of Brisbane have been excluded to aid readability. See Appendix A for a discussion of map methodology.

Source: ATO (2017, Table 8); Grattan analysis.

Figure 2.4: Cities and regions have areas of high income growth

Average annual growth
real taxable income per tax filer 2003-04 to 2014-15

- 1.2%
- 1.4%
- 1.6%
- 1.8%
- 2.1%
- 2.8%

Click for an
interactive map

Notes: The growth rate is calculated as the CAGR in income per tax filer 2003-04 to 2014-15. Map is coloured by ABS SA3s, and grouped into population-weighted septiles. The outer suburbs of Brisbane have been excluded to aid readability. See Appendix A for a discussion of map methodology. This map has been updated from the original release of this report.
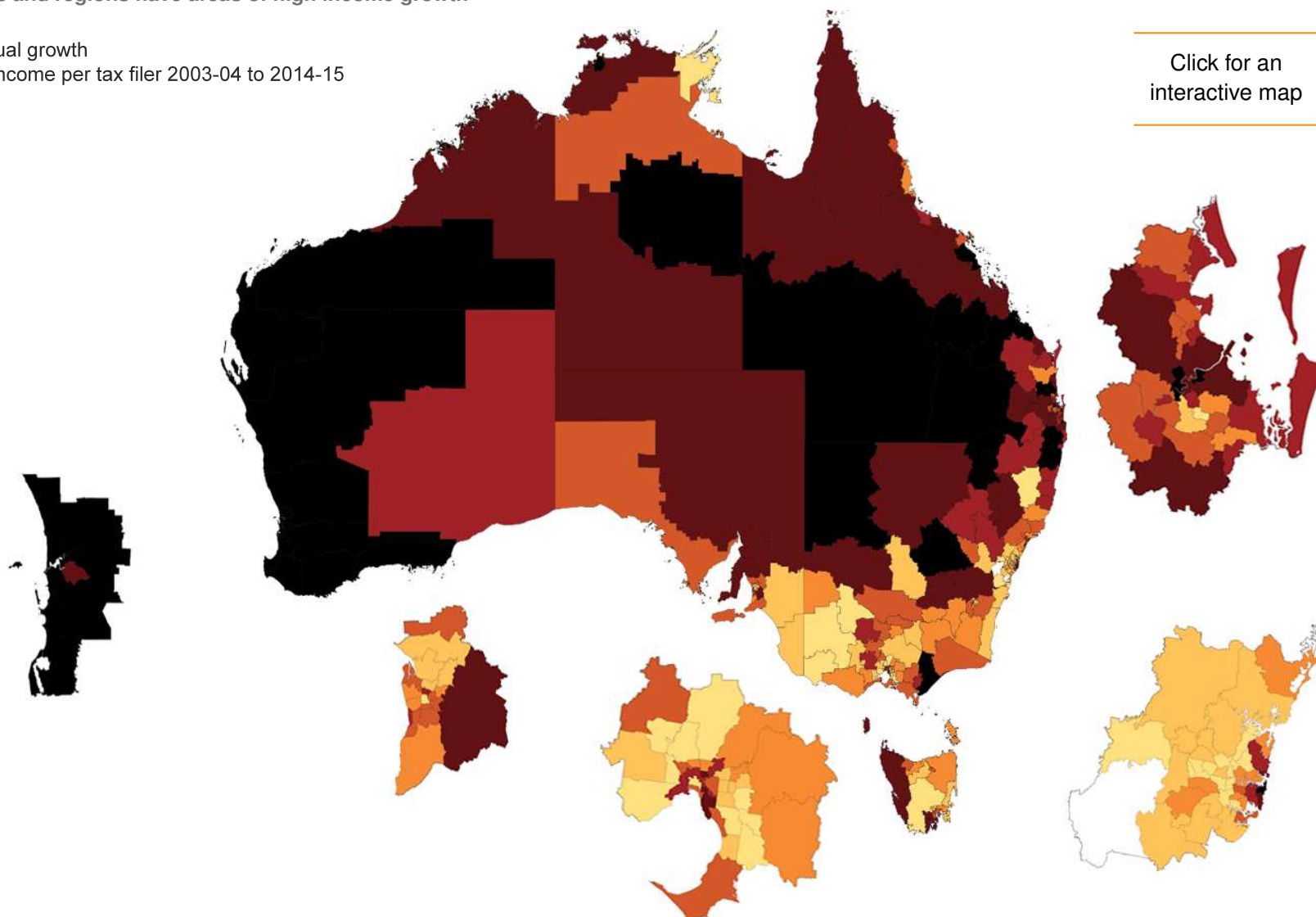*Source: ATO (2017, Table 8); Grattan analysis.*

2.3 Increases in income inequality are less pronounced in the regions

Inequality in post-tax incomes has not changed much over the past decade in Australia. According to an ABS survey, post-tax household incomes have become a little less equal because incomes at the top have grown faster than those at the bottom Figure 2.5.[13]

But this differential in growth rate may be explained by a change in methodology.[14] The Household, Income and Labour Dynamics in Australia (HILDA) survey indicates that post-tax incomes of high- and low-income households grew at the same rate, and maintained the same relativity, between 2001 and 2014.[15]

Looking at income inequality within regions – since people often compare themselves to those living nearby – areas closer to the cities tend to be less equal than regional areas (Figure 2.6 on the following page).

CBD areas and high-income suburbs to the east of Melbourne and Adelaide and inner-north of Sydney are particularly unequal (Figure 2.7 on page 14). Australia's east coast, and the southern half of Western Australia, are also less equal. These areas tend to have more high-income earners, so there is a bigger gap between their earnings and those of other residents. Regional areas and city suburbs with lower average incomes tend to be more equal.

While inequality has increased in both city and regional areas, it has generally increased a little more towards the centre of capital cities (Figure 2.6 on the following page).

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13. The Gini coefficient – a measure of inequality – for household disposable income increased a little from 0.30 to 0.33 between 2003-04 and 2013-14 (ABS (2015)). Wealth inequality has also somewhat increased – the Gini coefficient for household equalised net wealth increased from 0.57 to 0.61 because of faster growth for the wealthiest households.
14. Wilkins (2017).
15. Wilkins (2016).

Figure 2.5: Disposable incomes increased substantially for all households over a decade
Equivalised household disposable weekly income, 2014$/week
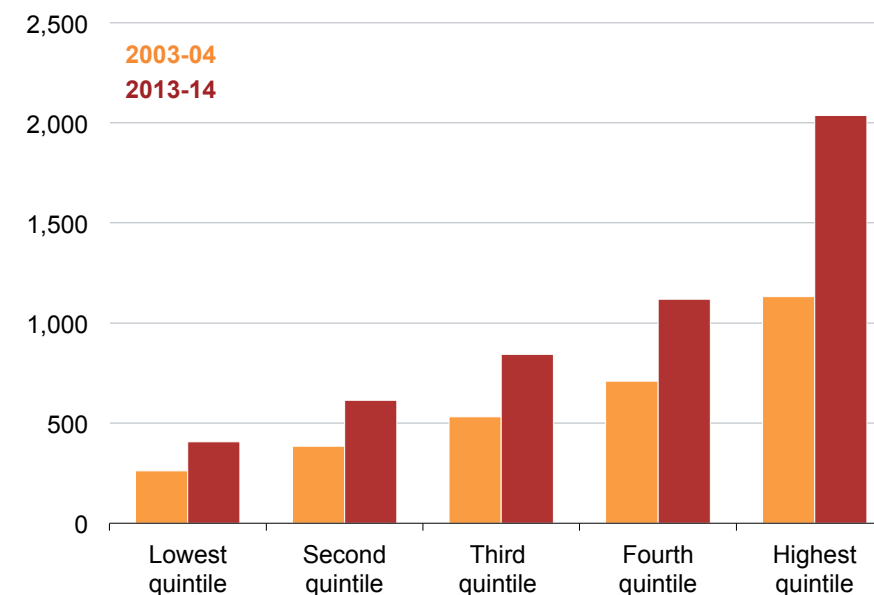
Notes: Lowest income quintile adjusted by the ABS to exclude the first and second percentiles.
Source: ABS (2015); Grattan analysis.

This analysis is based on a comparison of the mean and median taxable income by postcode as reported by the ATO. This reports many regional areas as more unequal than analysis based on the Census.[16] This may be because the ATO data has much more accurate information about high-income earners. On the other hand, the publicly available Census data allows construction of better measures of inequality, such as comparing the incomes of the 80th and 20th percentile.[17]

2.4 Income distribution within states

Regional patterns of income and income growth in each state mirror the national picture: average income per person is higher closer to the state capital but growth rates in income per person are similar, or even slightly higher, in the regions.

In NSW for example, incomes vary across regions. Average taxable incomes in the inner Sydney suburbs exceed $75,000 per year, whereas they are below $50,000 in most areas more than 100 km from the CBD. But the income growth rate per person in regional areas over the past decade was typically higher than in Sydney's outer suburbs, and on par with inner-city growth rates (Figure 2.8 on page 15).

Regional patterns in inequality within states also mirror the national trends. Inequality is higher in all the major capital cities and is increasing in every state. Inequality increased more in areas closer to the CBD in Sydney, Melbourne and Perth. In the other states, changes in inequality were similar in the cities and the regions.

Analysis for each state is provided in Appendix B.

Figure 2.6: Incomes in the regions are more equal and the increase in inequality was less pronounced

Inequality measure (mean/median), 2015

**Change in inequality measure**, ppt, 2004 to 2015

Distance to GPO, km

Notes: A small number of outliers have been excluded to aid readability. The inequality measure is based on the ratio of mean to median income. Higher mean incomes relative to median generally indicate more disparity in income at the upper end of the distribution and therefore greater inequality.
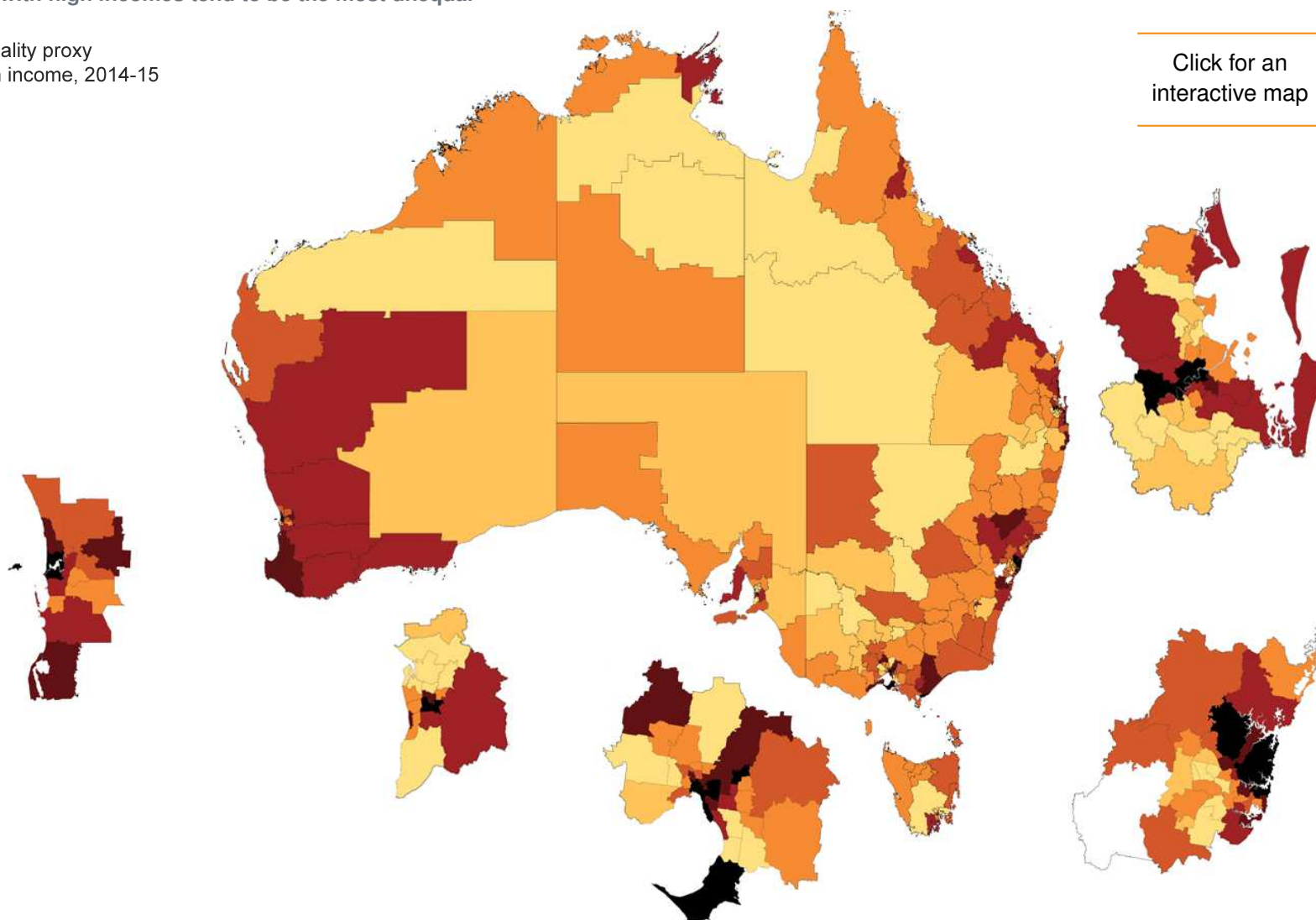
Source: ATO (2017, Table 8); Grattan analysis.

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16. Biddle and Francis (2017).
17. This is the measure used by Biddle and Francis (ibid.).

Figure 2.7: Areas with high incomes tend to be the most unequal

Income inequality proxy
mean/median income, 2014-15
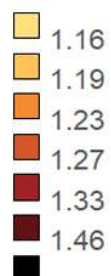
- 1.16
- 1.19
- 1.23
- 1.27
- 1.33
- 1.46

Click for an
interactive map

Notes: Map is coloured by ABS SA3s, and grouped into population-weighted septiles. The outer suburbs of Brisbane have been excluded to aid readability. See Appendix A for a discussion of map methodology. This map has been updated from the original release of this report.

Source: ATO (2017, Table 8); Grattan analysis.

Figure 2.8: Income, income growth and inequality in NSW
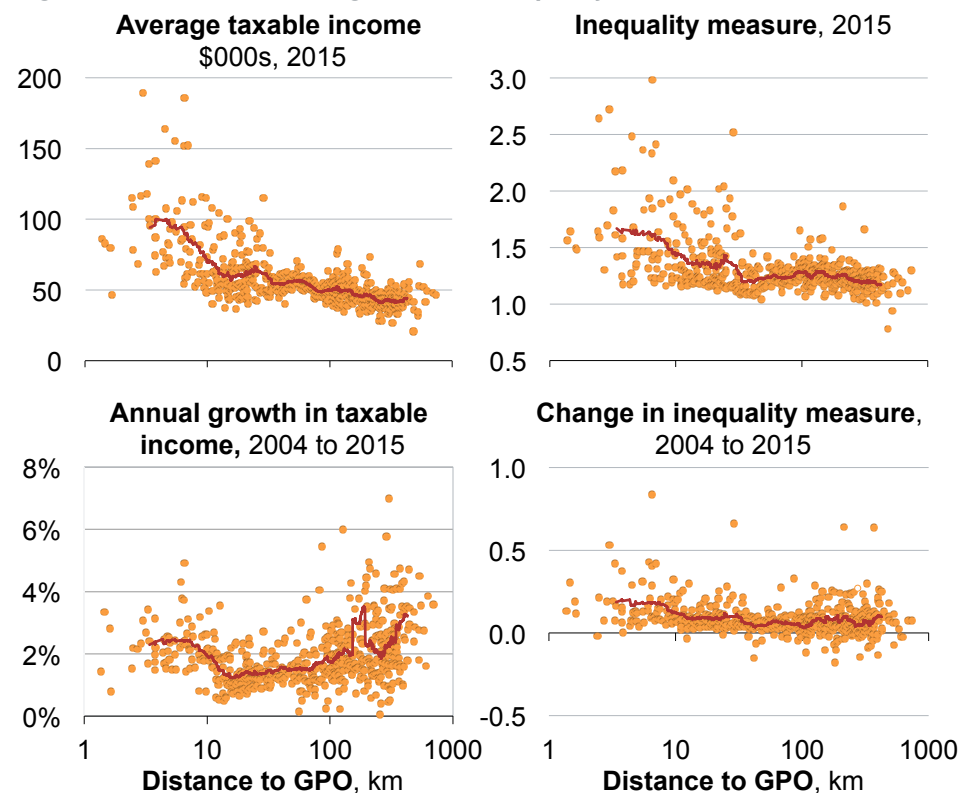
Notes: The growth rate in taxable income is calculated as the CAGR in income per tax filer 2003-04 to 2014-15. Distance is measured as distance to nearest capital city GPO. A small number of outliers have been excluded to aid readability. See the notes under Figure 2.6 on page 13 for more detail on inequality measure.

Source: ATO (2017, Table 8: Median and mean taxable income by state/territory and postcode).

3 Unemployment

While people in cities tend to have higher incomes than people in regions, employment outcomes are not obviously different.

Unemployment rates are highest in areas with relatively large indigenous populations, such as Far North Queensland and remote parts of the Northern Territory.

Unemployment increased over the past five years in a few regional areas. Rural areas around Townsville, and areas around the York Peninsula in South Australia, had below-average unemployment rates in 2011 but above-average rates in 2016.[18] Unemployment rates did not get worse like this elsewhere except in a very small number of city suburbs and regional centres.

3.1 Unemployment rates vary substantially by region

Unemployment tends to be well above the national average in remote regions, particularly those with high indigenous populations: much of the Northern Territory, the Kimberly in northern Western Australia, and outback central Western Australia (below the Pilbara region). Areas of Far North Queensland – including Aurukun, Yarrabah, Palm Island, and Kowanyama to Pormpuraaw – have extremely high unemployment rates: more than 40 per cent, compared to the national average of 6.1 per cent in 2016.

There are also patches of high unemployment in Gippsland in eastern Victoria and on the coast of NSW and southern Queensland. In contrast, some other regions, including south-east NSW and western Victoria, have low unemployment.

In cities, areas of high unemployment tend to radiate out in lines from the CBD, separated by patches of low unemployment in neighbouring suburbs. These "spines" of high-unemployment typically follow the path of major roads, while adjacent less built-up areas have lower unemployment.

3.2 Unemployment has not got obviously worse in regions compared to cities

Overall, unemployment has not got markedly better or worse in regions as opposed to cities over the past five years.

Unemployment did rise significantly in some regional areas, including regions in the York Peninsula in South Australia, in Gippsland in Victoria and around Townsville in Queensland. For most of these areas, increases in unemployment since 2011 have pushed unemployment rates above the national average (Figure 3.2 on page 18).

Unemployment has increased faster in many regional centres than the immediately surrounding rural areas. At the same time, The populations of these regional centres have also tended to grow faster.

In areas that already had high unemployment, unemployment typically got worse over the past five years. For example, unemployment increased by several percentage points in Aurukun, Palm Island and Kowanyama to Pormpuraaw. Unemployment also got worse along many of the city "spines", (see Section 3.1), such as the Ipswich to Carole Park corridor in Brisbane, and the Dandenong to Pakenham corridor in Melbourne. The major exception is the Botany Bay to Liverpool corridor in Sydney, where unemployment remains high but improved over the past five years.
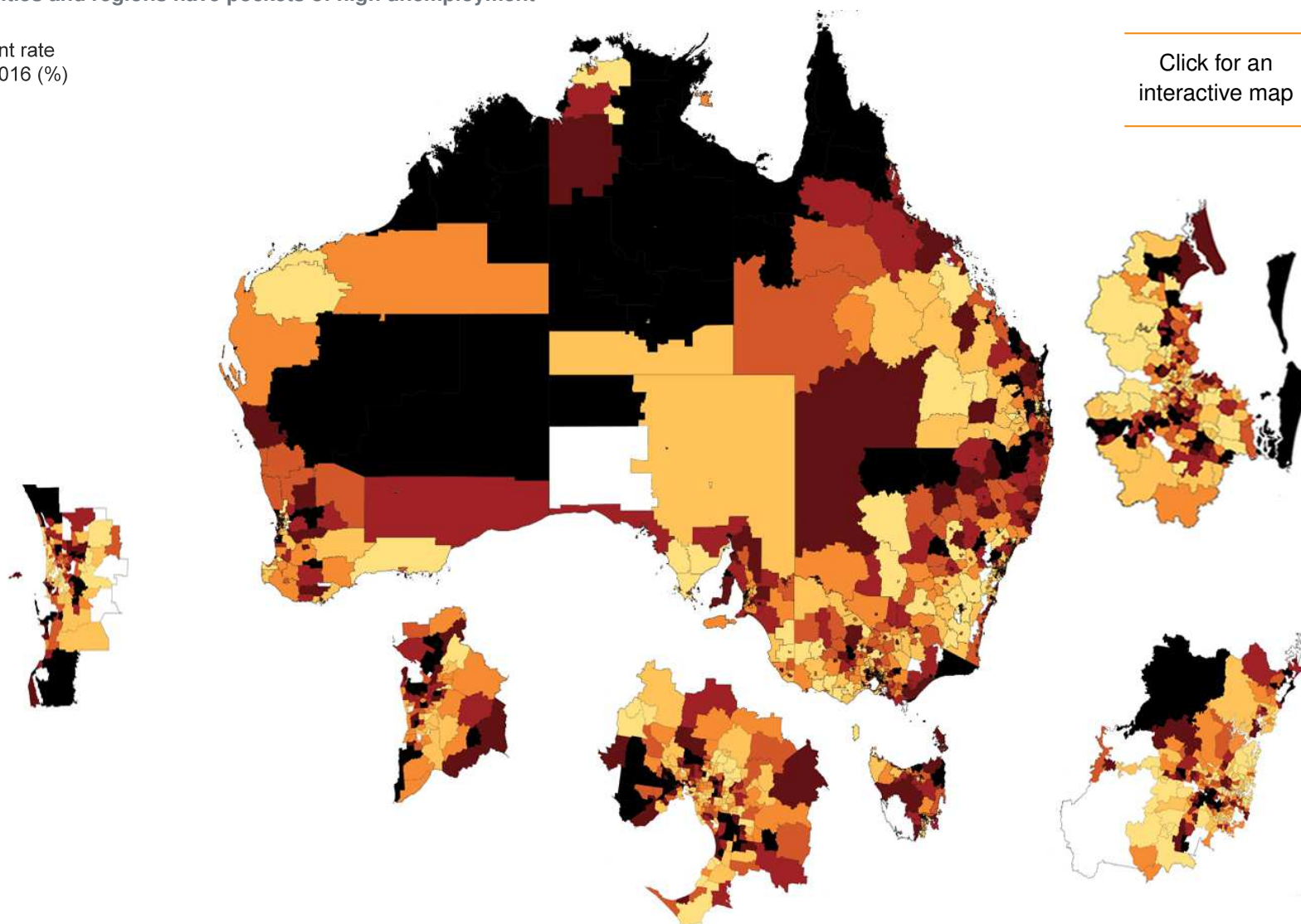
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18. Changes in unemployment are considered over a five-year period because of a lack of comparable regional data over the decade.

Figure 3.1: Both cities and regions have pockets of high unemployment

Unemployment rate
average for 2016 (%)
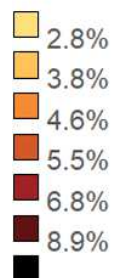
2.8%
3.8%
4.6%
5.5%
6.8%
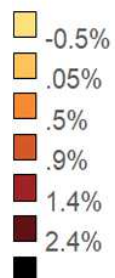8.9%

Click for an
interactive map

Notes: Map is coloured by ABS SA2s, and grouped into population-weighted septiles. The outer suburbs of Brisbane have been excluded to aid readability. See Appendix A for a discussion of map methodology.

Source: Department of Employment (2017a, Table 1); Grattan analysis.

Figure 3.2: Unemployment is not increasing more rapidly in the regions

Change in unemployment rate
percentage point change 2011 to 2016

- -0.5%
- .05%
- .5%
- .9%
- 1.4%
- 2.4%

Click for an
interactive map

Notes: Map is coloured by ABS SA2s, and grouped into population-weighted septiles. The outer suburbs of Brisbane have been excluded to aid readability. See Appendix A for a discussion of map methodology.
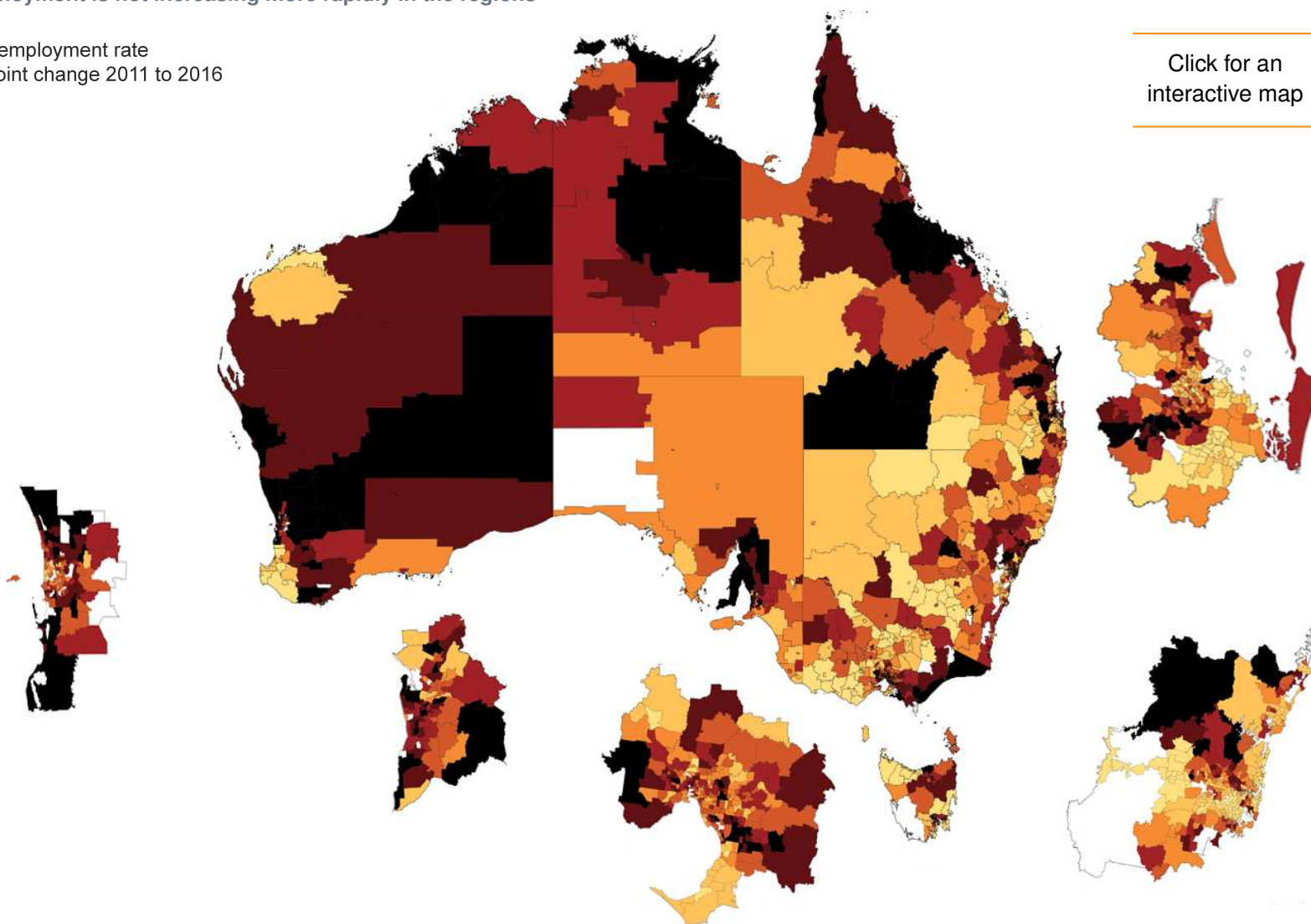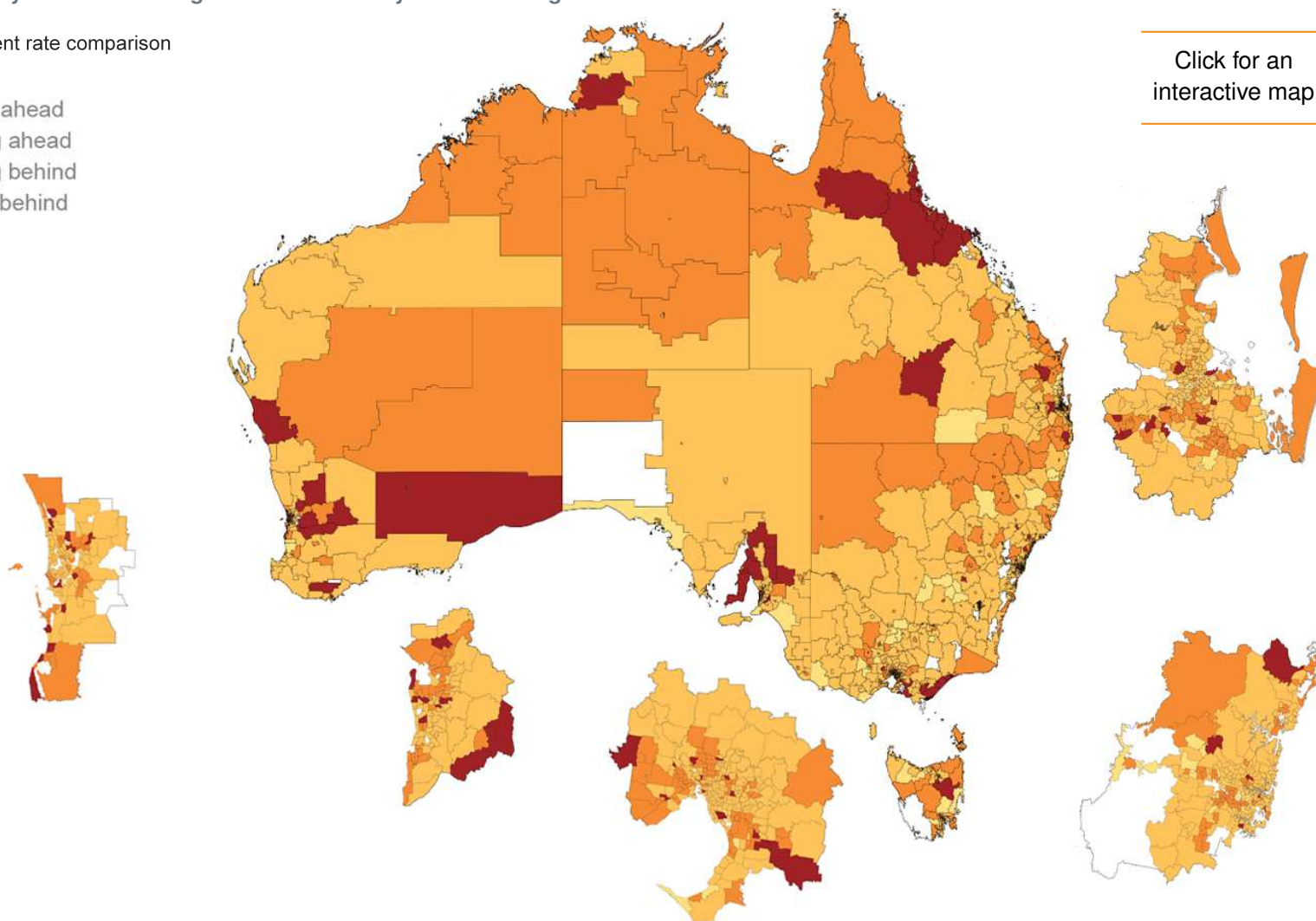
Source: Department of Employment (2017a, Table 1); Grattan analysis.

Figure 3.3: Unemployment in some regional areas and city suburbs has got worse since 2011

Unemployment rate comparison
2011 to 2016

Pulling ahead
Staying ahead
Staying behind
Falling behind

Click for an
interactive map

Notes: Map is coloured by ABS SA2s. Regions are categorised by the change relative to average unemployment in 2011 and 2016. Regions that are "Pulling ahead" had above average unemployment rates in 2011 and below average unemployment rates in 2016. Regions that are "Staying ahead" or "Staying behind" have always had below or above average unemployment rates, respectively. Areas that are "Falling behind" had below average unemployment rates in 2011, and above average unemployment rates in 2016. See Appendix A for a discussion of map methodology.

Source: Department of Employment (2017a, Table 1); Grattan analysis.

4 Population growth and demographics

The most densely populated parts of Australia – mostly within the capital cities – house 80 per cent of the population (Figure 4.3 on page 22). They occupy less than 1 per cent of Australia's land mass. Another 10 per cent of the population live around the capital cities, along the east coast, and in regional Victoria north east of Melbourne. The remaining 10 per cent live in more sparsely populated areas that cover 77 per cent of Australia.
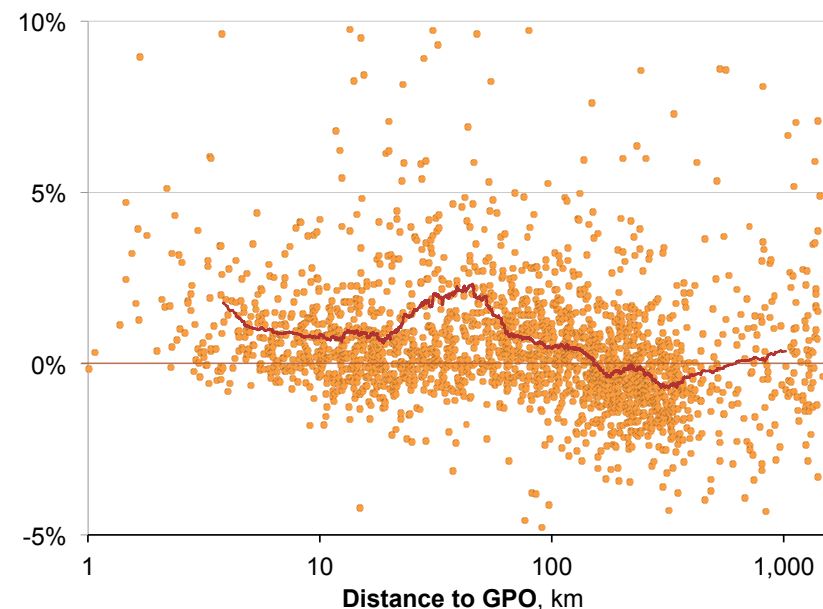
4.1 Population growth is faster in the cities

Over the past decade population has grown faster in the cities. Suburbs within 5 km of the city centre have very high average growth rates (Figure 4.1).[19] Population also grew particularly quickly in some postcodes on the fringes of capital cities (20 km to 50 km from the city centre), with housing estates being built on what was previously farmland.

By contrast, populations tended to grow slower in areas more than 100 km from a major city, and, based on tax data, the population is declining in most postcodes more than 130 km from capital city centres.

These patterns are obvious when looking at the population growth of an individual State. In Victoria, for example, the population grew quickly over the last decade in most postcodes within 10 km of Melbourne's GPO (Figure 4.2 on the following page). Population grew much more

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19. This chapter uses Census data for population numbers. The exception is population growth by distance to CBD (Figures 4.1 and 4.2 on the current page and on the following page) for which we use ATO data on number of people filing a tax return as a proxy for population because Census data is less easy to summarise this way. The main inaccuracy in using tax filers as a proxy for population is that it understates populations in areas with more children, such as new suburbs on capital city fringes, and in areas with many full Age Pensioners, such as coastal retiree towns. See Appendix A.3 on page 35 for more detail.

Figure 4.1: Population grew faster in areas close to capital city centres
Average annual growth in number of taxable individuals, 2003-04 to 2014-15

Notes: The growth rate is calculated as the CAGR in the number of individuals filing a tax return 2003-04 to 2014-15. A small number of outliers have been excluded from the chart to aid readability.

Source: ATO (2017, Table 8); Grattan analysis.

slowly in established suburbs 10 to 20 km from the city centre. In suburbs more than 20 km away, the population grew slowly if the suburb was already well-established, but very fast if it was a greenfield development. Although the population did grow rapidly in a few postcodes more than 120 km from Melbourne, the population of most regional postcodes shrank.

Patterns of growth vary across cities according to topography and urban planning. Sydney is constrained by the Hawkesbury River and the Ku-ring-gai Chase National Park to the north, the Blue Mountains to the west, and the Royal National Park in the south. Consequently, Sydney's population has grown fastest in the west and south-west, in residential greenfield developments around Penrith and Campbelltown. Melbourne is less constrained by topography and so its population grew rapidly in greenfield areas all around the city, including Werribee to the west, Craigieburn to the north, and Officer in the south-east (see Figure 4.4 on page 23).

Population growth was distributed more evenly in Perth, Brisbane and Adelaide, perhaps because urban development is less constrained in these cities.

In general, regional areas have had little population growth over the past decade. The major exceptions are regional areas immediately surrounding large capital cities, south-east coastal areas such as the central coast of NSW, and the major population centres on and near the eastern coast of northern Queensland from Gladstone to Cairns. Population also grew relatively quickly in some inland centres that are within 150 km of capital cities such as Ballarat and Bendigo.

At a more micro level, many regional centres have grown at the expense of the smaller towns and rural areas immediately around them.

Figure 4.2: Population grew faster in areas close to Melbourne
Average annual growth in number of taxable individuals, 2003-04 to 2014-15, Victoria
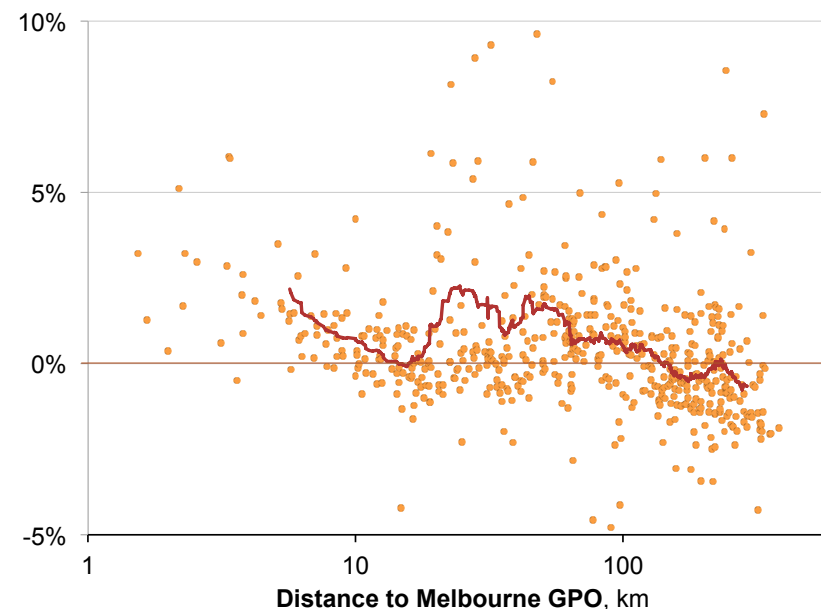
Notes: The growth rate is calculated as the CAGR in the number of individuals filing a tax return 2003-04 to 2014-15. A small number of outliers have been excluded from the chart to aid readability.
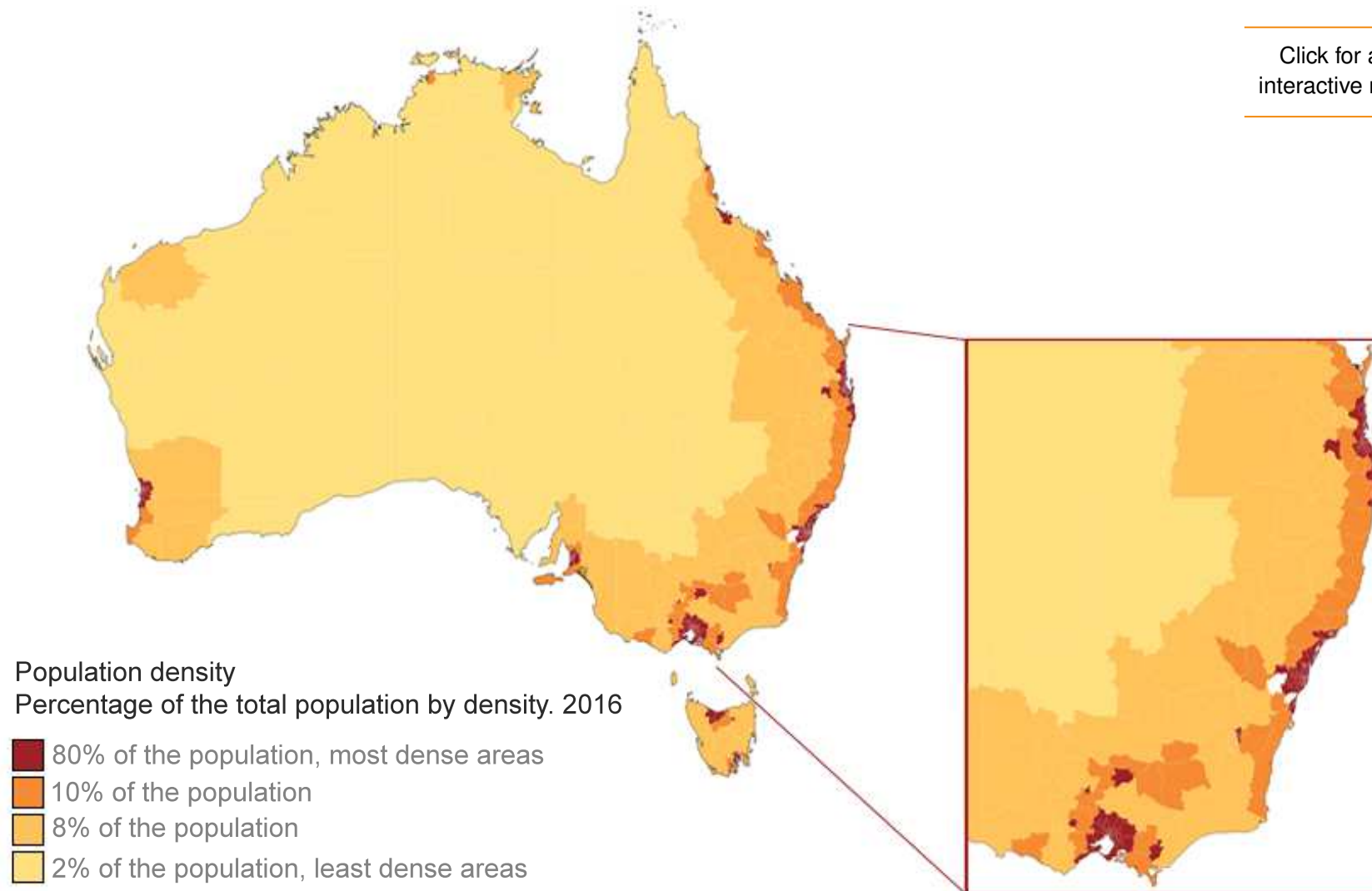
Source: ATO (2017, Table 8); Grattan analysis.

Figure 4.3: Australia's population is concentrated in the major cities and surrounding suburbs

Click for an
interactive map

Population density
Percentage of the total population by density. 2016

■ 80% of the population, most dense areas
■ 10% of the population
■ 8% of the population
□ 2% of the population, least dense areas

Notes: Map is coloured by ABS SA3s density: 80 per cent of the population lives in the most dense, dark red areas; a further 10 per cent lives in the next most dense, orange areas; another 8 per cent lives in the less dense, dark yellow areas; and the remaining 2 per cent of the population lives in the least-dense, light-yellow areas.

Source: ABS (2017c).

Figure 4.4: Population growth is highest in capitals, the regions around them, mining areas, and along the coast

Click for an
interactive map

Population growth
2006 to 2016 (%)

0   0.6   1   1.3 1.5 1.9 2.9
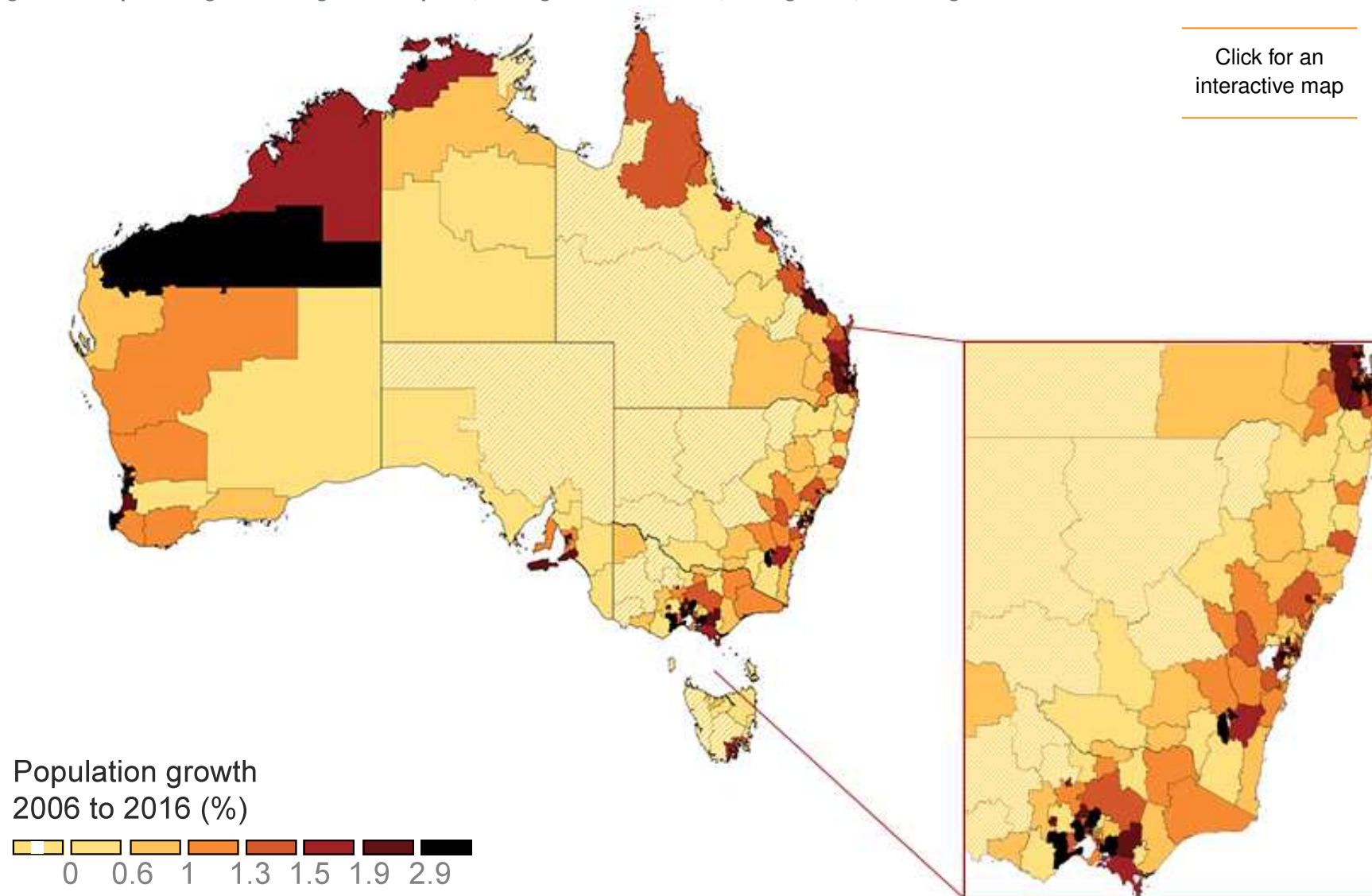
Notes: The growth rate is calculated as the CAGR in population 2006 to 2016. Map is coloured by ABS SA3s, and grouped into population-weighted septiles. See Appendix A for a discussion of map methodology. Visit https://www.grattan.edu.au/publications/maps-regional-patterns/ or click image above to see a more detailed version of this map.

Source: ABS (2017d).

4.2   Most immigrants live in the cities, some go to mining areas

Most immigrants to Australia settle in the major cities. The proportion of the population born overseas in cities is much higher than in regional and remote regions (Figure 4.5). International students are the largest single group of visa holders in cities (except for Perth, where most are on 457 visas). In regional Australia, they are usually on working holiday visas.[20]

Immigrants are most concentrated in the western suburbs of Sydney, and in Melbourne's outer ring. In some of these areas, more than half the residents were born overseas (Figure 4.6 on the next page).

Mining areas also attract immigrants. About one in five residents in the Pilbara in Western Australia were born overseas.

Migrants are also a relatively high percentage of the population along parts of the east coast, including Cairns, Port Douglas, Townsville, Hamilton Island, the Atherton Tablelands, and the south coast of NSW.[21]

Overseas-born residents are the smallest proportion of the population in remote NSW: less than 5 per cent of the population of Broken Hill, Bourke, and Moree were born overseas.

Figure 4.5: Most immigrants settle in the major cities
Population by country born and region, millions people, 2016
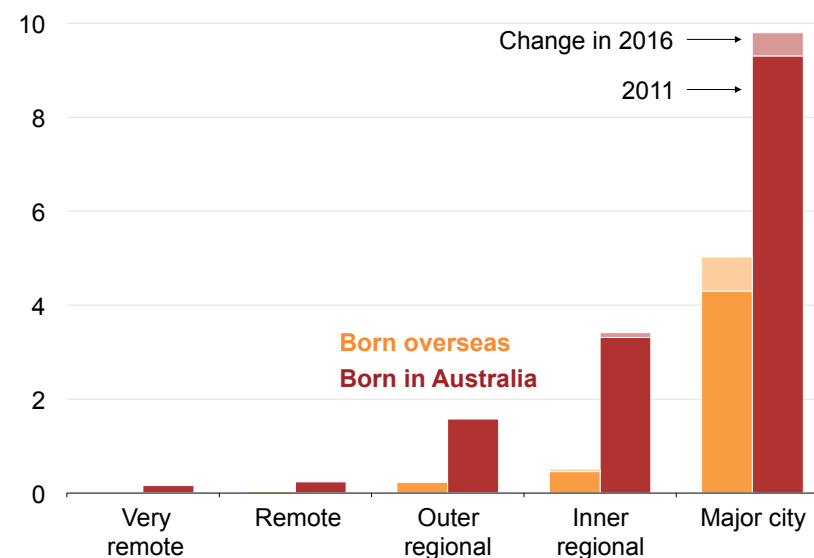
Notes: As 2016 Remoteness Areas have not been released for the latest census, immigration data has been converted from 2016 SA2s to 2011 Remoteness Area Levels using correspondences provided by the ABS. (ABS (2017e)). Numbers are indicative only.
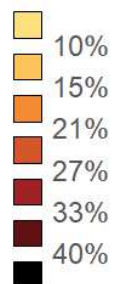
Source: ABS (2017d).

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20. Department of Immigration and Border Protection (2014).
21. For a more detailed discussion of the contribution of international and internal migration patterns to population growth, see Hugo et al. (2015).
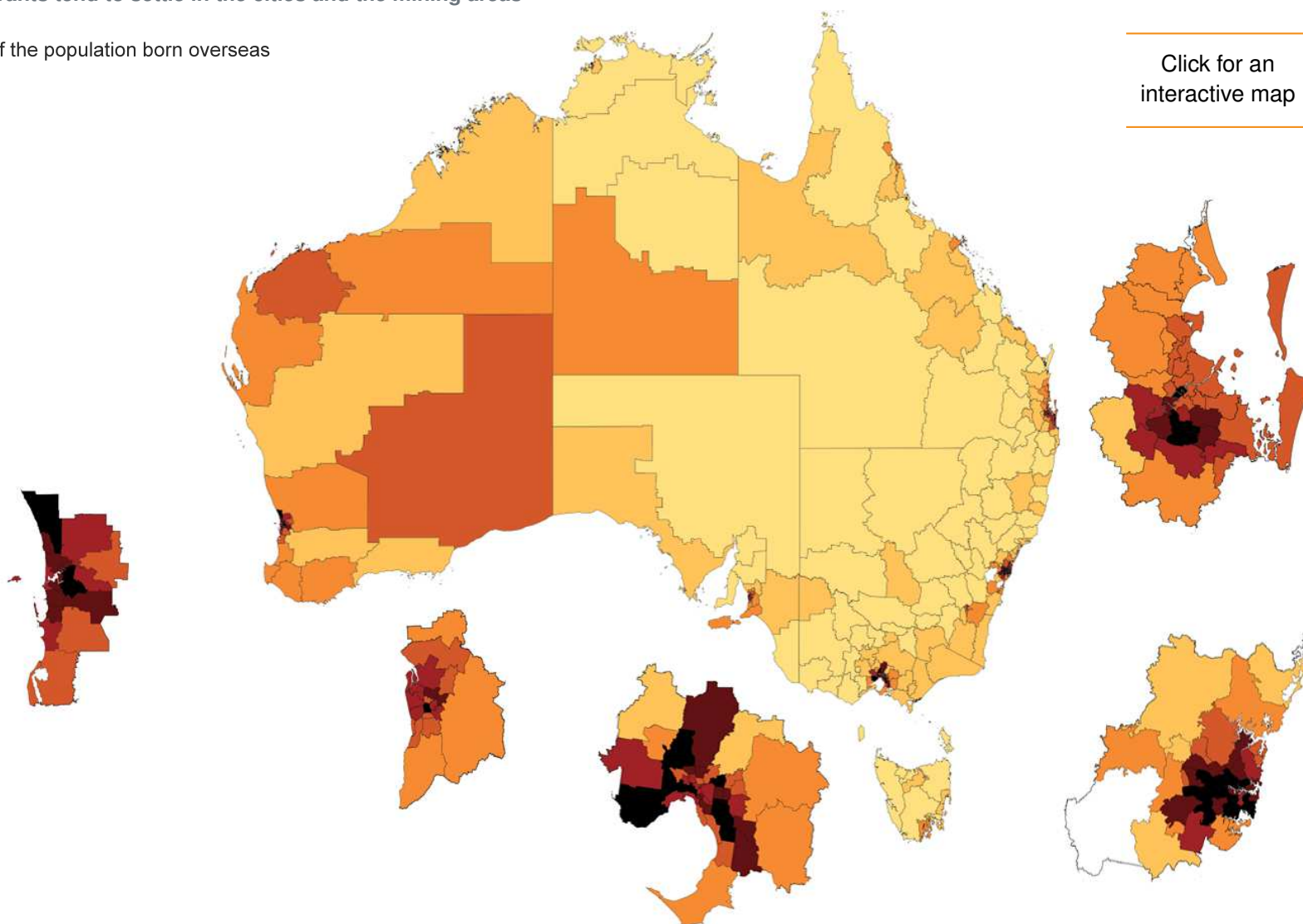
Figure 4.6: Immigrants tend to settle in the cities and the mining areas

Percentage of the population born overseas
2016

Click for an
interactive map

Notes: Map is coloured by ABS SA3s, and grouped into population-weighted septiles. The outer suburbs of Brisbane have been excluded to aid readability. See Appendix A for a discussion of map methodology.

Source: ABS (2017c).

4.3 Culturally and linguistically diverse immigrants are most likely to live in cities

Around 12 per cent of Australia's total population was born in the UK, North America or Europe, compared to 8 per cent in Asia and 2 per cent in Africa and the Middle East.[22]

People with different origins tend to settle in different areas. People from English-speaking countries and Europe are more spread out across Australia than other immigrant groups (Figure 4.7 on the following page). They are most concentrated in the outer coastal suburbs of Perth, such as Joondalup and Rockingham, and in Manly and parts of the eastern suburbs in Sydney. English-speaking and European migrants comprise more than a quarter of the population in these areas. There are also relatively high concentrations of such immigrants in almost all of WA's regions, the south coast of NSW, the Gold Coast, and in Melbourne's satellite cities of Geelong, Ballarat, and Bendigo.

People from Asia are most concentrated in the heart of the major cities and in suburbs such as Auburn and Parramatta in Sydney's west and Dandenong in Melbourne's south-east (Figure 4.8 on page 28). In these areas, people born in Asia account for more than a third of the population. In the regions, there are more Asian migrants in the Pilbara, Darwin and Cairns. There are also relatively high concentrations in Shepparton, Griffith and parts of Canberra.

People from Africa and the Middle East are most concentrated in city suburbs such as Tullamarine and Broadmeadows in Melbourne (16 per cent of the population), and Merrylands and Fairfield in Sydney (14 per cent) (see Figure 4.9 on page 29). Few regional areas have significant populations born in Africa and the Middle East. Even where there are more – Shepparton in Victoria and Toowoomba in Queensland – such migrants are less than 3 per cent of the population.
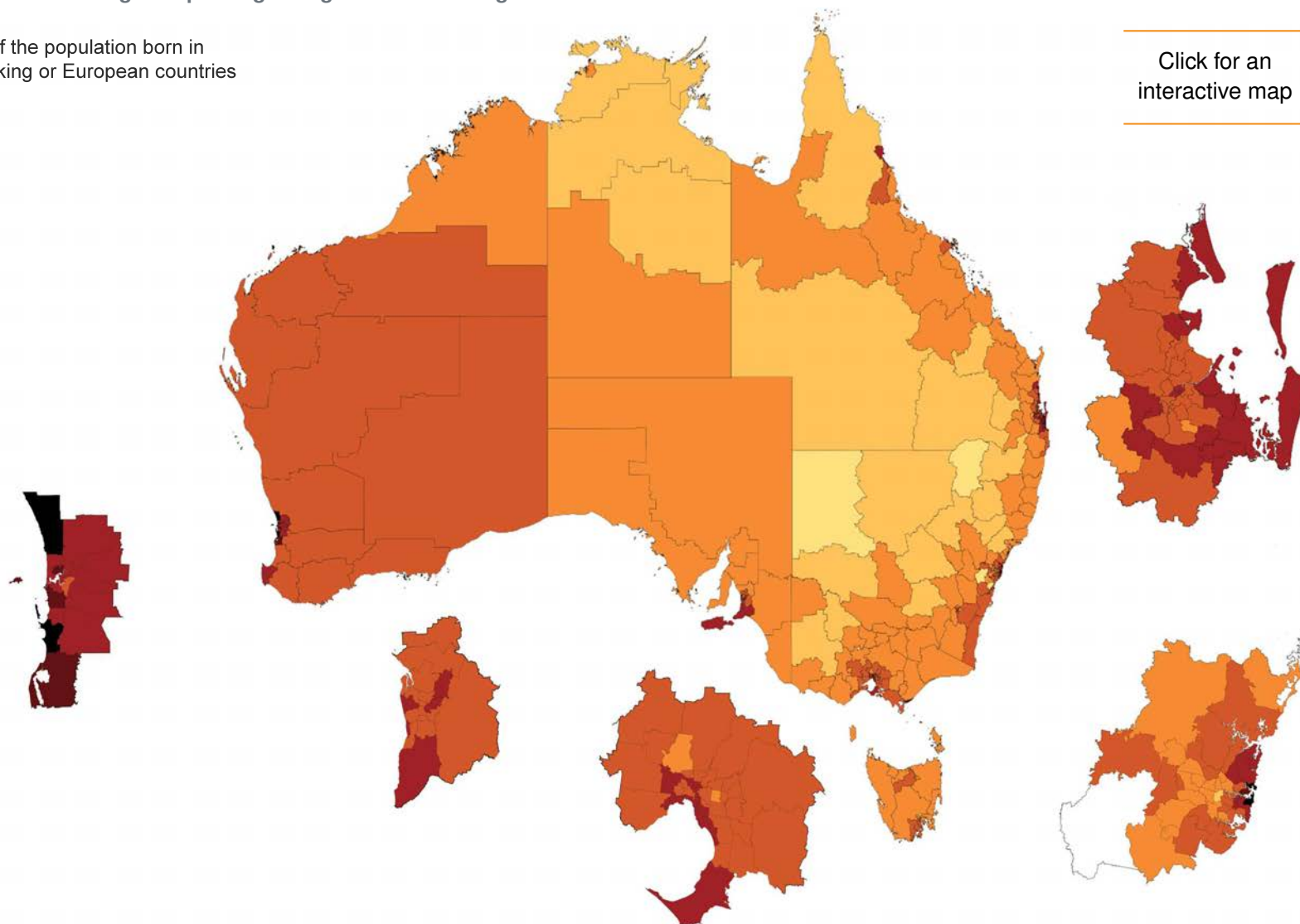
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22. ABS (2017c).

Figure 4.7: Europeans and English-speaking immigrants move to regional areas as well as cities

Percentage of the population born in
English-speaking or European countries
2016
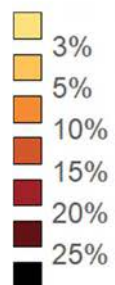
3%
5%
10%
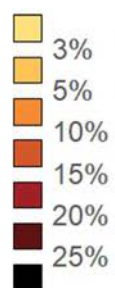15%
20%
25%

Click for an
interactive map

Notes: Map is coloured by ABS SA3s. The outer suburbs of Brisbane have been excluded to aid readability. See Appendix A for a discussion of map methodology.
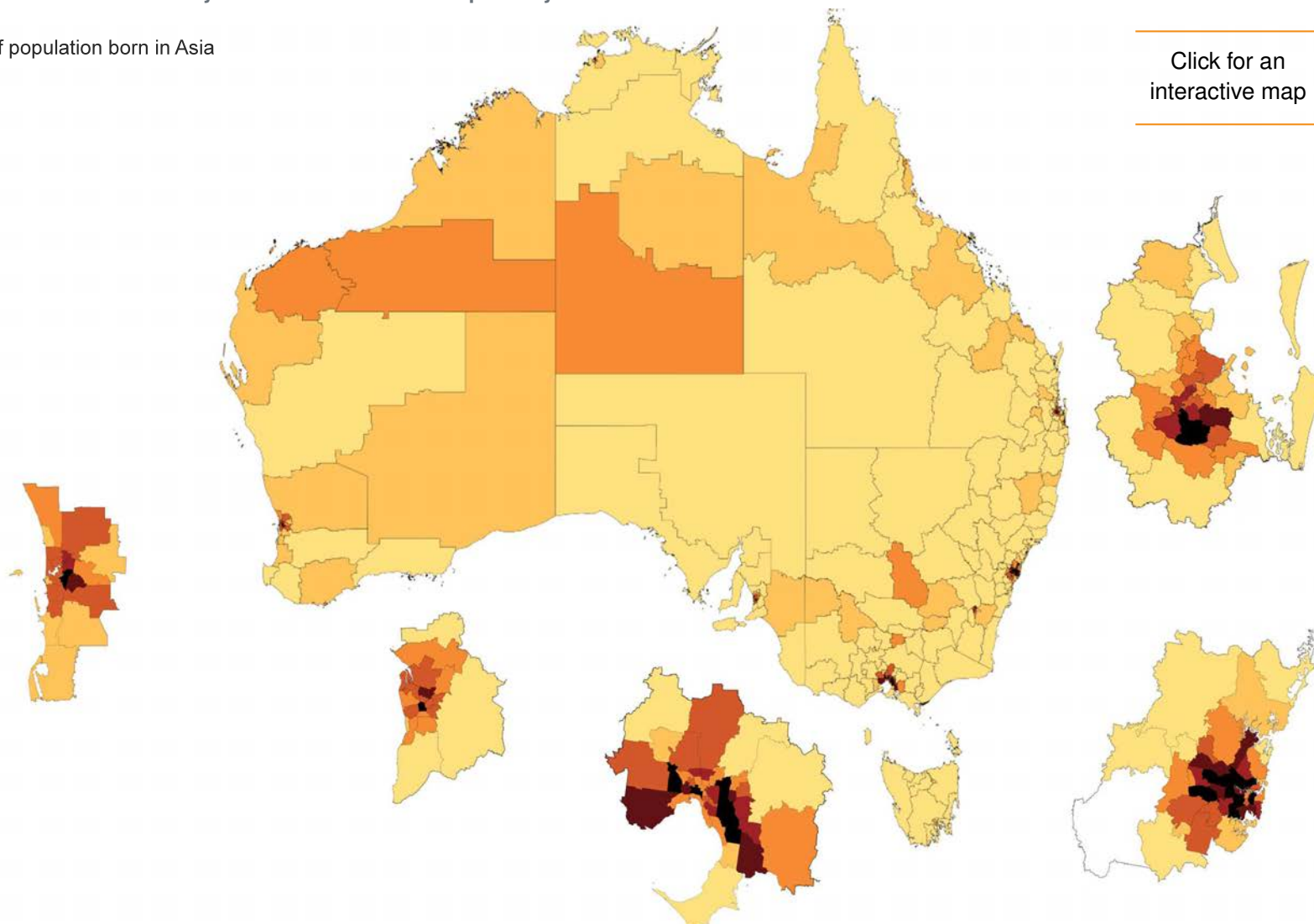
Source: ABS (2017c); Grattan analysis.

Figure 4.8: Asian communities are very concentrated in some capital city suburbs

Percentage of population born in Asia
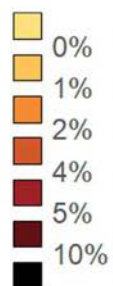2016

3%
5%
10%
15%
20%
25%

Click for an
interactive map

Notes: Map is coloured by ABS SA3s. The outer suburbs of Brisbane have been excluded to aid readability. See Appendix A for a discussion of map methodology.
Source: ABS (2017c); Grattan analysis.

Figure 4.9: People born in Africa and the Middle East are concentrated in a small number of capital city suburbs

Notes: *Map is coloured by ABS SA3s. The outer suburbs of Brisbane have been excluded to aid readability. See Appendix A for a discussion of map methodology.*
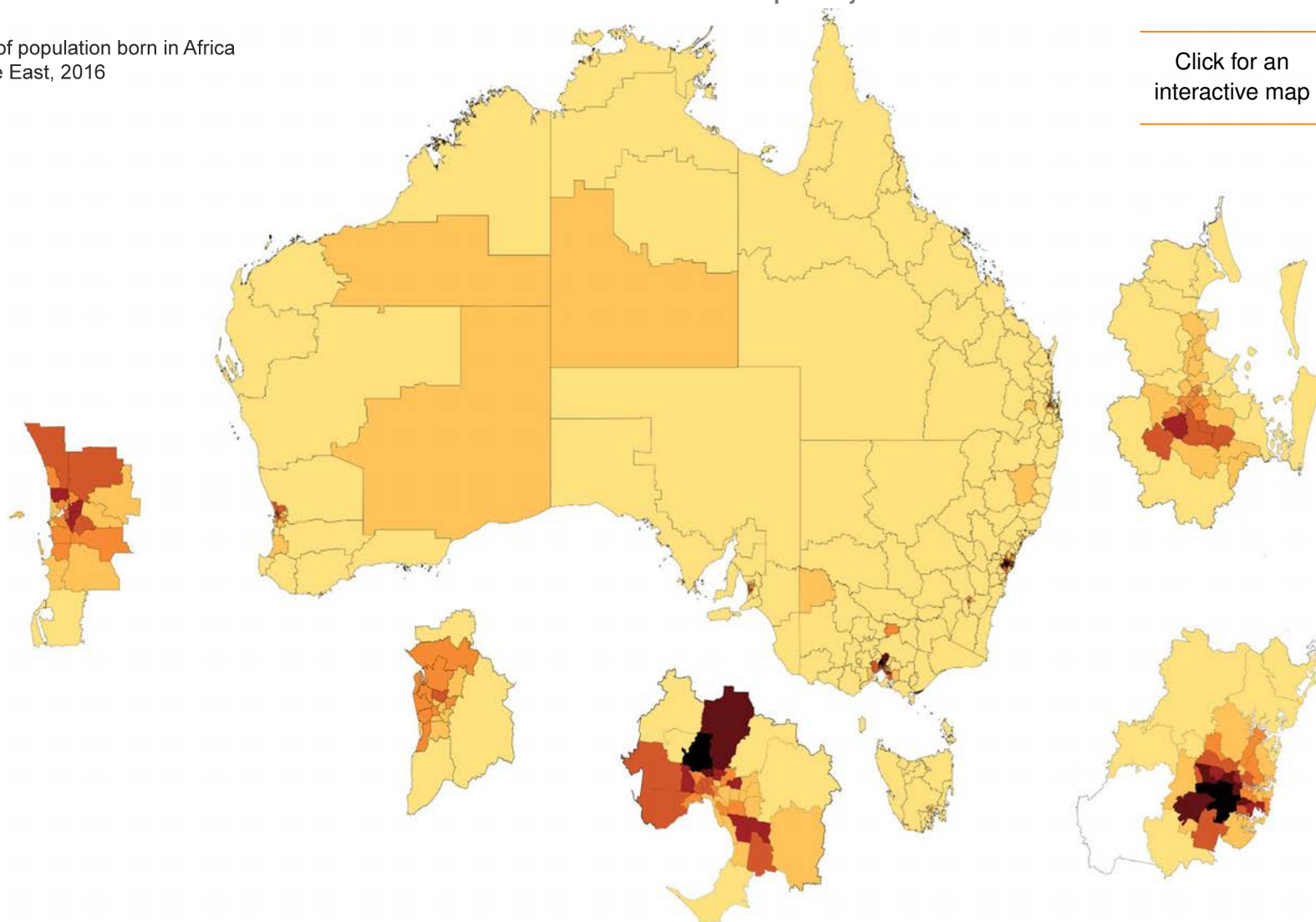Source: *ABS (2017c); Grattan analysis.*

5 Education and age

People living in cities tend to have higher levels of education than those living in regions. Those living in regions also tend to be older, particularly along the south coast of NSW.

5.1 Cities have a higher percentage of tertiary-educated people

More people have higher levels of education in major cities and areas along the east coast. In the harbour-side suburbs of Sydney, the inner-eastern suburbs of Melbourne, central Brisbane, Mitcham in Adelaide, the inner-northern suburbs of Perth, and Canberra, more than half the adult population has a degree or diploma. Tertiary education rates are also high in the Blue Mountains in NSW and the Yarra Valley in Victoria (Figure 5.1 on the next page).

Some city suburbs have very low levels of tertiary education. Of these, some have a high percentage of immigrants (Section 4.2 on page 24). Fairfield in Sydney, and Brimbank and Broadmeadows in Melbourne, have among the lowest rates of tertiary education for city suburbs. More than 40 per cent of the population in these suburbs was born overseas.

Tertiary education rates are relatively high on the south coast of NSW, and in regional coastal cities such as Coffs Harbour, Townsville and Cairns, where between 40 to 50 per cent of the adult population has a tertiary degree, much higher than most of the rest of regional Australia. Tertiary education rates are also high in and around Armidale, where the University of New England is a big employer.[23]

Compared to the levels of education along the east coast, tertiary education rates in mining areas are low. In Western Australian and Queensland mining areas, tertiary education rates tend to be between

30 and 36 per cent. The Pilbara region in WA is an exception, with 43 per cent of the adult population tertiary educated.

The lowest rates of tertiary education in the country are in the Northern Territory, where only one in four adults holds a degree or diploma.

## 5.2 Regional NSW and regional Victoria have older populations

The population is generally older in sea-change destinations such as the coast of NSW beyond the Wollongong to Newcastle strip, the coast of Victoria, the Gold and Sunshine coasts in Queensland, and much of the South Australian coast. The population is also relatively old in regional Victoria (except for the cities of Bendigo and Ballarat) and the wheat belt of Western Australia (Figure 5.2 on page 32).
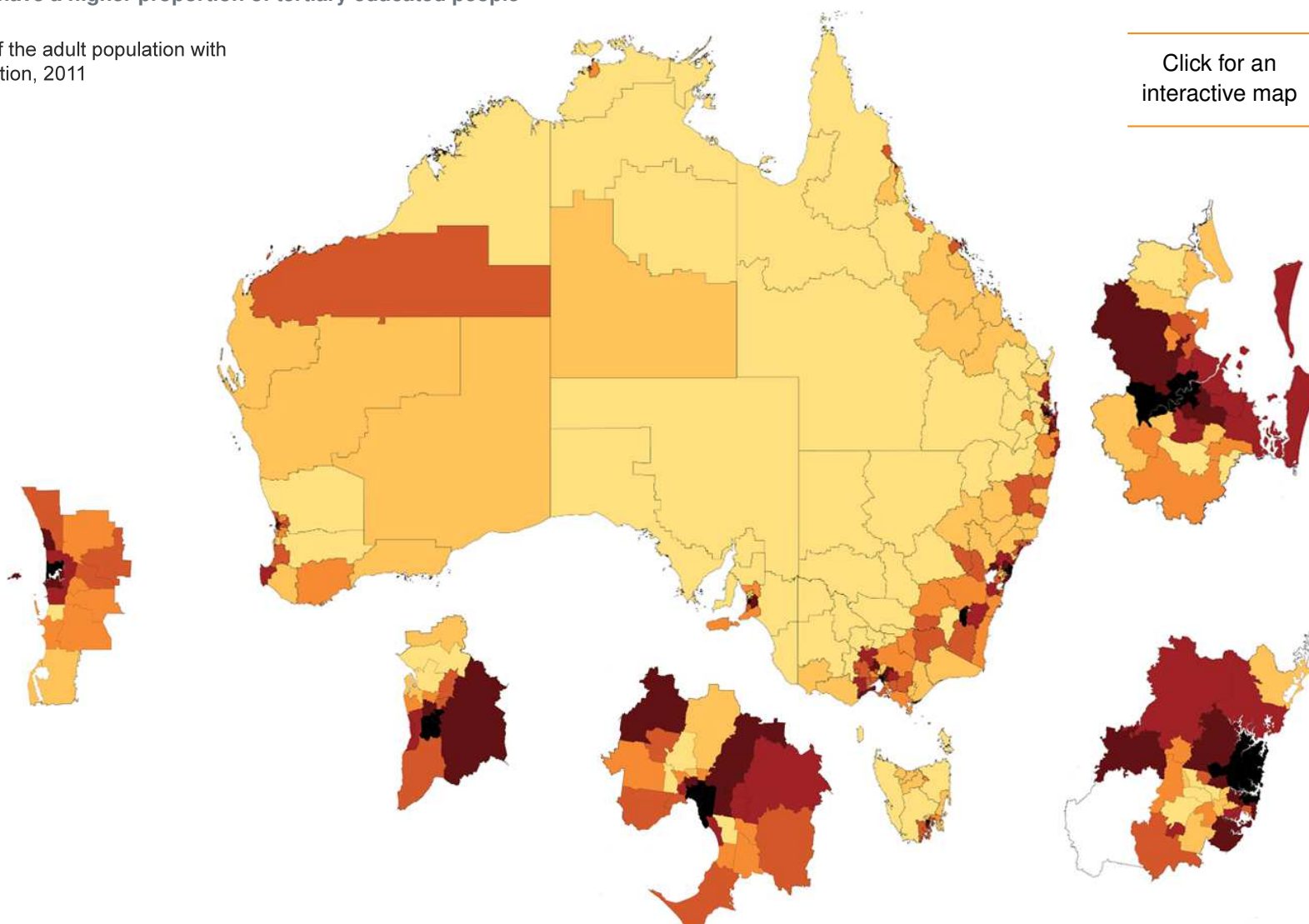
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23. Daley and Lancy (2011, p. 30).

Figure 5.1: Cities have a higher proportion of tertiary educated people

Percentage of the adult population with
tertiary education, 2011
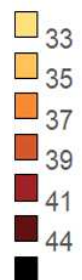
36%
40%
42%
45%
50%
55%
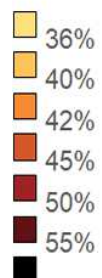
Click for an
interactive map

Notes: Percentage of the population over 15 with tertiary education. Map is coloured by ABS SA3s, and grouped into population-weighted septiles. The outer suburbs of Brisbane have been excluded to aid readability. See Appendix A for a discussion of map methodology.

Source: ABS (2011).

Figure 5.2: Regional NSW and regional Victoria have older populations than the rest of the country

Median age
2016

33
35
37
39
41
44

Click for an interactive map

Notes: Map is coloured by ABS SA3s, and grouped into population-weighted septiles. The outer suburbs of Brisbane have been excluded to aid readability. See Appendix A for a discussion of map methodology.
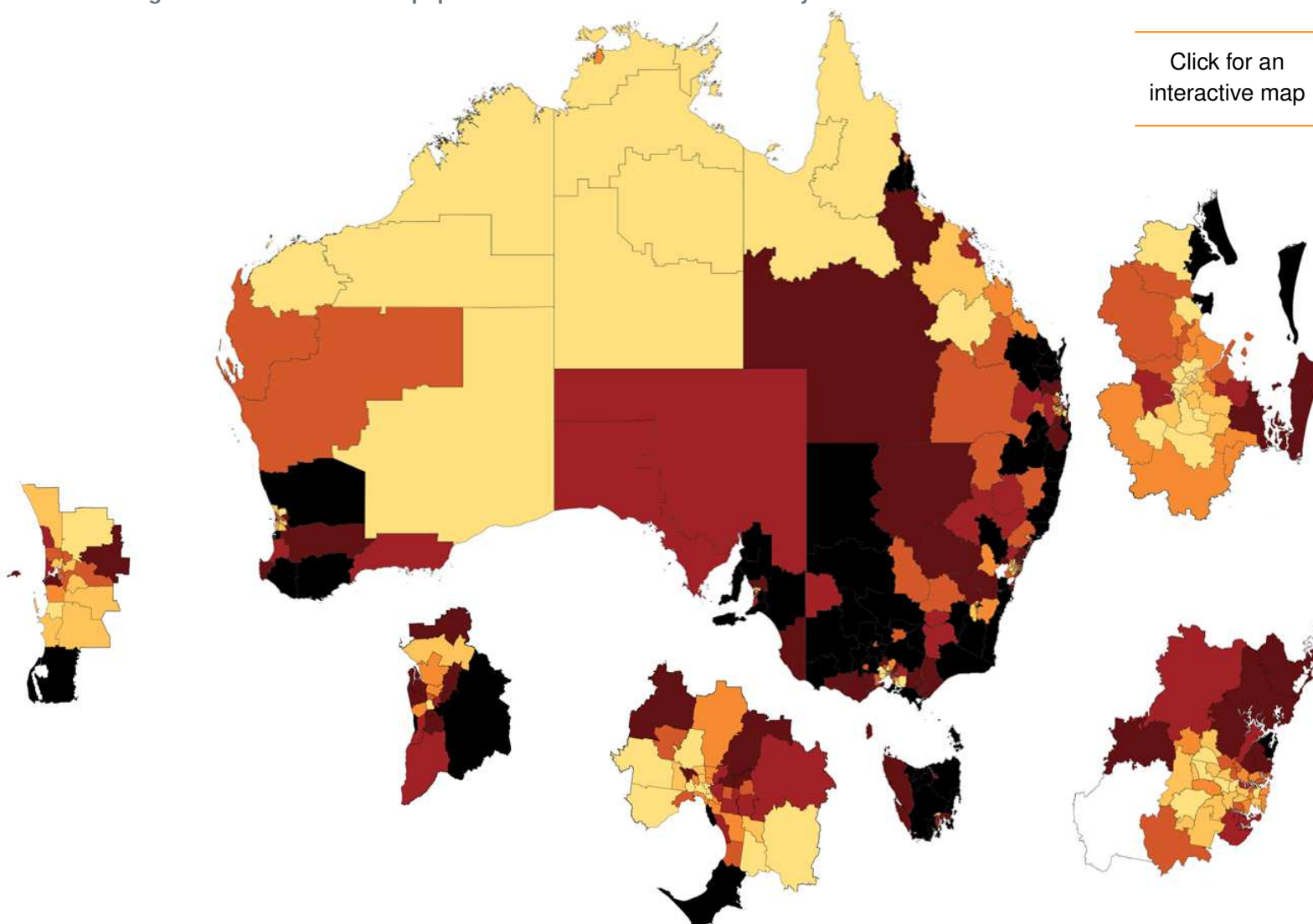
Source: ABS (2017c).

Appendix A: Data sources and methodology

This appendix sets out the data sources and methodology for the maps in the body of this paper.

For a description of population-weighted septiles (used by many of the maps in this paper), see Box 1.

A.1 Income and income growth

Figures 2.1 to 2.8 on pages 8–15, and state-based figures in Appendix B

These maps and charts present average taxable income per tax filer in 2014-15, and the growth rate in income per tax filer between 2003-04 and 2014-15.

They are based on Australian Taxation Office taxation statistics by post-code.[24] They aggregate individual tax returns. The postcode is typically the permanent place of residence or the postal address disclosed on the tax return.

Mean personal taxable income is for the 2014-15 financial year. It mainly comprises salary and earnings on investments, and also includes government allowances, and some scholarships, less allowable tax deductions.

It might be thought that incomes of regional areas may be understated somewhat by tax data if a greater proportion of household costs are paid through businesses. But the Census data is broadly similar,[25] except that it reports lower incomes in Far North Queensland, remote NSW, and south-western WA (perhaps because of difficulties in data collection, and accounting for FIFO mining workers by their location on

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24. ATO (2017, Table 8).
25. For comparable maps, see Biddle and Francis (2017).

Box 1: Population-weighted septiles

Many maps in this paper use population-weighted septiles. This calculates the cut-off points for each of the colour breaks in the maps such that the number of people in each colour category is roughly similar. As the characteristics of each region vary (be they SA2s or SA3s), this produces different break points than if the septiles were calculated for the population as a whole.

To calculate the breaks for a population weighted septile, the SA2 or SA3 regions were sorted by the variable of interest. Breaks for each septile were then chosen so that each group of regions had roughly similar population.

Maps that exclude certain cohorts of the population (for example, people younger than 15 years old in the higher education maps) were weighted by the population of each region excluding that cohort.

Census night rather than permanent place of residence). Tax data is much more accurate for higher incomes.

Growth in taxable income is calculated as a compound annual growth rate from the 2003-04 financial year to the 2014-15 financial year. Nominal income for the 2003-04 financial year was adjusted to real 2014-15 dollars, using a yearly average of ABS quarterly data on the Consumer Price Index, starting from the 2003 September quarter.[26]

The inequality measure is calculated as the ratio of mean to median taxable income for each region. Higher mean incomes relative to median generally indicate more disparity in income at the upper end of the distribution compared to the middle and therefore greater inequality. This is the only inequality measure it is possible to calculate from the publicly available ATO data.

Alternative inequality measures such as the Gini coefficient[27] or the P80/P20 ratio[28] provide a better indication of the relative distribution of incomes. However, these measures can only be calculated using Census data. Income estimates from the Census are self-reported rather than officially declared income and are truncated at the top end because incomes are reported in bands. Regional distribution of inequality using the P80/P20 ratio measure can be found at Biddle and Francis (2017). The broad finding is the same: intra-region inequality is lower in regional areas than in the major cities.

Postcode data was transformed to Statistical Area Level 3 (SA3) geographies as described in Box 2. These were imported to the mapping program, Carto, using geometry data provided by the ABS.

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26. ABS (2017f, Series A2325846C).
27. Gini coefficient is used to measure the inequality of income distribution. The coefficient ranges between zero (perfect equality) and one (complete inequality – all of the income is received by a single person).
28. P80/P20 is the ratio of income for a person at the 80th percentile compared to a person at the 20th percentile of the income distribution.

Box 2: What is a Statistical Area Level?

The Australian Statistical Geography Standard is a framework developed by the ABS to allow the comparison and integration of spatial data.[a]

Most of the maps in this working paper use Statistical Area Level 3 (SA3) data. SA3s contain between 30,000 and 130,000 people. They are designed by the ABS to represent communities that have similar regional characteristics. Statistical Areas Level 2 – used in this paper for the unemployment maps – are generally smaller geographies and contain 3,000 to 25,000 people.

Postcode-level data (such as ATO tax data) is transformed to SA3s using correspondence data provided by the ABS. Where postcodes overlap more than one SA3, data is allocated between the SA3s, weighted by the area of overlap.[b]

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a. ABS (2017e).
b. Reported postcodes in the taxation statistics data are assumed to be equivalent to Postal Area (POA) codes as calculated by the ABS. The boundaries of Australia Post postcodes are not well-defined. Some POA codes included in the SA3 correspondence data are not listed as postcodes in the taxation statistics data. Where this is the case, the missing POA codes have been removed from the calculations, and weighted data for the remaining POA codes used to estimate SA3 numbers.

Darker colours represent higher incomes, or higher growth, relative to other areas.

A.2   Employment

Figures 3.1 to 3.3 on pages 17–19

These maps present unemployment rates in 2016, changes in unemployment rates between 2011 and 2016, and changes in unemployment rates relative to initial unemployment rates in 2011.

They are based on data from the Department of Employment, which combines three sources:[29]

1. The current number of recipients of Youth Allowance and Newstart Allowance who are on a non-zero payment, and not receiving the Community Development Employment Projects Participant Supplement, by SA2;

2. The ABS Labour Force Survey, which samples about 26,000 private and non-private dwellings across Australia and provides labour force statistics by SA4; and

3. Participation rate data from the 2011 Census of Population and Housing, at an SA2 level

Taken together, these methods are based on the Department's SPREE methodology, which links Centrelink data to the ABS Labour Force Survey to generate small-area estimates of labour force statistics.

Unemployment rates are calculated as the proportion of the labour force that is actively seeking work, but not in work. The estimates are averaged over four quarters. Areas that had a labour force of less than 100 people are not included in the estimates.

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29. Department of Employment (2017b).

Colours in Figure 3.3 on page 19 indicate whether unemployment rates in the area have been pulling ahead, staying ahead, staying behind, or falling behind, relative to the national average.

- *Pulling ahead* (light yellow areas): unemployment rates were higher than the national average in 2011, and below the national average in 2016.

- *Staying ahead* (dark yellow areas): unemployment rates were below the national average in both 2011 and 2016.

- *Staying behind* (orange areas): unemployment rates were above the national average in both 2011 and 2016.

- *Falling behind* (red areas): unemployment rates were below the national average in 2011, and above the national average in 2016.

A.3   Population growth and migration

Figure 4.3 on page 22: Population distribution

SA3 areas were ranked by population density, calculated using ABS data. Cut-offs were then calculated based on cumulative population of these ranked SA3 areas.

Figures 4.1, 4.2 and 4.4 on page 20, on page 21 and on page 23: Population growth

For Figures 4.1 and 4.2, population growth was calculated using the proxy of the number of people filing a tax return in each postcode in the 2003-04 and 2014-15 financial years. As discussed in Appendix A.1, the taxation statistics released by the ATO are based on place of residence as disclosed on each tax return. Postcode data was converted to SA3 areas using the methods described in Box 2. Tax data provides a reasonable proxy for the distribution and change in population: over

13 million people filed a tax return in 2015, about 55 per cent of the population.

Population growth was mapped using data from the ABS Time Series Profiles.

Figures 4.6 to 4.9 on page 25 and on pages 27–29: Distribution of immigrants

The proportion of migrants is based on ABS Census data. Supplementary codes and "not available" observations were excluded. Where the number of individuals in a given category is small, the ABS makes random adjustments to protect people's privacy.

English-speakers and Europeans are defined as anyone born in:

- North America
- North-West Europe
- Southern and Eastern Europe
- New Zealand

People from Asia are defined as anyone born in:

- South-East Asia
- North-East Asia
- Southern and Central Asia

People from Africa are defined as anyone born in:

- North Africa
- Sub-Saharan Africa

Figure 5.1 on page 31: People with higher education

The proportion of the population aged 15 and over with higher education is based on ABS Census data. "Not available" observations have been excluded from the calculation.

People with higher education include people holding a qualification at a:

- Postgraduate Degree Level
- Graduate Diploma and Graduate Certificate Level
- Bachelor Degree Level
- Advanced Diploma and Diploma Level
- Certificate Level

Figure 5.2 on page 32: Median age of population

Data for the median age map comes from ABS Time Series Profiles (ABS (2017d)). "Not available" observations have been excluded from the calculation.
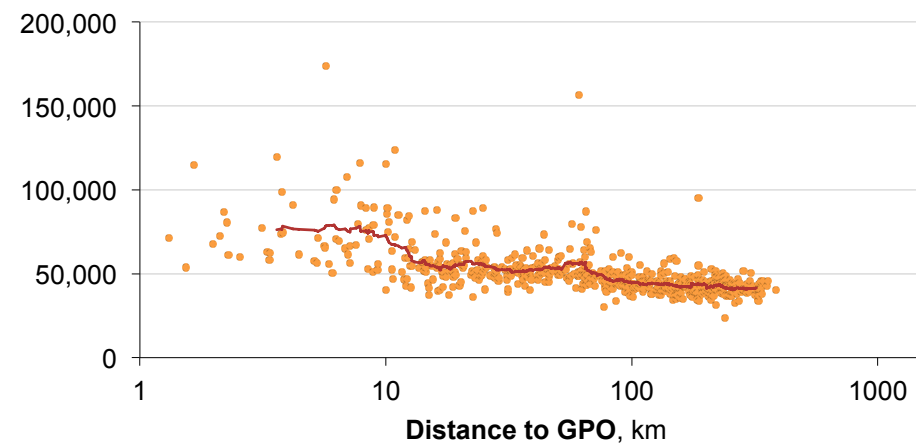
Appendix B: Income and income growth by state
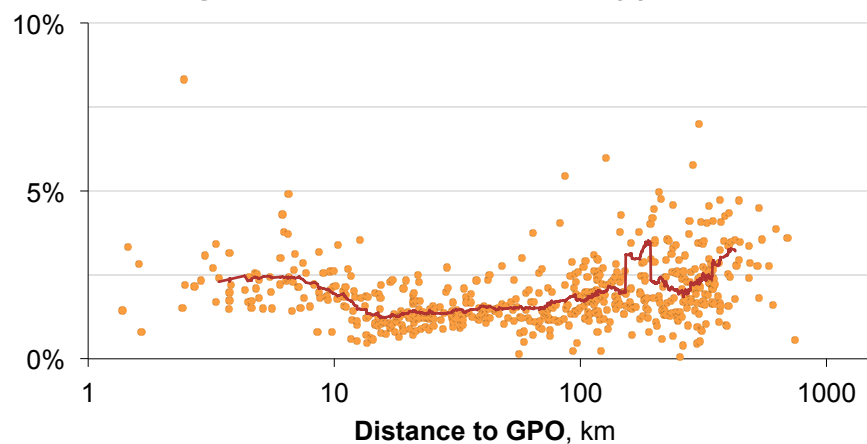
Figure B.1: Average taxable income in NSW by postcode
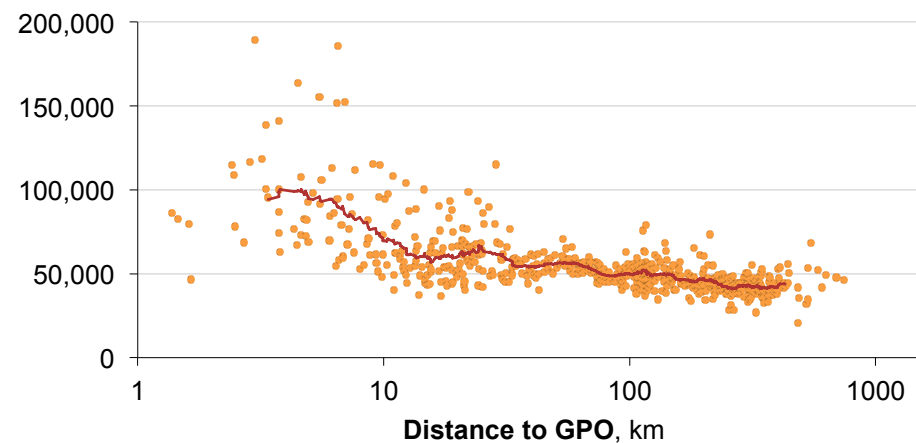
Source: ATO (2017, Table 8); Grattan analysis.

Figure B.3: Average taxable income in Victoria by postcode
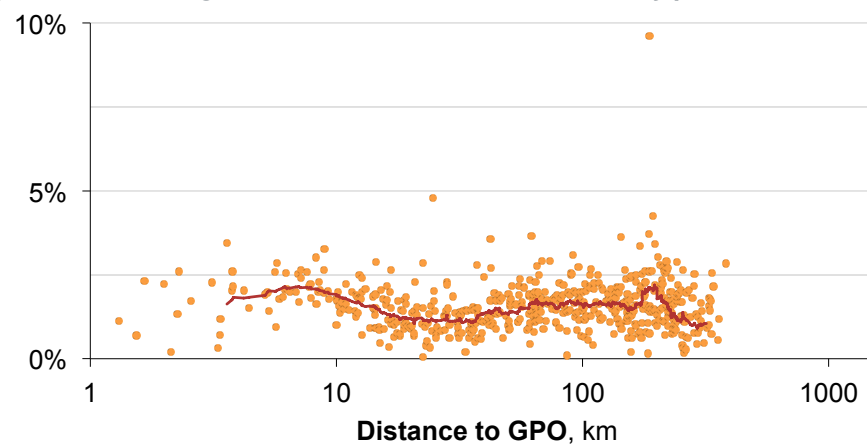

Source: ATO (ibid., Table 8); Grattan analysis.

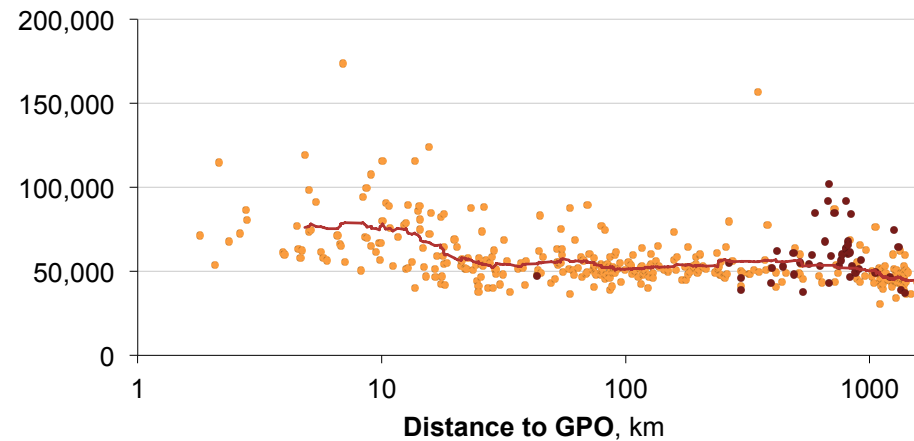**Figure B.2: Annual growth in taxable income in NSW by postcode**

Source: ATO (ibid., Table 8); Grattan analysis.

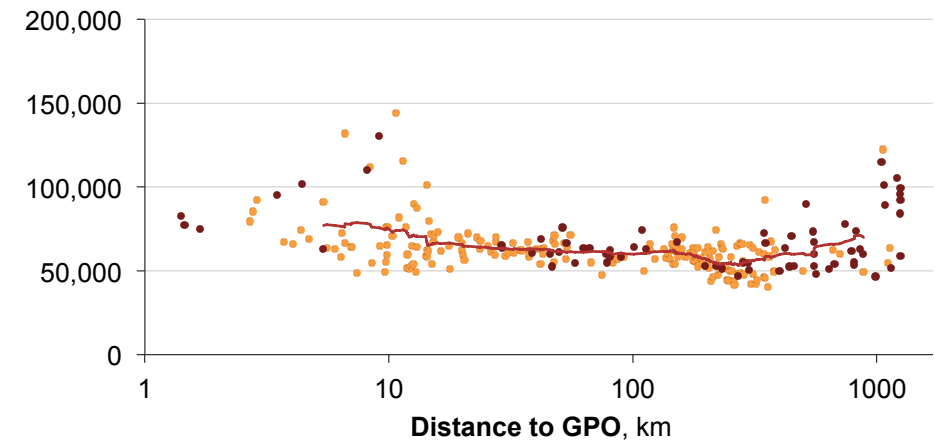**Figure B.4: Annual growth in taxable income in Victoria by postcode**

Source: ATO (ibid., Table 8); Grattan analysis.

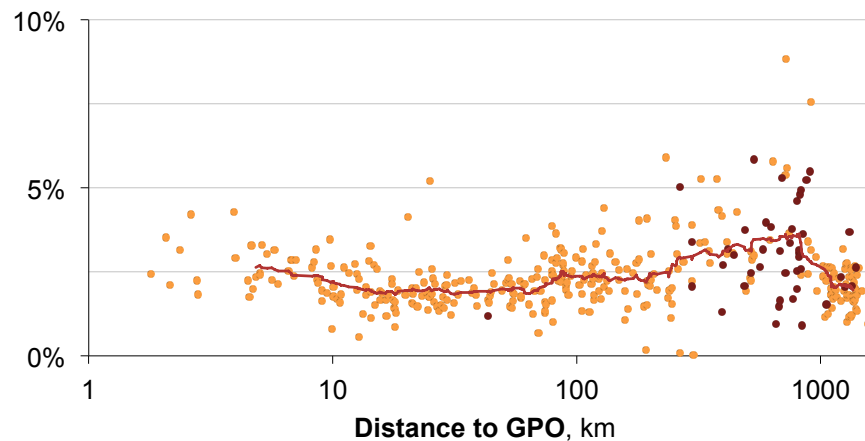**Figure B.5: Average taxable income in Queensland by postcode**

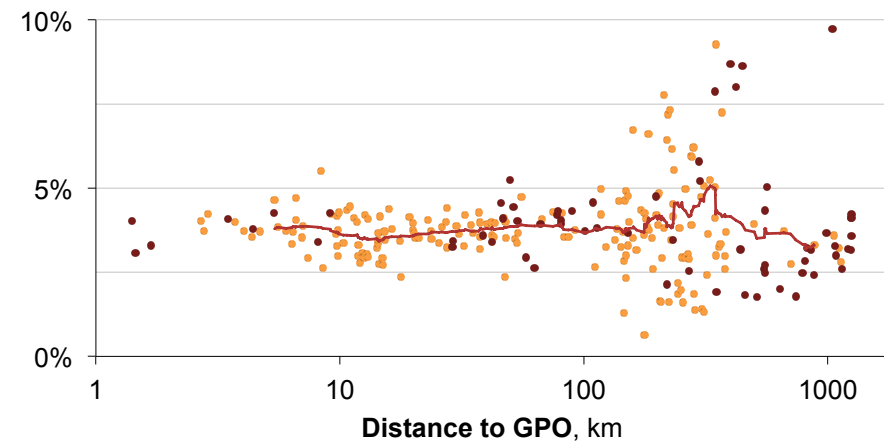Source: ATO (2017, Table 8); Grattan analysis.

Figure B.6: Annual growth in taxable income in Queensland by postcode

Notes: Mining postcodes where employment in mining is in the top decile for the State are highlighted in red. A few outliers have been excluded to aid readability.

Source: ATO (ibid., Table 8); Grattan analysis.

Figure B.7: Average taxable income in WA by postcode

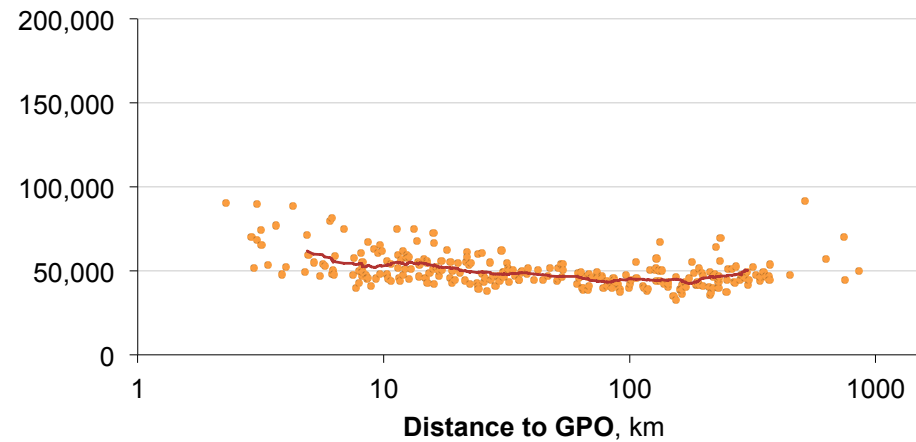Source: ATO (ibid., Table 8); Grattan analysis.

Figure B.8: Annual growth in taxable income in WA by postcode

Notes: Mining postcodes where employment in mining is in the top decile for the State are highlighted in red. A few outliers have been excluded to aid readability.
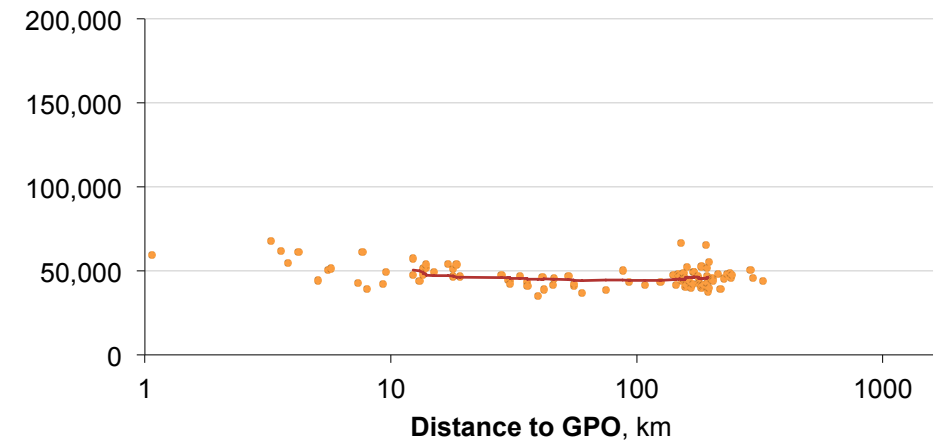
Source: ATO (ibid., Table 8); Grattan analysis.

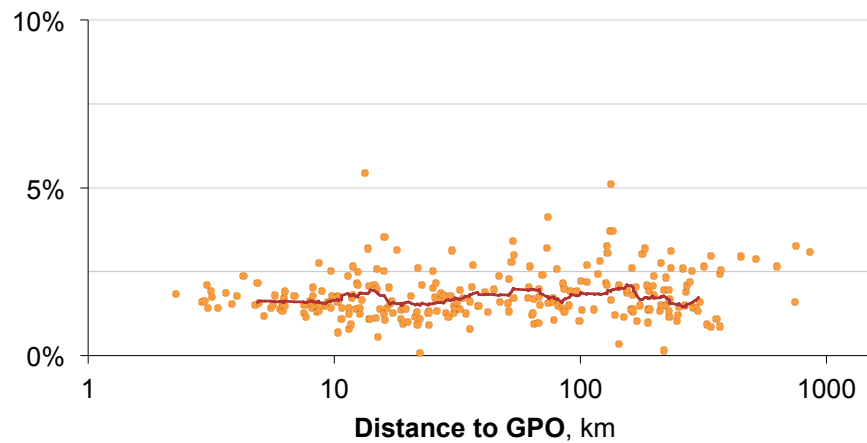**Figure B.9: Average taxable income in SA by postcode**

Source: ATO (2017, Table 8); Grattan analysis.

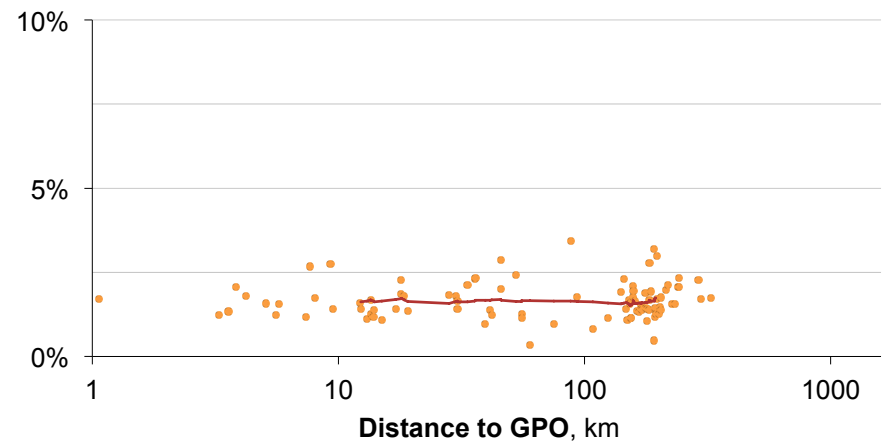**Figure B.11: Average taxable income in Tasmania by postcode**

Source: ATO (ibid., Table 8); Grattan analysis.

Figure B.10: Annual growth in taxable income in SA by postcode

Source: ATO (ibid., Table 8); Grattan analysis.

Figure B.12: Annual growth in taxable income in Tasmania by postcode

Source: ATO (ibid., Table 8); Grattan analysis.

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