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The economic dynamics and population change of Australia's regional cities

From the AHURI Inquiry: Inquiry into population growth in Australia's smaller cities

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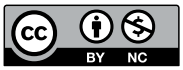

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Acronyms and abbreviations used in this report

ABS	Australian Bureau of Statistics
AHURI	Australian Housing and Urban Research Institute Limited
BITRE	Bureau of Infrastructure, Transport and Regional Economics
COAG	Council of Australian Governments
FER	functional economic region
ICT	information communications technology
JTW	journey to work
LQ	location quotient
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
SA	South Australia
SA2	Statistical Area 2
SEM	structural equation modelling
UCL	urban centre and locality
VIC	Victoria
WA	Western Australia
WWII	World War Two

Executive summary

Key points

- This analysis is based on data from the 2011 and 2016 censuses, and does not take into account the redistributions and changes that may have occurred with COVID-19. This report can be seen as providing a baseline for subsequent analysis of the changes that have occurred and continue to occur, identifying the trends and conditions across regional Australia's urban centres prior to 2020.
- Populations in regional urban centres are growing overall—however, this growth is differentiated.
- Regional urban centre population growth is associated with proximity to major cities, and to coastal locations.
- Regional urban centre population decline is associated with remoteness and exposure to the resource economy.
- Capital cities are the main source of migration to regional urban centres, principally coastal and satellite centres with regional-to-regional-centre migration highly self-contained. International migration follows similar distribution.
- Commuting between regional centres and proximate capital cities increased over 2011–2016, indicating increased peri-metropolitan dependency on metropolitan interactions.
- Employment growth is associated with population growth, particularly for the larger metropolitan satellite and coastal regional cities—however, this is also associated with lower wage growth due to the employment mix.

- **Health, community service, construction, hospitality and accommodation increased their share of regional employment.**
- **Industries associated with agglomeration economies are concentrating in fewer urban centres, while those associated with population services are becoming more dispersed.**
- **National economic growth factors appear to expert greater influence on employment growth in regional urban centres, while industry factors exert very limited influence. Regional effects exert greater influence than industry effects, although these are unevenly distributed.**
- **In 135 of 198 cases, a regional urban centre exhibits employment growth along with its surrounding functional economic region. For 33 regional urban centres there is positive divergence, while for 25 there is negative divergence. Four regional urban centres are declining within a declining functional economic region.**
- **Factors associated with stronger employment growth include employment factors, industry factors (especially those dependent on population growth), while income growth was less associated with employment growth.**
- **Population change exerted a strong influence on employment growth, as did human capital factors.**
- **Housing market (i.e. price) growth is strongly associated with population growth, while locational factors exhibited low associations.**
- **Cluster analysis identified nine distinctive regional urban centre groups: metro-satellites; large regional cities; medium growth cities; regional service centres; ageing population centres; agricultural centres; mining centres; industrial centres, and northern Queensland centres.**
- **Policy development should consider the following:**
    - Policy and planning measures to address the phenomenon of growth in metropolitan satellite regional urban centres, and the need to ensure coherent population, housing and employment distribution and linkages.
    - Coordinated economic and social development approaches to emerging low-income service economies in coastal regional urban centres.

- Long-term transition planning to address resource-dependent regional urban centres facing cyclical economic changes based on the labour intensity of construction relative to ongoing economic activity.
- Opportunities and mechanisms to leverage high-wage economic development from existing regional city industry clusters.
- Opportunities and mechanisms for regional spatial coordination of fiscal policy to optimise development of high-wage employment in suitable regional urban centres.

The study

Purpose

The contribution of regional urban centres to Australia's economic and population growth has been a topic of growing policy interest in the past two decades, as a result of rapid growth in the major cities and concerns for parts of regional Australia that have experienced population decline. Associated with these trends is the distribution of economic activity and employment—particularly as traditional regional strengths such as agriculture, manufacturing and mining have declined as sources of employment in recent decades. Over the same period, metropolitan areas have prospered because of concentrations of high-skill, high-wage knowledge work, indicating diverging regional fortunes as a result of wider economic trends.

The purpose of this research is to investigate patterns and dynamics of population, migration and economic change in Australian regional urban centres 2011–2016. The research is principally an empirically focused investigation identifying patterns and dynamic processes of regional change using advanced spatial analytical techniques, but provides an information base that will support future policy development efforts.

Inquiry

This research is part of a wider AHURI *Inquiry into population growth in Australia's smaller cities.* The Inquiry asks two overarching questions:

- First, what is the capacity of Australia's smaller cities to assist in managing national population growth, including international and national migration?
- Second, which policy instruments and programs are most likely to redirect population movements to these locations?

Study

This research investigates two overarching questions related to the Inquiry:

- How can we differentiate Australia's regional urban centres according to economic profile, population trajectory, industry structure and geography?
- What are the current mobility and settlement patterns of migrants, including those arriving from other parts of Australia and from other nations, across these smaller cities?

Three further research questions are posed by this project:

1. How can a typology of smaller cities assist to understand their role in regional, state and national economies?
2. How are Australia's regional urban centres differentiated in terms of economic profile, population trajectory and industry structure?
3. What demographic, economic and spatial factors are associated with economic and population growth, and what attributes are associated with better economic performance of regional urban centres?

Approach and methods

For Research question 1: the project undertakes longitudinal measures of social, demographic and industry change in regional cities 2011–2016 using Australian Bureau of Statistics (ABS) census data. Next, flow analysis and mapping of migration is applied to identify key migration patterns. Migration flows are used to construct migration regions via modularity analysis. Similar techniques are used to identify journey to work flows from which functional economic regions are constructed. Shift share of employment change and location quotient analysis of employment is used to understand economic change and industry structure.

For Research question 2, to understand how Australia's regional urban centres are differentiated the project applies hierarchical cluster and discriminant analysis to construct a typology of regional urban centres. This is based on a combination of economic, demographic and geographic factors. These are compiled into summary data and descriptive explanations.

For Research question 3: the study applies structural equation modelling (SEM) to identify the relationships between economic, social and demographic factors affecting population change and economic growth in regional urban centres.

Key findings

Differentiating Australia's regional urban centres

Australia's regional urban centres are heterogeneous in terms of size, location within the Australian continent and settlement structures, level of employment, industrial mix and degree of interaction with regional, metropolitan, national and international economic processes and dynamics.

In 2016, there were 198 Australian regional urban centres that had populations greater than 5,000 residents. Most are experiencing population growth. However this growth is differentiated across a range of factors, including:

- the existing size of the centre
- location relative to the coast
- location relative to an existing major capital city.

A small number of regional urban centres are experiencing population decline. These centres are largely associated with the resource economy. They are typically positioned in remote locations in Australia.

Migration

Migration is a major factor in population change within regional urban centres. Migration patterns are clearly structured at the regional scale, with distinct geographies of intra-regional movement that include discernible levels of self-containment. There is a sizeable phenomenon of major city to regional urban centre migration, especially in the south-east of Australia. Beyond the major metropolitan zones, there are larger internally connected migration regions, which often involving movement between adjacent regional urban centres. Some regional urban centres lose and receive populations across long distances. For example, the Northern Territory (NT) operates as a single migration region, partly because of its relatively small population and large scale—although the volumes of movement are relatively small.

International migration is a notable—although lesser—component of migration to and from most regional urban centres. The majority of international migrants to regional cities gravitate to the larger centres, particularly those centres that are proximate to the major cities, which reflects existing population concentrations and employment opportunities. Inland and remote regional urban centres attract relatively fewer international migrants, partly because of their less-diverse industry mix, smaller range of services, and distance from major population centres.

Differentiating regional urban centres

This research undertook a cluster analysis to differentiate Australian regional urban centres in terms of demographic, geographic and economic factors. The cluster analysis identified nine discernible clusters:

1. Metro-satellite centres—distinguished by metropolitan proximity and commuting links.
2. Large regional cities: Geelong, Wollongong, Newcastle, Sunshine Coast and Gold Coast.
3. Medium growth centres associated with lifestyle employment and retired residents.
4. Regional service centres—the largest group serving local regions.
5. Aging population centres—concentrated in northern NSW and Tasmania.
6. Agricultural centres—associated with agricultural activity, but with some resource activity.
7. Mining centres—associated with resource activity, but with some agricultural activity.
8. Industrial centres—associated with agricultural production, but often experiencing declining employment.
9. Northern Queensland centres—dependent on government employment, principally the military.

Economic performance of regional centres

This research investigated regional economic performance within a comprehensive analysis of regional growth via structural equation modelling (SEM). The model focussed on variables across four categories:

- economy and industry
- society and demography
- housing and infrastructure
- geography and transport connectivity.

The model found that employment factors were weakly correlated with employment growth, with local participation in the workforce the strongest indicator. Employment growth was associated with lifestyle and construction jobs, and self-employment. Government and resource-dependent centres experienced employment decline overall. Industry specialisation is linked to weaker economic performance, perhaps due to reduced sectoral diversity in relation to exogenous shocks. Incomes and employment growth were negatively correlated—which means that employment growth in fast-growing population centres tended to be in low-wage service sectors.

Overall, population change tended to have the strongest correlation with employment growth. However, if this population change included a strong retirement component then employment growth would be subdued. House price growth was positively associated with employment growth—although this likely reflects population effects, which means that accompanying employment growth may be low-wage. This is problematic from an affordability perspective if house prices inflate, yet wages stagnate.

Geography is a modest influence on employment growth in regional centres. Regional urban centres that are close to other centres or capitals—or near the coast—tend to have stronger employment growth than those in more remote locations.

Policy development options

The study findings offer at least three key insights for policy development:

- Regional employment growth is most strongly associated with population growth.
- Mining and agriculture are sectors of both opportunity and vulnerability for regional urban centres.
- Any policy seeking to actively distribute population more broadly across the Australian settlement system will need to consider the employment mix—particularly ongoing high-value jobs.

Regional employment growth

Regional employment growth is most strongly associated with population growth, particularly in coastal lifestyle and amenity locations. However, this employment growth tends to be in the low-wage sectors that serve these growing populations, as found by Baum, O'Connor et al. (2010).

Without higher-wage employment following population or growing from lower-wage employment, such centres face potential long-term economic weaknesses and limits to higher paid employment opportunity for their residents. This has implications for the achievement of the high-skill migrant components of *Planning for Australia's Future Population* (PM&C 2019).

For example, regional centres may miss out on attracting or generating:

- higher-waged financial services
- professional services
- information communications technology (ICT) employment
- scientific services.

These services are considered the basis for high productivity in advanced urban economies and tend to be prominent in major metropolitan agglomerations.

Devising policy strategies that can broaden and deepen economic activity in fast-growing but low-waged regional centres is important to their longer-term economic and social resilience. Such strategies could include leveraging instances where clusters of higher-skill and higher-wage employment currently exist, such as around regional university campuses or research facilities, in conjunction with the student scholarships component of *Planning for Australia's Future Population* (PM&C 2021). However, this issue requires further investigation.

Mining and agriculture: opportunity and vulnerability

Mining and agriculture remain sectors of both opportunity and vulnerability for regional urban centres. While the mining boom of the late 2000s boosted employment in some regional urban centres, much of this was cyclical employment in the mining sector—and as construction completed, population declined with employment in some centres.

Comparable patterns may be found in agriculture, where mechanisation and digitisation pose questions about future potential for employment growth and, in turn, for population growth. Similar questions may be posed in relation to infrastructure projects used as regional stimulus.

At the time of writing the Commonwealth had announced a $660m gas electricity generation plant to be built in Kurri Kurri, NSW, which it claims would create 660 jobs during construction. The Kurri Kurri plant may generate employment stimulus, but it may also cause longer-term problems because of the longevity of the effect and the extent that it exacerbates resource-sector cyclicality in Kurri Kurri and its functional economic region. Thus the use and legacy of major construction projects as regional economic stimulus deserves further research and policy consideration.

Active population distribution

A further overall observation of the project is that any policy seeking to actively distribute population more broadly across the Australian settlement system will need to consider the employment mix, particularly ongoing high-value jobs. There may be scope for strengthening spatial fiscal policy in the absence of market-led growth in higher-skill, higher-wage employment in regional centres.

Australia has not pursued spatial industry policy for some decades, although the proposed Kurri Kurri gas plant could be considered a signal of a re-emergence of such direct interventionist thinking—regardless of how questionable the project might be from either a market or environmental point of view. Spending at such scale could include mechanisms to establish sustainable higher-value employment in regional centres and attract high-skilled working populations to work in them, rather than just focussing on short-term construction jobs. But policy should consider whether there is value in moving beyond short-term construction infrastructure stimulus and towards longer-term strategic framing of regional planning and fiscal policy. This could be addressed via the Regional Deals proposed in *Planning for Australia's Future Population* (PM&C 2019).

While the research does not specifically investigate the impact of current policy debates about building fast rail links between major metropolitan areas and proximate regional cities, the research findings do have implications for such policies. For example, *Planning for Australia's Future Population* (PM&C 2019) specifically focusses on rail and road infrastructure upgrades to connect regional cities as a key measure to decentralise population.

Attempts to shift population to regional centres are potentially fraught unless they are accompanied by wider economic development interventions to ensure high-skill higher-wage activity in the destination regions. This suggests that regional fast rail schemes need to expand their scope of intent to encompass a wider frame that involves a broader and longer-term policy agenda. It also suggests that there is an avoidable naivete to policy development that is based solely on singular instruments such as a rail infrastructure upgrade without wider interventions. In this context the Regional Deals anticipated by *Planning for Australia's Future Population* (PM&C 2019) will need to give clear consideration to interventions that can generate and sustain high-wage, high-skill employment beyond simple infrastructure upgrades.

In the absence of market-led, high-wage employment growth in fast-growing regional centres, an active regional fiscal policy could be designed. This might seek to encourage higher-skill regional employment to concentrate around selected regional urban centres to stimulate critical mass and initiate or amplify higher-value-add agglomeration economies.

However, this would require coordination of public-sector activities across multiple portfolios. For example, in addition to the student scholarships for regional tertiary educational institutions anticipated by *Planning for Australia's Future Population* (PM&C 2019), national research expenditure—or at least a share of it—could be earmarked to be spent at one of the 13 Australian universities located in regional urban centres, or at one of the many regional campuses of metropolitan universities. Federal research block grant funding is worth approximately $1bn per year, and is designed in a way that favours metropolitan universities, but there is no reason this could not be specified to be spent all or in part at regional universities. Research employment is by definition high-skill. Coordination of research expenditure with spending in other policy domains, such as hospitals, energy and infrastructure might further leverage the value of both Commonwealth and state spending. There may be potential to coordinate with clean energy and climate-related financing initiatives. However, this raises questions of policy mechanisms.

National spatial planning has been discussed occasionally in policy conversations since the 1970s, and moves in 2019 to establish a national population plan have echoes of past efforts—even if they are superficial and lack fiscal weight. But if jobs are to accompany people in regional centres in the absence of market-led, high-skill employment growth, fiscal policy may need to be reconsidered as a supporting mechanism, which in turn requires a long-term coordinated plan and a degree of spatial focussing to be effective. Regional Deals as envisaged under *Planning for Australia's Future Population* (PM&C 2019) could be a mechanism for such spatial coordination.

In turn, this might require innovation in the public sector to address the evidence of employment growth predominantly in low-paid and low-productivity employment in regional urban centres. More research would be needed to investigate this dimension of policy development, which is beyond the bounds of this current study.

1. Background

This section sets out the background for this research into the population and economic dynamics of Australia's regional urban centres. The interest in regional urban centres and their capacity for growth is a response to the rapid growth of the five major cities in Australia—particularly Sydney and Melbourne.

The review of previous studies of regional Australia found the following:

- There has been a long process of population consolidation into fewer, but larger, regional urban centres.
- Regional population growth has been associated in the literature with high-amenity locations—sea changers and tree changers—as well as metropolitan proximity.
- Economically, the circumstances of many regional urban centres have been linked to industry specialisations, such as mining, agriculture and specific forms of manufacturing. While this can support growth, it can also result in vulnerability due to shifts in global markets and changing efficiencies of production and distribution.

The methods used in this report analyse data from the 2011 and 2016 censuses to further illuminate these trends, with comparisons between the regional cities and towns used to identify similarities and distinctions across regional Australia's urban centres, and to inform policy for regional growth.

1.1 Context of the research

The contribution of regional urban centres to Australia's economic and population growth has been a topic of growing policy interest in the past two decades. This attention arises as the problems of accommodating further population into the five major cities become increasingly evident—especially in Sydney and Melbourne. Policy agencies such as the Productivity Commission (2017) and Infrastructure Australia (2018) raised concerns about the capacity of the major cities to accommodate greater population while maintaining their economic productivity and liveability—particularly at pre-COVID-19 growth rates.

Policy debate has turned to the potential opportunities that Australia's regional urban centres offer for alleviating metropolitan population pressures while more evenly distributing economic activity (Correia and Denham 2016; House of Representatives Standing Committee on Infrastructure and Cities 2018). Australia has 20 cities of more than 50,000 population. Some are close to a major metropolis—such as Geelong, Wollongong and the Sunshine Coast—while others, such as Mackay and Townsville, are regional in location and function as 'capitals' for their surrounding regional population and economic catchments.

While debate has considered the potential for regional urban centres to accommodate national population growth, doubts have been raised about their economic resilience (Courvisanos et al. 2016; Productivity Commission 2017), which is an important consideration for proposed population redirection to regions. Regional urban centres are typically more directly exposed to particular economic sectors with a tendency to long-term variability, such as mining or agriculture, than metropolitan areas. The economies of these regional urban centres may not support concentrations of high-skill, high-wage knowledge work that are associated with metropolitan advantage and growth. Nonetheless, regional urban centres are variegated in economic profile and performance (Beer and Clower 2009; Smailes, Griffin et al. 2019b). Some enjoy specialised industries or services that generate economic growth (Wilson 2015). Those close to metropolitan areas may also experience tension from housing metropolitan commuters while experiencing an economy-sapping 'agglomeration shadow' (Denham 2018). Understanding the differential profiles, structures and trajectories of Australia's regional urban centres and their potential is critical to charting a larger role for them within the national spatial economy (e.g. Beer 2012).

Demographic factors are a further influence on the performance and resilience of Australia's regional urban centres. If policy effort is to be dedicated to increasing the share of national population hosted by smaller cities, an appreciation of their demographic characteristics is essential to ensure that such policy is effectively crafted. There is an assumption in much Australian policy discussion that regional areas are in demographic decline but, as with economic change, this is not a universal pattern (Smailes, Griffin et al. 2019a), and there was a widely reported increase in regional relocations during the COVID-19 pandemic. Migration—whether internal to Australia or international—is a further factor that influences and is influenced by economic and demographic change in regional urban centres, as their capacity to absorb migration flows depends both on local economic and demographic circumstances and the profile of the migrants.

1.1.1 Contribution of the research

This research extends and contributes to the literature on Australian regional population and economic change in four main ways.

The research is comprehensive in scope and extent, covering population growth, migration patterns and employment change in a single study, including detailed economic analysis.

1. The research is comprehensive in scale, encompassing all regional urban centres in Australia that are greater than 5,000 population but which are not capital cities.
2. The research focusses on regional centres within their encompassing economic region. This is an advance on previous research, which tended to focus on regions without attention to settlement structure.
3. The research uses the most currently available data—from the 2016 Census—which has not yet been subjected to detailed application for regional migration, population and economic research.
4. Together these features position the research to inform policy at national, state and regional scales, including measures informed by *Planning for Australia's Future Population* (PM&C 2019).

1.1.2 A note on COVID-19

This analysis of Australian regional urban centres was largely undertaken during 2020–2021, the main years of the COVID-19 pandemic and associated lockdowns. While there have been media reports of people leaving the metropolitan centres during this time, as well as impacts on lives and jobs, it is unclear at this point what the scope and extent of the long-term effects will be.

Also, the analysis undertaken in this research is based on data from the 2011 and 2016 censuses, and therefore cannot take into account the redistributions and changes that may have occurred with COVID-19. As a result, this report can be seen as providing a baseline for subsequent analysis of the changes that have occurred, and continue to occur, as a result of the pandemic, identifying the trends and conditions across regional Australia's urban centres prior to 2020.

1.2 Regional trajectories

Australia's regions have been the topic of multiple studies over the past three decades, at the national, state and sub-national scales and across various thematic aspects of regional change (Beer 2012; Beer and Maude 1995; Cheshire and Lawrence 2005; Collits 2004; Everingham, Cheshire et al. 2006; Gray and Lawrence 2001; Stimson 2001). A substantial effort has been dedicated to understanding the trajectories of economic and demographic change within Australia's regions. In the 1990s and 2000s, much of this effort was focussed on assessing the effects of economic restructuring on regions following the transition from Fordist to globalised economic arrangements. Such restructuring was attributed to government efforts to encourage national market competition as a microeconomic objective, and from the effects of exposure to globalised markets through reduction in tariffs and other trade-protection mechanisms.

As the direct and immediate effects of regional spatial restructuring of the 1990s and 2000s gave way to a more stable regulatory and global trading environment, researchers have begun to focus less on external drivers of spatial change and more on local factors as regions adapt to their economic circumstances. Hence, as elsewhere, there has been a substantial effort dedicated to understanding the characteristics of regions that enable them to achieve higher levels of economic performance within globalised markets that are largely deregulated (Baum, O'Connor et al. 2010; Plummer, Tonts et al. 2014).

Collits (2004) queries whether policy concerns about regional decline in Australia were merited. In part, he questions whether there was sufficient consensus in regional economic debates around the terms used to describe Australia's regions. Nonetheless he accepts that various changes had occurred, such as reduced dependence on agriculture, greater value-adding and diversity, decline in manufacturing, as well as population shifts—particularly in coastal locations.

Beer (2012) assesses Australia's regions in the context of the restructuring space economy and the transition away from agriculture as a significant export and employment sector, and the loss of manufacturing employment in both metropolitan and regional urban centres. For metropolitan cities, the impact of the decline in manufacturing has been more than offset by the rise of the service and knowledge-based sectors, which underpins the contrast between metropolitan and regional growth trajectories. Beer (2012) also recognises the contemporary boom in regional mining activity as a key factor in reshaping regions in the first decade of the 21st century. Beer (2012) also emphasises the effects of neoliberalism via shifting modes of governmental intervention into spatial economic development, accompanied by global market pressures. This neoliberal shift has, to a large extent, inhibited governments' preparedness to directly shape regional activity, in favour of indirect shaping of regional conditions through macroeconomic policy. However, this reluctance may be weakening, given recent interest in strengthening regional population growth.

The effects of national economic reform and economic specialisation on regional urban centres have been a topic of regional investigation. Beer and Clower (2009: 385) assess industry specialisation, finding accord with similar studies of what is referred to as 'industrial lock-in', that the industry of specialisation is important: '*specialisation in declining industries is likely to result in poorer growth (or further decline), while specialisation in rapidly growing industries may well produce far stronger economic development*' (2009: 385).

While at first this lock-in issue may seem obvious, the implication is that regional urban centres can grow and decline rapidly, corresponding to the needs of the industry in question. Cities such as Geelong, Wollongong and Newcastle grew as a result of industrial specialisations in the 20th century, but struggled as the Australian automotive manufacturing and steel industries went into decline after the 1970s (Rich 1987), with similar arguments made regarding the American rust-belt cities (Glaeser and Tobio 2007).

An important aspect of the lock-in literature is that the industry specialisation crowds out other sectors, which can exacerbate negative impacts when industries close, as happened with the closure of the paper mills in Burnie, Tasmania (Barton, Denham et al. 2019). More recent analysis of regional city growth in Australia found correlations between specialisation and population and labour force size, but lower wages (Beer, Akshay et al. 2020). Specialisation in manufacturing, transportation or education was also found to be associated with growth, while diversification into other unrelated sectors can act as a buffer against downturns in volatile sectors such as mining and manufacturing (Beer, Akshay et al. 2020).

The changing national economic regulatory environment enabled growth and economic deepening for some cities, as Beer and Clower (2009) argue. In particular, regional urban centres proximate to a major (capital) city, with strong service-industry sectors, experienced relatively stronger rates of growth than those dependent on manufacturing or mining. They also find that urban centres that had become more specialised also saw greater population change and labour force change than less-specialised urban centres. However, this was not necessarily correlated with higher growth.

Baum, O'Connor et al. (2010) investigate whether Australia's population-attracting 'sun-belt' regions have fared better economically than older more industrial regions, reflecting findings elsewhere that the sun-belt had outperformed comparable established regions (e.g. Glaeser and Tobio 2007). However they also note that shifts in population were accompanied by shifts in economic activity. In Australia, eight of the top 12 economic regions in terms of population growth were sun-belt regions, with only four in southern states: VIC and NSW. This coincidence of population growth and employment growth was also reflected in the obverse: population decline and economic decline. However, Baum, O'Connor et al. (2010) note that the favoured employment growth sectors in the sun-belt regions tended to be associated with population services. These growing regions were not gaining in the higher-value economic sectors associated with post-industrial producer services and manufacturing, which enjoy agglomeration effects.

The literature demonstrates that there is considerable diversity in Australian regional trajectories. Some regions are growing in population and employment as national patterns, such as sun-belt migration, drive local service demand. Others are struggling as global competitive pressures limit the scope for new economic activity.

Beer and Clower (2009) argue that the historical performance of many regional urban centres continues to exert an influence on their contemporary performance, as there is a degree of path dependency in regional trajectories. It is also of note that following the intense research interest in Australia's regional economies in 2000–2010, there have been relatively few studies since. Perhaps the most prominent debate in the 2010s was over the 'patchwork economy', as the mining boom and growth in the metropolitan service sectors resulted in differentiated concentrations of prosperity in those areas, in contrast to areas less affected by such developments (Connell and Dufty-Jones 2016; Ellem and Tonts 2018; Kelly, Donegan et al. 2014).

1.2.1 Historical population and migration dynamics in Australian regions

The population distribution patterns of Australia's regional settlements have long been of interest to researchers and policy makers, as well as to business investors. The distribution of population poses questions for those seeking to plan economic activity, such as firms considering investment in particular regional industries, or policy makers aiming to deliver services. Understanding where people currently live and their demographic profile can support future investment and service-provision decisions. In addition, differential population distributions and the movement of people between metropolitan and regional centres has at various moments raised queries about disparities in access to opportunities, including employment, health services, education and infrastructure (Hugo 2002).

Population distributions are an effect of historical patterns and economic, social and environmental change processes, often influenced by actions of governments. Researchers seek to understand these changes in order to produce knowledge about the historical development of the society. Population change happens through three principal processes: births, deaths and migration. Australia's population has grown broadly continuously since European invasion in the late 18th century, and the distribution of this population has shifted in response to various drivers.

Prior to European invasion, Indigenous populations occupied small settlements across the continent, many in locations that we would now consider as 'regional'. Following European invasion, Australian cities and regions were founded to support the establishment of a settler-colonial political economy, organised around agriculture and extractive industries. While much settlement was concentrated proximate to colonial administrative and service port towns, regional settlement patterns reflected the need for the location of population close to primary productive economic activity, such as farming or mining. Long-run change in primary production sectors has led to a reconfiguration of early post-invasion settlement patterns. Jarvie and Browett (1980) note that out-migration from peripheral regions to less remote centres has been a long-run trend in Australian spatial population change, while Langley (1977: 54) similarly observes that the tendency was for rural migrants to shift from non-metropolitan to metropolitan statistical regions.

During the post-WWII-period, there was a reorganisation of spatial population in Australia, with dispersion from the south-eastern states to the northern and western parts of the continent (Hugo 2002), which had been less intensively occupied by Europeans. The southern states of Victoria, New South Wales, Tasmania and South Australia lost national population shares during this period, while Queensland, Western Australia and (to a lesser degree) the Northern Territory gained share. This pattern, Jarvie and Browett (1980) note, was further strengthened by the tendency for post–WWII international migration to locate in the major metropolitan centres, although there were some periods when out-migration from those sites occurred—for example, Sydney experienced net out-migration in the period 1971–1976 (Jarvie and Browett 1980: 138).

Larger regional centres expanded at the expense of many smaller communities over the 20th century, particularly up until the 1970s. The greater concentration of people and employment in larger regional centres can be explained by improvements in personal transport and communications, as well as increased specialisation in goods and services. Regional urban centres have become services centres for their surrounding districts, while their employment growth has often been in population services industries such as healthcare, education and retail trade, which reflects changing consumption preferences and an ageing population (Bureau of Infrastructure and Regional Economics [BITRE] 2014; Collits 2001; Connolly and Lewis 2010).

The period from the late-1980s to the early-2000s was marked by a stabilisation of population share beyond the state and territory capitals at around 36 per cent (Gurran 2008: 392). This pattern was in part due to a distinctive process of sun-belt and sea change migration as populations have flowed to cities and regions with climatic and coastal amenity (Guhathakurta and Stimson 2007; Gurran 2008; Murphy and Zehner 1988; Stimson and Minnery 1998), accompanied by lower-cost housing than the origin location. Motivators for regional relocations included non-economic factors, with climate, lifestyle and family and friends being cited as the most important motivators.

Such patterns of amenity-driven migration complicate economic growth dynamics, as the migrants may be weakly connected to the destination labour market—or, in the case of retirees, not connected at all. This can result in local employment remaining low-skill and low-wage, such as retail or hospitality. Gurran (2008) cautions that there is potential for spatial cleavages to emerge between declining traditional regional industries in sea-change locations and the buoyant economies of major metropolitan areas. Such cleavages could lead to polarisation in the sea-change locations with the influx of metropolitan migrants, as well as the prospect of gentrification as regional housing costs rise (Costello 2007; Denham 2021). There is also 'welfare migration', where less affluent households relocate from metropolitan areas to regions because of income and cost pressures (Burnley, Marshall et al. 2007).

The role of international migration in population dynamics for Australian regions has been considered occasionally by demographers and geographers. Hugo (2008) investigates immigrant settlement outside Australia's capital cities, noting that of the 8 million post–WWII migrants to Australia, the overwhelming majority settled in metropolitan areas. However, from 1996 onwards, some categories of migrants—such as special-category visa holders—were directed by policy settings to reside in specific areas, particularly non-metropolitan locations. This led to a change in settlement patterns:

- **1991–1996:** 86.3 per cent of immigrants settled in capital cities. But from 2001–2006, this declined to 83.9 per cent—a 2.4 per cent reduction.
- **1991–1996:** 'Rest of state' destinations had a 13.7 per cent share of immigrants. But from 2001–2006, this increased to 16.1 per cent (Hugo 2008: 560).
- **1991–1996:** Sydney's share of immigrants was 37.5 percent. By 2001–2006, that share was 30.6 per cent—an 18 per cent reduction.

Hugo (2008) argues that part of this dynamic reflects changing regional fortunes, including labour shortages in some areas during 2001–2006, and some counterurbanisation trends—although these are not necessarily labour-market related. This, Hugo (2008) argues, brought new diversity to regional zones because of the mix of migrants attracted, who then brought with them new demands for services, particularly social and cultural support.

The attraction of migrants to regional locations has raised concerns about retention of such populations in those locations, given the tendency for regional labour markets to be smaller and thinner than metropolitan labour markets. Wulff and Dharmalingam (2008) investigate factors behind long-term residence by migrants in regional locations, with a focus on 'social connectedness', as reflected in participation in community life. They find that adults with children who had lived regionally for over 10 years—from English-speaking countries, as well as those in smaller towns—tended to have stronger social connectedness and greater tendency to remain living locally. Wulff and Dharmalingam (2008) note the importance of these factors within migration schemes targeting regional migrants:

- policies to engender social connectedness
- support programs for new migrants
- targeting of migrant cohorts to countries with English as a main language.

In contrast Tan, Cebulla et al. (2019: 20) report that lifestyle and employment were notable motivations for international migrants to South Australia. However, some migrants indicated that they had 'no alternative' but to move there, among other regions, because of visa sponsorship demands. Among the migrants surveyed, 37 per cent were intending to migrate—or had already migrated—out of the state (Tan, Cebulla et al. 2019: 20). This remigration was largely because of the lack of employment opportunities in South Australia, in part due to:

- lack of Australian experience
- insufficient jobs
- limited local labour-market recognition of existing skills.

This discussion highlights that population and economic dynamics are complex phenomenon in Australian regional urban centres. The long-run tendency appears to be one of general decline from traditional rural industries such as agriculture, intersected by newer trends such as sun-belt and sea-change migration to localities with amenity advantages.

These later trends complicate economic development trajectories. They imply population growth, but it is without employment growth arising from demand for local industrial output. They are also complicated by the uneven distribution of coastal amenity within Australia's settlement hierarchy. Not all regional centres are located near the coast, thus many localities are unable to switch from traditional economic sectors to amenity-based service sectors.

In addition to internal migration patterns, regional urban centres are also included in international migration flows, but the literature to date suggests that international migration to regions is not a substantial contributor to aggregate regional population growth—especially when compared to international migration to major cities.

1.2.2 Differential regional economies

The differential economic performance of cities and regions has been an abiding interest of researchers and policy makers. Since the 1980s, scholarly and policy debates have attended to questions concerning whether economic growth arises from:

- endogenous factors—factors that are internal to a region, or
- exogenous factors—the confluence of external factors.

For example, growth of the labour force and technological innovation were long considered as exogenous factors, as they typically apply broadly across regions or jurisdictions, and develop at a regular rate (Boltho and Holtham 1992). By comparison, endogenous factors—such as expenditure on education and research, levels of infrastructure investment, and governance arrangements, which are contextually specific to particular regions —began to draw attention from regional economists as possible explanatory factors behind differential regional growth trajectories (Arrow 1962).

A particular focus within the endogenous growth literature has been the factors that support or detract from the competitiveness of regions in supplying goods and services into globalised economies, referred to as either 'new economic geography' or 'new regionalism' (Taylor and Plummer 2011).

Policy makers have sought to understand these factors, often in support of local regions, and particularly those considered to be lagging in economic performance within globalised networks of trade and exchange. With national tariffs and industry protections reduced or abolished since the 1970s in support of greater flows of goods, services, finance, information (and sometimes labour) within global networks, a considerable scholarly and policy literature has emerged that offers insights for policy makers seeking to develop the competitiveness of particular places (Taylor and Plummer 2011).

Since the early 2000s, scholars of regional development in Australia have emphasised questions of endogenous growth (Plummer, Tonts et al. 2014; Stimson, Stough et al. 2011b). Stimson, Flanagan et al. (2018) investigate the economic performance of functional economic regions in Australia over 2001–2011 using an endogenous growth framework. They treat endogenous regional employment performance as the dependent variable, defined as the regional component of a shift-share analysis of employment change over the 2001–2011 period (Stimson, Flanagan et al. 2018). The independent variables were a set of 27 measures derived from ABS census data that related to factors and processes that the literature has suggested influence endogenous regional growth.

Stimson, Flanagan et al. find that over the decade 2001–2011, only 46 of 134 functional economic regions (FERs; 34 per cent) recorded a positive score on endogenous regional employment performance, and only seven had a strong positive performance (Stimson, Flanagan et al. 2018). The remaining 88 FERs recorded negative scores—and of those, four were strongly negative. Positive performance was predominantly associated with proximity to capital city metropolitan areas, whereas negative performance was associated with regional and remote locations, particularly grazing regions. Some negative performance was also present in the capital cities. Stimson, Flanagan et al. (2018) note that most regional economic policy had focussed on supporting lagging regions, rather than enhancing successful ones. They note that key factors in regional economic growth are:

- industry specialisation
- information and finance jobs
- population growth.

However, Stimson, Flanagan et al. (2018) also suggest that there are few options available to governments to boost laggard regions. They also found that human capital seemed not to be associated with positive growth, which contradicts much of the literature.

Plummer, Tonts et al. (2014) investigate endogenous growth, local competitiveness and regional development among urban centres in Western Australia (WA) in the period 2001–2011, focussing on structural economic processes. They were particularly attentive to issues of uneven economic development, which they expected would persist despite neoclassical presumptions that convergence would arise through competitive pressures in the regional space economy.

Plummer, Tonts et al. (2014) draw on census employment data to investigate the performance of regional urban centres in WA, via an ordinary least squares estimation followed by a shift share (while also acknowledging the limitations of this technique). Shift share allows for differential effects to be identified within local economies, particularly those arising from regional factors rather than national or international factors (Dunn 1960; Esteban-Marquillas 1972).

Thus, if a particular region has greater concentration of industry in a sector that is growing within the national economy, then it is likely to experience higher growth than a region that has a lesser share of that sector.

Plummer, Tonts et al. (2014) find divergence within WA's regional urban centres over the period 2001–2011, in part due to the growth in minerals and petroleum industries being unevenly distributed. One major effect was differences in population growth over the period, with WA urban centres such as Albany and Broome growing 7.6 per cent and 13 per cent respectively whereas Port Hedland and Roebourne grew by 39 per cent and 54.9 per cent respectively (Plummer, Tonts et al. 2014: 5).

This divergence was also reflected in employment growth, with the mining urban centres of Port Hedland and Roebourne each increasing jobs by 70 per cent, whereas Albany and Bunbury—which are more traditional industrial urban centres—grew by 6.7 per cent and 6.3 per cent respectively (2014: 12). Plummer, Tonts et al. (2014) note that regional urban centres in WA were marked by significant differences between places in terms of industry mix and local competitiveness. This was most marked for non-mining urban centres, which had little in common. They also note that even fast-growing urban centres like Port Hedland faced wider challenges in costs of living, housing availability and infrastructure provision. The authors conclude by arguing for regional policy to be more sensitive to conditions in regional urban centres, and for a more explicitly geographically differentiated policy application (Plummer, Tonts et al. 2014).

The question of whether regional centres proximate to major metropolitan areas experience stronger regional economic outcomes has also been investigated by researchers. Butt (2014) assesses the emergence of multi-functional counterurbanisation patterns in Australian regions and seeks to apply a typology to better understand them. He notes five main population growth processes occurring in Victoria, including:

- ex-urbanisation
- peri-urbanisation, including around regional urban centres
- coastal town and rural growth
- regional centres in strong agricultural regions
- population decline in rural areas in the more remote western and eastern extremes of the state.

From these patterns, Butt (2014) identifies five clusters of regional change:

1. Rural gentrification in amenity areas proximate to Melbourne.
2. Aging population regions, particularly in the far east and north-west of Victoria.
3. A welfare-led migration cluster in smaller deindustrialising regional towns.
4. Zones with moderate population growth but few counterurbanisation indicators.
5. Zones of manufacturing employment and metropolitan commuting in the immediate Melbourne fringe and some nearby regional urban centres such as Ballarat.

Butt (2014) emphasises the varied patterning of counterurbanisation and the generation of multi-functional landscapes. This analysis is comparable to Plummer, Tonts et al. (2014) in demonstrating the variegated population and economic dynamics of Australian regions, and the divergent trajectories that may be observed between regional urban centres and their associated rural zones.

The discussion in this section indicates that regional growth in Australia is complex and multi-dimensional. Regions and the urban centres within them are heterogeneous in terms of economic, social and geographic attributes. Differing regional economic sectoral structures, resource dependencies and locational attributes may be present between regional centres, but all combine in determining economic outcomes in variegated ways. This means that regional centres respond divergently to wider economic and demographic changes at the state, national and sometimes international scale, and also underpins the need for analysis of economic and population dynamics that takes into account these regional variations.

1.3 Regional development and population policy in Australia

The concentration of population in the major cities within Australia has been a concern since the 19th century (McManus 2005). Since World War II, the federal government has sporadically attempted to address this concentration, and promote the development of regional cities (Forster 1999). However, the primacy of the state capitals in the Australian system of settlements has continued to increase, particularly in recent decades.

From the Whitlam government's foray into regional development with the 1972 establishment of the Department of Urban and Regional Development (Reid 1976) through to the 2000s, there were limited interventions into the distribution of people and economic activity in Australia. It has been argued that this is a result of the increasing neoliberalism and market rationalism of that era (Tonts and Haslam-McKenzie 2005). While there was some policy intended to address regional development from the 2000s, there has been a continued divergence between metropolitan and regional Australia. The continued—and in recent years, rapid—growth of the state capitals, particularly Sydney, Melbourne and Brisbane (Centre for Population 2020), has led to a resurgence of interest in questions of regional development and population distribution in recent years.

A first step towards re-engaging with regional issues was the hung federal parliament after the 2010 election, which gave the three independent members of the lower house from regional seats the opportunity to negotiate with both major parties to determine which of them formed government. This resulted in the 'Commitment to Regional Australia' and resulted in new funds for regional development, policy centres and various Regional Development Australia (RDA) committees and sections within the public service (Brett 2011). The RDA fund began funding projects recommended by the RDA committees in 2011, resulting in a range of expenditures on infrastructure, community facilities and support for business and industry.

In 2015, a new ministry for Cities and the Built Environment was established by the Turnbull government. The announcement of the ministry indicated that regional cities were an important focus for the portfolio:

> We often overlook the fact that liveable cities, efficient, productive cities, the environment of cities, are economic assets. You know, making sure that Australia is a wonderful place to live in, that our cities and indeed our regional centres are wonderful places to live, is an absolutely key priority of every level of Government. (Turnbull 2015)

The swelling metropolitan regions and concerns regarding infrastructure shortfalls and housing affordability have also spurred advocacy for national policies to address population issues in Australia, including widespread support for a national settlement strategy (see Standing Committee on Infrastructure 2018). In 2019, the Australian Government published *Planning for Australia's Future Population*, which places an emphasis on providing infrastructure to meet the needs of the growing population, both to reduce congestion in the major cities and also 'to provide the infrastructure, connectivity and access to essential services to make regional Australia an attractive place to live and work' (PM&C 2019: 36). While there are other measures in the plan—rather than direct statements and targets regarding population growth and distribution—it is facilitative in its approach to population issues. Similarly the Council of Australian Governments (COAG) framed its population plan as a responsive role: '*Population change impacts most aspects of public policy. Understanding population trends and planning to accommodate these trends is therefore vital …*' (COAG 2021: 3).

It should not be surprising that politicians are unwilling to be more explicit and directive regarding population policy and planning: it has been a fraught and emotional debate for some time, with seemingly little potential for consensus (Grattan 2018; Jones 1997).

There is recent indication of a shift in regional development policy, from a focus on industry and economic development to the redistribution of population. As discussed earlier, this can be attributed to the rapid population growth creating pressures in the metropolitan areas, but it also represents the wider ideological turn to neoliberalism in Australian governments and regional policy (Tonts and Haslam-McKenzie 2005). Neoliberalism is associated with what is referred to as 'spatially-blind' or 'people-based' regional economic development—the belief that by providing people with the opportunities to develop their skills and capabilities and removing barriers to migration and mobility, people will relocate to where their opportunities are maximised. The alternative approach is to address lagging regions through place-based policy, through investments in infrastructure, industry development or special economic zones (Neumark and Simpson 2015; Pike et al. 2007, 2010).

Examples such as the Albury–Wodonga Development Corporation (Pennay 2005) and the Manson Report in Victoria (Decentralisation Advisory Committee 1967) placed economic development as the policy priority for regional development. In the case of Albury–Wodonga, the aim was to attract the private sector by the strategic relocation of government departments to the city, along with a coordinating development agency. For the Manson Report, select regional cities were provided with development agencies with land purchasing and development powers, and a role in liaising with state education and housing agencies, telephone charges in line with those in Melbourne, tertiary education facilities, and improved road and rail connections (Decentralization Advisory Committee 1967). Up until the 1980s, Australian regional cities such as Geelong, Newcastle and Wollongong had prospered through the growth of major industrial concerns (Rich 1987), with coordinated government investment in housing and infrastructure (Berry, 1984; Badcock 2000). Although these examples are limited in number, they do indicate that economic development was often central to regional policy prior to the 1980s, via investment that aimed to foster industrial growth.

The 1980s is a critical time in understanding of Australian regional economic development, as it represents a decade of significant decline in Australian manufacturing and agriculture employment due to increased global competition as a result of global supply chain management and tariff removals (Dicken 2011). Tariff reductions and the removal of barriers to trade were also central to the competition-focussed neoliberal reforms of the 1980s, which saw the rise of economic rationalism and government intervention as inefficient and hampering the function of industry (Steger and Roy 2010), which included a transition to people-focussed economic development (Varga 2017). Thus the 1980s saw contemporaneous reductions in regional employment as opportunities in key industry sectors declined, and a shift in economic policy towards facilitating migration from lagging to prospering regions. This transition has been in part responsible for the divergence observed internationally between metropolitan and regional areas due to skilled migration patterns within countries (Kemeny and Storper 2020) and flows of people more generally as the opportunity for a better life overall outweighs the higher costs of metropolitan living (Glaeser 2011).

Recent policy discourse in Australia presents a subtle distinction from the place-based and people-based policy debates, with initiatives such as high-speed rail (discussed later) encouraging *people* to relocate to *regional* centres while retaining access to *metropolitan employment* opportunity. There are three policies of particular interest in regional development. First, the Relocation Assistance To Take Up A Job program is squarely within the people-based policy paradigm, offering $3,000 for people to relocate to a capital city for work and $6,000 for a regional relocation (Department of Education, Skills and Employment 2021). Second, the current City Deal program represents a place-based intervention, with eight regional cities receiving coordinated investment programs across the three tiers of government. For example, Geelong will receive more than $350 million in investment, including a convention centre, tourism infrastructure and central city improvements (Department of Infrastructure 2018; Department of Infrastructure, Regional Development and Cities 2019). The third policy of note is the regional relocation of government research development corporations to regional centres (EY 2016), recalling the earlier example of Albury–Wodonga. However, this has come in for criticism due to the flexible definition of 'regional', as Deputy Prime Minister Barnaby Joyce observes:

> Decentralisation has to be authentic decentralisation. That is not Sydney to Parramatta. From the top of a tall building in Sydney, I can see Parramatta. So you can't say that is decentralisation … Decentralisation from Canberra to Adelaide is yet another one. (Cited in Dingwell 2018)

A further prominent proposal for population redistribution policy in Australia has been regional faster rail and high-speed rail, as outlined by the then Deputy Prime Minister and the Minister for Infrastructure and Transport Michael McCormack:

> … we need to make sure that congestion in our cities is eased. We also need to make it easier for people in regional areas to commute to cities such as Brisbane, such as Sydney, such as Melbourne, so that they can enjoy the lifestyles of living in the wonderful electorates such as the one we are in here right now, and also enjoy city wages, city living, but to be able to get home in good time so they can enjoy time with their families. (McCormack 2018)

However, the efficacy of high-speed rail has been questioned both in Australia (Denham 2018; Denham and Dodson 2019) and internationally (Tomaney 2013), and it is yet to be seen whether any of the proposed fast rail projects proceed.

One important insight from these critiques of high-speed rail is that the redistribution of people is not the equivalent of the redistribution of employment: it is likely that infrastructure that facilitates the outward movement of residences also facilitates the inwards movement of higher-order economic activity and thus good jobs. Unless regional rail programs also include a regional employment program, they risk producing regional suburban dormitories enjoying heavily subsidised rail access to metropolitan jobs.

High-speed rail also indicates a distinction between regional policy that addresses regional issues—such as employment, opportunity and, in some regions, population decline—and those that address the metropolitan problems associated with rapid population growth. The recent debates regarding Australia's population growth and distribution have considered the overcrowding of the metropolis as the primary problem for policy to address, as the earlier quote about the faster rail program from then Deputy Prime Minister McCormack indicates.

The policies and theoretical debates discussed in this section suggest the need for a more detailed understanding of the population dynamics and related issues across the range of communities in regional Australia. This would enable the formation of policies that promote shifting to regional areas where population is a concern, rather than a perception of regional Australia as an outlet for metropolitan growth.

Further policy consideration of regional population and economic development questions emerged in early 2019 with the release of *Planning for Australia's Future Population* (PM&C 2019), which sought to establish a shared approach to managing population challenges with state, territory and local governments. The plan has five main elements:

1. Managing urban growth by reducing migration rates and investing in infrastructure and services—including via City Deals.
2. Investing in regions through a decentralisation agenda, including 'Regional Deals'; upgrading road and rail infrastructure; creating nearly 5000 university scholarships targeted at regional university or vocational training institutions.
3. Refining migration intake to skilled migrants.
4. Strengthening the integration of new migrants through community support services.
5. Delivering a national population and planning framework, as well as establishing a population research and policy centre to better understand the population dynamics of states, cities and regions.

The present research is relevant to the national population planning in two key ways:

- It aligns with the decentralisation intent of the national population plan by informing understanding of the implications of population decentralisation.
- It offers insights into economic dynamics and the current factors that affect the economic performance of regional urban centres. These insights can inform the implementation of the plan by highlighting the complexity of relationships between population and economic performance at the regional centre scale.

The remainder of this section details the research investigation undertaken of regional population and employment dynamics.

1.4 Research questions, approach and methods

This project investigates the changing economic profile and performance of Australia's regional urban centres and assesses how demographic and migration patterns are shaping and responding to economic change.

The project responds to two Inquiry level questions:

- How can we differentiate Australia's regional urban centres according to economic profile, population trajectory, industry structure and geography?
- What are the current mobility and settlement patterns of migrants, including those arriving from other parts of Australia and from other nations, across these smaller cities?

Three further research questions are posed by this project:

1. How can a typology of smaller cities assist to understand their role in regional, state and national economies?
2. How are Australia's regional urban centres differentiated in terms of economic profile, population trajectory and industry structure?
3. What demographic, economic and spatial factors are associated with economic and population growth, and what attributes are associated with better economic performance of regional urban centres?

1.4.1 Research approach

This project investigates the dynamics of economic and population change and migration in Australia's regional urban centres. To do this, the project applies the methodological framework of functional economic regions (FERs) as the basis for analysis. FERs have been used internationally and in Australia (Mitchell and Watts 2010; Stimson, Flanagan et al. 2018) to depict spatial economic activity and relationships at the regional scale. A second analytical method applied is structural equation modelling (SEM) to ascertain important factors in regional growth

Functional economic regions

FERs are useful analytical constructs, as they represent a 'revealed' geography generated from real data on spatial economic relationships. As they are generally defined by analysis of commuting flows, FERs mitigate problems of spatial autocorrelation that can occur with the use of artificial *de jure* administrative boundaries as economic units.

In other words, the impact of the often arbitrary choice of boundaries on the analysis is minimised by constructing geographies that reflect shared circumstances and labour markets with high degrees of containment. Thus FERs can be used as geographical units of analysis to further investigate subregional economic dynamics, including those of smaller cities. The delineation of FERs depends in part on data that can reveal commuting relationships between residential and employment locations.

This research develops new methods to analyse FERs in Australia, going beyond previous efforts using older data (Mitchell and Watts 2010; Stimson, Flanagan et al. 2018). The approach in this project identifies FER geographies for regional urban centres, and uses these units as the scale for appraising economic patterns, demographic change and migration flows. The benefit of using modularity analysis for constructing FER geographies—as this research does—is that the outcome of the method is clusters that minimise the flows across the boundaries.

For FERs, the analytical focus is on constructing spatial units with minimal interactions with their neighbours. The use of modularity analysis enables the construction of an FER geography that may combine more than one regional urban centre, whereas previous methods start by selecting regional urban centres as nodes for analysis. This means the method can take into the account regional interactions, particularly those that cross state boundaries, reflecting the interaction between border communities such as Albury and Wodonga, and Tweed Heads and Coolangatta. Also, as indicated by the research, FERs change in response to regional population, employment and commuting dynamics, indicating the need to update them.

Spatial economic models of regional growth

In the regional economic literature, spatial econometric models have been used to analyse spatial effects in regional relationships. For example, Stimson, Flanagan et al. (2018) use spatial auto-regressive model and spatial error methods to model the endogenous regional performance in Australia. However, several issues remain unsolved in these forms of econometric analysis used to gain a comprehensive understanding of regional dynamics:

- The causality relationships between the regional growth and explanatory factors are difficult to capture using the conventional models.
- The factors driving regional growth are likely to be highly correlated rather than independent, which reduced the explanatory power of standard regression methods. Also, if the influential factors are correlated, their effect on the dependent variable becomes more complex to assess—for example, regional employment growth and population growth.

To date, there have been relatively few attempts to develop operation models explicitly to explore the inter-dependency between explanatory factors and causality relationships in the process of regional economic growth. For this reason, we adopt an alternative method to analyse regional employment growth: structural equation modelling (SEM). The advantage of SEM is that it estimates the relationships between variables using flexible path analysis, and its unique model construction avoids the statistical issues and analytical limitations of linear models. SEM has been widely adopted in behavioural science, but is rarely applied in regional analysis (Aroca, Stimson et al. 2014). Therefore, SEM can produce more robust results and findings that aid understanding of regional growth. In this study the SEM is constructed and tested using statistical software PLS-SEM (partial least squares–structural equation model).

1.4.2 Research methods and tasks

Summary of key project tasks

Key project elements in the research approach include the following.

1. Literature review and background study of regional urban centres in Australia to identity the study scope, based on population size, economic function and location.
2. Identifying FERs for each regional urban centre for the 2006, 2011 and 2016 census periods, and building a specialised longitudinal dataset for each FER.
3. Measuring the social, economic, spatial and transport characteristics of each regional urban centre and FER, as well as their changes between 2011 and 2016.
4. Undertaking econometric analysis of endogenous economic growth across Australia's regional urban centres to reveal relationships between the economy, demographic change and the effects of migration.
5. Analysing the residential mobility profile of each regional urban centre to identify the types of regional urban centres that experienced high or low levels of migration gain or migration loss.

Detailed task descriptions

Key analytical tasks involve the following.

- **Task 1:** Selection of regional urban centres based on population and location

  This task applies two factors to select regional cities for detailed analysis in this project:

  - population size
  - remoteness.

  We use a population threshold of 5,000, which indicates the minimum size of the regional urban centre for analysis within Australia's settlement hierarchy. Remoteness is also used, based on the expectation that the economic and social role of regional urban centres is associated with proximity to other centres. For example, smaller regional cities that are remote may play a disproportionate economic role relative to their region than larger regional cities proximate to a major city. Further validation of the urban centres selected or inclusion of additional cities is based on the outcomes from the analysis in the later tasks.

- **Task 2:** Analysing the population change in second-tier regional urban centres between 2011 and 2016; identify the types of cities that experienced high or low levels of migration gain or loss

  This task analyses the social and demographic dynamics of the selected cities. It provides new data and measurements that enhance the understanding of the demographic characteristics and change of the selected regional cities. This task also analyses the residential mobility of regional centre populations through advanced spatial analyses of migration flows broken down by population groups, including Indigenous Australians. In this project, the spatial datasets used to analyse the demographic and migration characteristics of the selected regional cities were gained from ABS 2011 and 2016 data at Statistical Area Level (SA2) level by place of usual residence. The SA2s geographically intersect with the urban centre and locality (UCL) boundary of a regional urban centre. The purpose of using SA2s for demographic and migration analysis is that they capture the regional settlement centre, and provide a consistent set of spatial units for migration origin and destination where the demographic and migration flow data is available. Note that this method only captures migration flows based on place of residence at the time of the 2016 Census compared to the 2011 Census. It does not reflect intermediary residential movements between those two census dates.

- **Task 3:** Analysing the economic characteristics of regional cities and their changes between 2011 and 2016

  This task analyses the industry and labour-market characteristics of the selected regional urban centres and their variations. It provides new data and measurements that can enhance the understanding of the economic diversity and growth of the selected regional urban centres. The spatial datasets used to analyse the economic characteristics and change of the selected regional cities were gained from ABS 2011 and 2016 data at SA2 level by place of work (where the detailed employment data are available). Another advantage of using SA2 to represent the industry and employment data is that it captures the employment in some industries—such as farming and agriculture—that are beyond the geographical boundary of the UCL in some remote areas. Also, the research identifies and constructs a FER, so that every regional city is linked with a FER, which allows analysis of the effect of regional economic performance on the UCL economy.
- **Task 4:** Investigate the demographic and economic profile and performance of second-tier cities

  This task profiles the selected regional urban centres in Australia by analysing and classifying their broad characteristics, such as:

  - demography
  - wealth
  - employment and industry growth
  - location
  - housing characteristics.

  A hierarchical cluster analysis is then conducted to identify the similarities and differences between the regional cities in various characteristics. This provides an improved understanding of the general profile of each regional urban centre, and the degree to which there is variation across Australia. The cluster analysis allows the construction of a broad typology of regional centres by economic structure and function.
- **Task 5:** Analysing the economic growth across second-tier cities to reveal relationships between the economy, demographic change and the effects of migration

  The research conducts a SEM to analyse the spatial, economic and demographic factors that are associated with economic change in the selected regional urban centres. We identify a range of explanatory variables —selected from data assembled in Task 2 and Task 3—that may influence local population and employment growth (Table 1). The analysis arising from the task provides robust insight into the network of relationships between the factors that can explain the variations in economic performance of regional urban centres.

Table 1: Research questions, data sources and methodology

Research question	Data sources	Methodology and techniques
How can a typology of smaller cities assist to understand their role in regional, state and national economies?	• ABS census data by place of residence (2011; 2016) • ABS census variables by place of work (2011; 2016) • Internal migration data (SA2, 2011–2016), • Journey-to-work (SA2, 2011 and 2016)	• Longitudinal measures of social demographic and industry changes in regional urban centres • Flow analysis/mapping of migration • Modularity analysis of migration and journey to work (JTW) flows • Construction of migration regions and FER • Shift-share analysis of employment change • Location quotient analysis of employment
How are Australia's second-tier cities differentiated in terms of economic profile, population trajectory and industry structure?	• Variables and data outputs for regional urban centres produced from Research question 1	• Hierarchical cluster and discriminant analysis • Compile regional urban centre profiles
What demographic, economic and spatial factors are associated with economic and population growth, and what attributes are associated with better economic performance of second-tier cities?	• Variables and data outputs for regional urban centres produced from Research question 1 and Research question 2	• Structural equation modelling

Source: Authors.

2. Population change and migration

This section investigates population growth and migration flows in regional Australia.

The analysis identifies three significant trends:

- **Larger and metropolitan-proximate regional urban centres are generally increasing in population more rapidly than other regional urban centres.**
- **Also, coastal urban centres have experienced faster population growth rates than inland urban centres.**
- **Population losses tend to be concentrated in inland, smaller, remote and often resource-reliant towns.**

Together, these trends indicate that population growth in regional Australia is concentrated in the commutersheds of the state capitals, particularly Sydney, Melbourne and Brisbane. This concentration occurs as a result of two processes:

- **out-migration of metropolitan residents in the peri-urban urban centres and towns**
- **inwards flow of more remote residents.**

2.1 Regional population growth and distribution

Population growth and distribution has been a widely discussed topic over the past decade—particularly the rate of international migration and the rapid growth of Australia's larger cities. The metropolitan growth pressures include:

- infrastructure shortfalls
- concerns around housing affordability
- increasing congestion (Denham, Dodson et al. 2018; Saberi, Wu et al. 2017).

These pressures have resulted in increased interest in regional relocations, both from government—through projects such as high-speed rail (McCormack 2018)—and metropolitan residents. An increase in regional relocations by metropolitan residents was a recurring theme during the 2020–2021 COVID-19 pandemic and associated lockdowns (e.g. Collett 2020). However, this framing of population issues in Australia takes a metropolitan perspective, which masks the various trends and processes of population change across regional Australia (Smailes, Griffin et al. 2019b), which are explored in this chapter.

There are two ways that populations change:

- naturally, through births and deaths
- through inward and outward migration.

Natural change has an impact on some regions of Australia, particular where the population is ageing, but outside of the 'baby bonus' there are few policy levers available to government that can alter trends in births and deaths—at least in the short-term. Therefore, the focus of this research is on the redistribution of population through migration—particularly the drivers of relocation from metropolitan areas—as there is a greater capacity for government to influence this aspect of regional population growth and, importantly, the geographic distribution of population. Australia also has a high rate of housing mobility compared to other OECD countries (Bernard, Forder et al. 2017; Sánchez and Andrews 2011).

2.1.1 Mobility and migration

Migration implies more substantial changes to lives than merely the change of residence, indicating a change in the geography of household social and economic spheres as well as housing (Mulder and Hooimeeijer 2012: 179). While the distance of relocation does not provide a distinction between mobility and migration—and they can be considered as a spectrum—a common policy distinction is that:

- mobility is a change of residence
- migration includes a border crossing, and includes work as well as residence (EurWork 2012; IOM 2022).

Migration can be further categorised into:

- internal—migration within a country
- international—migration that crosses international borders.

In the typology of counterurbanisation set out in the formative work of Champion (1989), similar distinctions were made between 'clean breakers' and 'spillover counterurbanisation':

- clean-breaker migrants relocate their livelihoods and social functions to new regional locations
- spillovers move to a regional residence but retain strong metropolitan work and social connections.

In the analysis of residential mobility in regional Australia, it is not apparent from census data whether mobility entails migration, particularly in the more remote regions where social networks and employment patterns can be sustained over large geographic expanses. While this implies a need to consider social and lifestyle alongside residential address changes, in considering the spectrum from mobility to migration, the change of residence across Australian Statistical Geography Standards (ASGSs) is used as a measure of migration in this report.

2.1.2 Factors in regional migration

Decisions to migrate, including changing social and employment factors as well as place of residence, can be the result of a range of factors, including:

- social context and economic opportunities
- stage of life factors—e.g. transition between education and employment; family formation; retirement
- housing markets (Mulder and Hooimeejier 2012; Sander and Bell 2016).

The interplay between these factors offers insights into trends in regional migration.

Survey data from 2020 (Rolfe, Kinnear et al.) reveals the differences in factors between rural and metropolitan migration preferences in Australia:

- More than 60 per cent of regional residents see living in regional Australia as very desirable, compared to less than 10 per cent of metropolitan residents. Almost 60 per cent of metropolitan residents reported that living in regional Australia was either 'a little desirable' or 'not at all desirable'.
- Reasons for relocation decisions were markedly different:
    - Regional relocation reasons were predominantly for family and friends, natural environment, and to upscale or downsize a residence.
    - Metropolitan relocations were stated as being for 'family and friends', but were more likely for career reasons, employment and education than regional relocations (Rolfe et al. 2020).

Similar results were reported from a survey of regional relocations of metropolitan workers, which highlights the importance of familial and friendship connections and amenity in such migration patterns (Denham 2021). Both of these studies indicate that housing affordability is not as great a factor in regional relocation as the type of housing on offer within housing budgets. As Rolfe, Kinnear et al. conclude, the metropolitan areas:

> appear to have a strong 'pull' factor that regional areas do not enjoy to the same extent, and there is some evidence that people in regions do not have the same drive for career progression that their urban counterparts do. These will be some of the factors that underpin the current challenges that regions in Australia have to attract and retain workforce. (2020: 13)

There is a substantial literature on the correlations and causations between employment and population growth (e.g. Greenwood and Hunt 1989; Partridge and Rickman 1999). The formative study by Muth (1971) described the relationship as a 'chicken and egg' situation, as employment will attract population, which then attracts further employment. Trendle (2009) analyses the relationship between employment growth and migration in Queensland, and concurs with the earlier studies that the causality was bidirectional; however, there was evidence that people following jobs was a stronger driver of growth. There is an implication within Trendle's study that the quality of employment is an important factor in migration.

Trendle is cautious about the impact of such employment growth, as the benefits of regional job creation can be dissipated by in-migration. Indeed, Beer, Akshay et al. (2011) found that employment spikes in regional areas led to rapid population growth as well as inflated housing markets.

Also, metropolitan-proximate relocations—in the context of increases in regional residents commuting to metropolitan employment (Denham 2018)—could be analysed as a process of metropolitan expansion rather than regional development (Mitchell and Stimson 2010; Taylor and Paine 2007). As Butt (2011: 61) observes: 'the growing connectedness to the social and economic conditions of large cities, is the critical indicator of Australia's patterns of [regional] population growth'.

As discussed later in Section 2.5, amenity migration has also been a prominent trend in Australia over recent decades. This applies particularly to the sea-change and tree-change destinations in eastern Australia (Gurran 2008), with people moving to coastal and high-amenity, often wooded, rural areas. Pre-existing social connections —friends and family—were also identified as a driver of regional migration. This appeal of rural living can be seen to some extent as a reaction to the perceived diseconomies of scale associated with city growth: congestion, pollution and increasing living costs (Dicken and Lloyd 1990).

Population dynamics in regional Australia as a result of migration are likely to be the result of the mixed effects of multiple social and economic processes. These include changing preferences that respond to amenity and the imposts of metropolitan living, labour markets and personal connections. The distinction between mobility and migration may also imply the degree and type of change occurring within Australian regions—and migration implies a higher degree of embeddedness and benefit for regional communities.

2.2 Population distribution and change

Better knowledge of population change and migration patterns is essential to support better policy for Australia's regional urban centres. If policy effort is to be dedicated to increasing the share of national population hosted by regional urban centres, then an appreciation of their characteristics is essential to ensure that such policy is effectively crafted.

This section analyses the distribution of population and changes in this distribution across regional urban centres in Australia between 2011 and 2016, via quantitative analysis. We first analyse the major population change in regional urban centres via descriptive analysis, including spatial mapping of population distribution and scale and rate of change.

As the focus of this research is regional settlements, the ABS urban centre and locality (UCL) geography is used as the analytical unit. This geography is useful for regional analysis, as it differentiates urban localities from rural hinterlands on the basis of contiguous urban development, rather than following administrative boundaries. Thus metropolitan satellites such as Melton in Victoria are represented in the data as separate urban centres relative to the nearby major metropolis. As the first analytical section of the report, it provides an overview of population size, growth, rate of change and location in non-metropolitan Australia.

Because of their smaller population base, we focus on migration as a factor that influences economic and demographic change in regional urban centres, whether via intra-regional migration or international movement. The capacity of smaller regional urban centres to absorb migration movements depends on:

- the local economic and demographic circumstances
- the demographic and labour-market profile of the migrants.

2.2.1 Population size

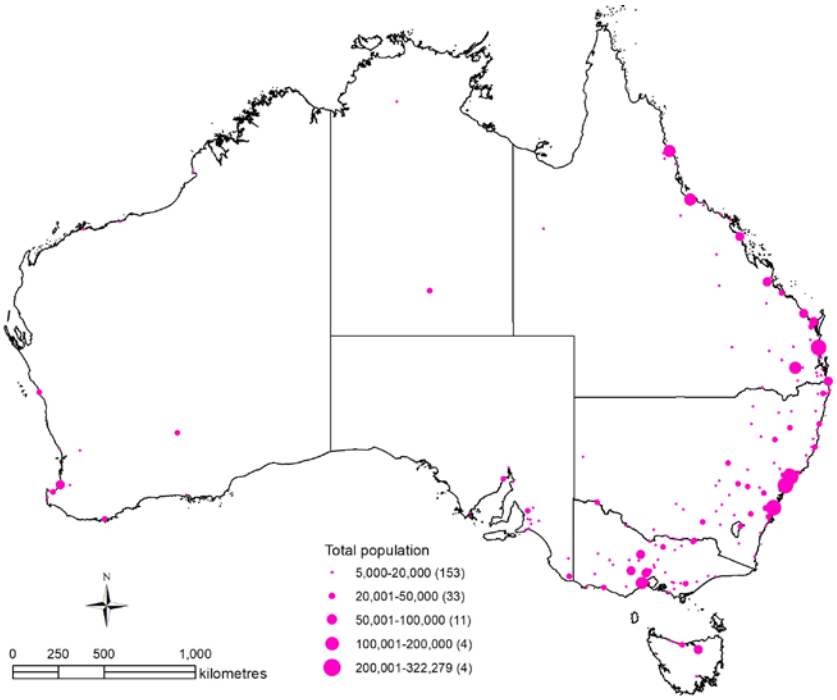
In 2016, the 198 regional urban centres in Australia—measured via the ABS UCL geography—with population greater than 5,000 were home to 4,978,341 residents. This represents 21.3 per cent of the national population. This pattern is heavily weighted towards the east of the Australian continent, with most regional urban centres above 5,000 residents located in a broad 500-kilometre-wide coastal band from Mt Dampier in South Australia to Cairns in north-east Queensland, as shown in Figure 1. This distribution is quite even, although with a discernible sparseness along the coastline between the Latrobe Valley in Victoria and Wollongong in New South Wales.

There are only a few regional urban centres of more than 5,000 residents beyond this zone:

- near Adelaide
- south of Perth
- in northern Tasmania
- in very isolated internal locations.

There is greater diversity in settlement hierarchy in Victoria and New South Wales than in other states. Queensland has the highest number of larger regional urban centres, which reflects the decentralised distribution of population in that state.

Figure 1: Regional urban centres with >5,000 population, Australia, 2016



Source: ABS census data, authors' calculations.

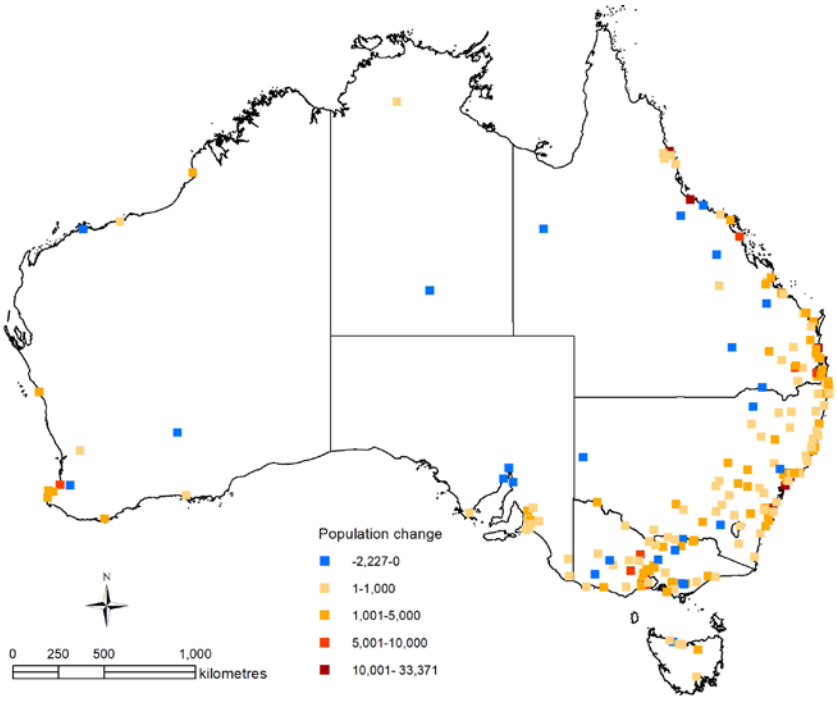
2.2.2 Changes in population distribution

Patterns of population change diverge across Australia's regional settlement structure. Most regional urban centres grew in population between 2011 and 2016, though a noticeable minority lost residents (Figure 2). Population growth by count is concentrated within a set of urban centres proximate to the major state capitals, particularly Melbourne, Sydney and Brisbane and, to some extent, Adelaide and Perth. Moderately growing urban centres by count are distributed principally along the south-eastern Melbourne–Brisbane zone (Figure 3). By contrast, urban centres that are losing population are more likely to be remote from a capital city, such as Mt Isa (QLD), Alice Springs (NT) or Kalgoorlie (WA).

Most regional urban centres experienced population growth, measured as absolute change by population count. The regional urban centres with the strongest population growth during 2011–2016 were principally located within 250 kilometres of a major city, such as Bendigo and Ballarat in Victoria; Wollongong in New South Wales; and the Sunshine Coast in Queensland; and those spread unevenly along the long coastline from Adelaide to Cairns. Only two coastal towns lost population during this period: Karratha (WA) and Ayr (QLD).

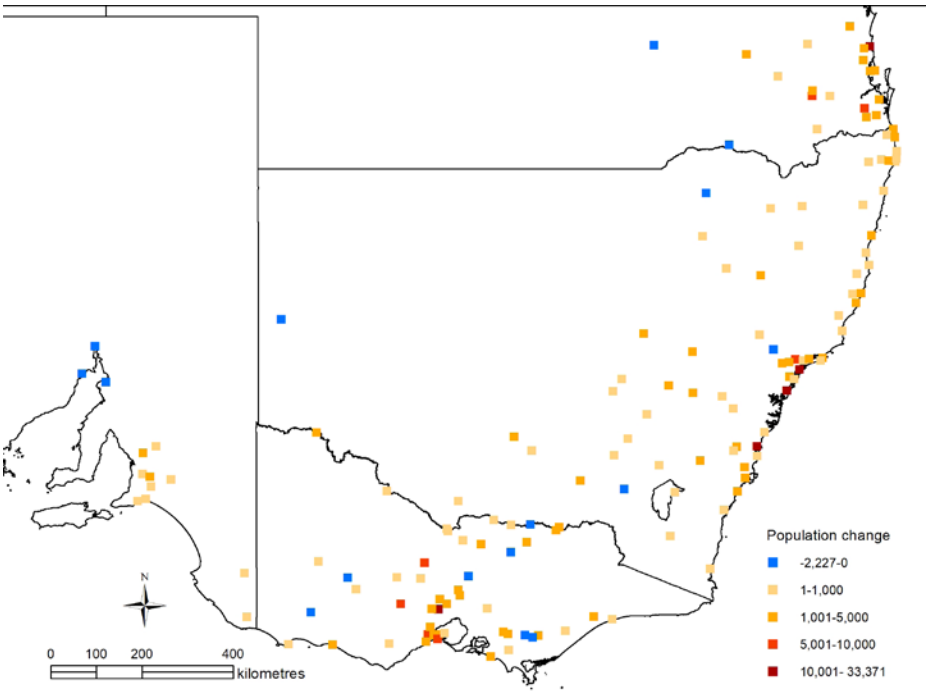
Other regional cities and towns that lost population during the 2011–2016 period were inland or remote, such as the northern Spencer Gulf port towns of Port Pirie, Whyalla and Port Augusta (SA); western and northern Victorian towns such as Hamilton or Stawell; border towns in NSW, such as Goondiwindi; or regional towns in Queensland such as Roma or Mt Isa (see Table A1 in Appendix 3). Some regional towns near major cities, such as Morwell in Victoria or Singleton in NSW, lost population while immediately adjacent towns experienced population growth.

Figure 2: Total population change in regional cities, Australia, 2011–2016



Source: ABS census data, authors' calculations.

Figure 3: Total population change in regional cities, south-east Australia, 2011–2016



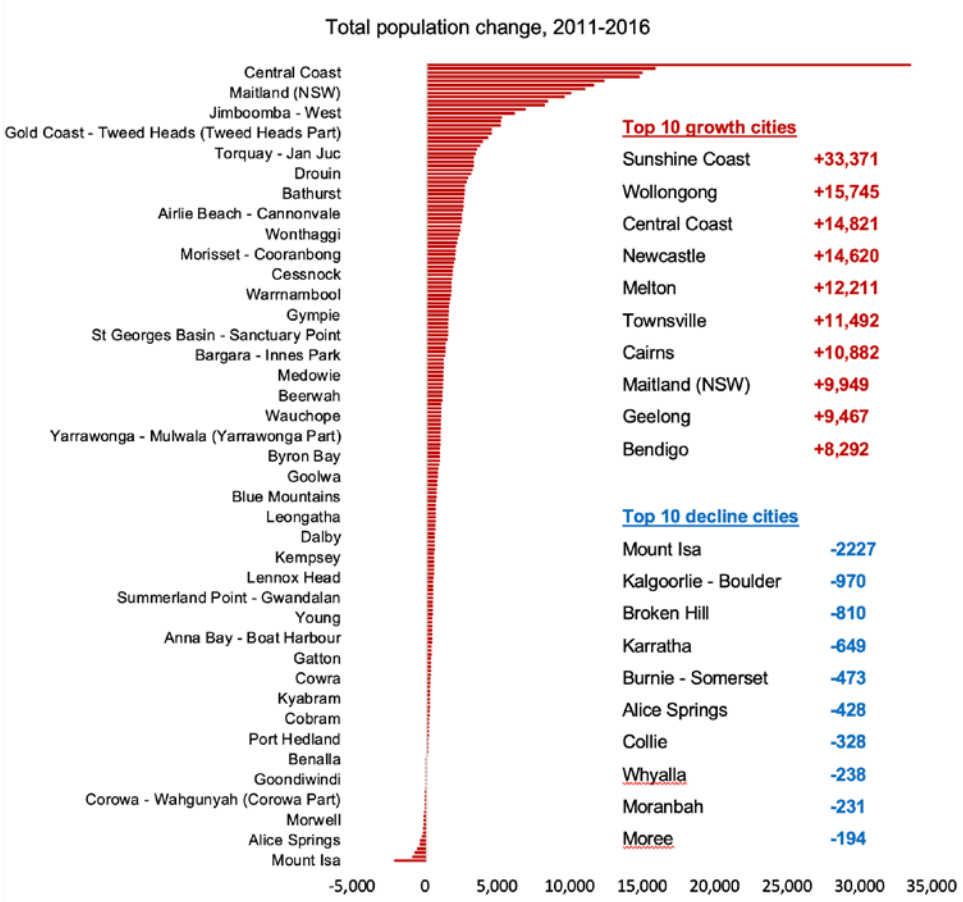
Source: ABS census data, authors' calculations.

2.2.3 Growth and decline

When considered in terms of net population change by count during 2011–2016, there is a wide distribution across Australia's regional towns and cities. Some regional cities experienced very large population growth. The top seven largest-growing regional cities of Sunshine Coast, Wollongong, Central Coast, Newcastle, Melton, Townsville and Cairns all witnessed population gains of at least 10,000 residents (Figure 4). The remaining three in the top 10—Maitland, Geelong and Bendigo—all gained at least 8,000 residents during 2011–2016. Each of these regional centres is relatively large, and all are within 200 kilometres of a major city apart from Cairns and Townsville.

Major net losses of population were concentrated among remote, typically resource-based towns and cities during 2011–2016. The remote Queensland city of Mt Isa was heavily affected, losing 2,227 population during the study period. Kalgoorlie–Boulder, Broken Hill and Karratha also experienced population losses of more than 650 residents during 2011–2016. Other resource towns experiencing high losses of population in 2011–2016 include Whyalla (SA) and Moranbah (NSW). Among the top-10 towns for population loss during the study period, Collie (WA), Burnie (TAS) and Alice Springs (NT) might be considered as principally rural or remote, rather than resource-dependent. These data indicate that fluctuations in the resource economy potentially exert large influences on the population fortunes of resource-dependent towns, reflecting the literature on industrial lock-in and specialisation.

Figure 4: Net population change in selected regional towns and cities (UCL), Australia, with major gains and losses, 2011–2016



Source: ABS census data, authors' calculations.

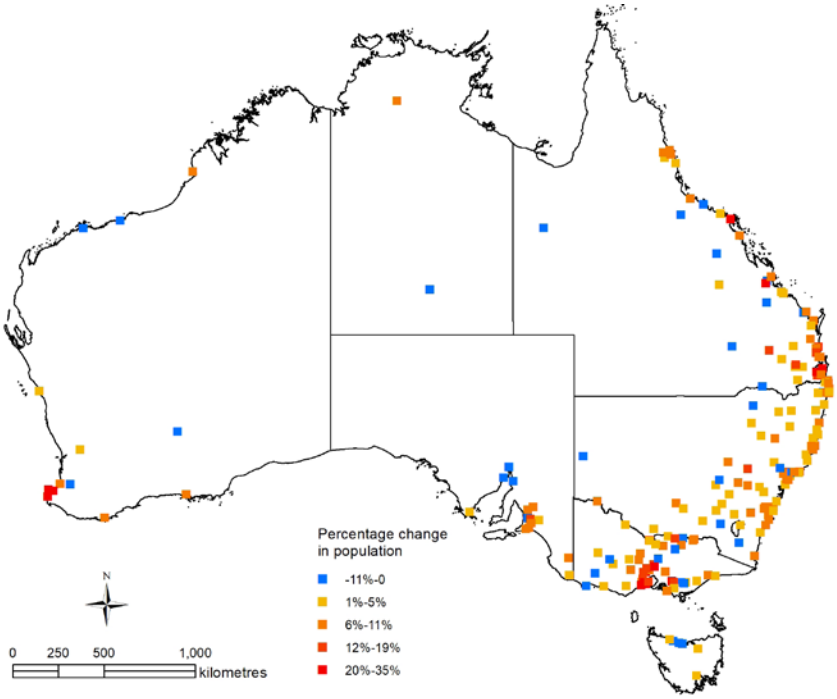
2.2.4 Population change rates

The rate of change in Australian regional cities and towns is uneven across the continent (Figure 5). A small though notable minority of regional urban centres saw population declines of up to 11 percent during the period 2011–2016. Such places tended to be those in remote inland locations, typically linked to the resource economy. In contrast, positive growth rates were unevenly spatially distributed among regional urban centres. Those with the highest population growth rates between 2011 and 2016 were principally located proximate to major cities, in particular:

- the towns south of Perth
- the Melbourne regional satellite cities of Bendigo, Ballarat and Geelong, plus nearby Torquay and Barwon Heads
- the regional urban centres in south-east Queensland.

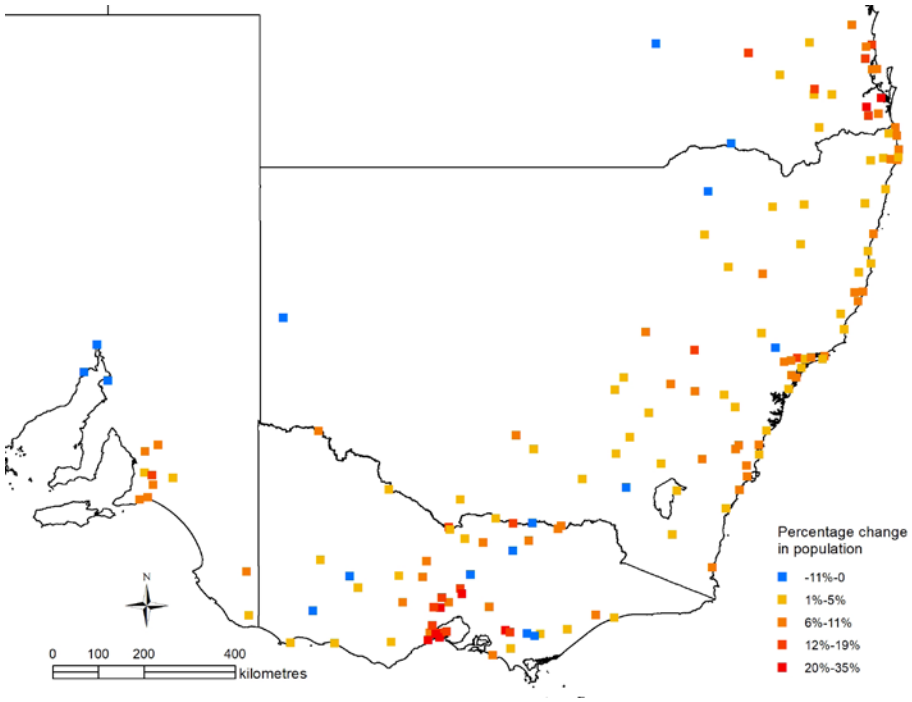
While many of the regional urban centres experiencing high population growth over 2011–2016 were located along the coast, high rates were also observed inland, including Toowoomba (QLD), Mudgee (NSW), and Chinchilla (QLD) (Figure 6). Nonetheless, simple inspection of the distribution of rates of population growth among regional towns does appear to indicate that proximity to a major metropolitan area is a strong factor underlying the growth observed. This factor will be investigated in further detail later in this report.

Figure 5: Population growth, rate, regional cities, Australia, 2011–2016



Source: ABS census data, authors' calculations.

Figure 6: Population growth, proportion, regional cities, south-east Australia, 2011–2016



Source: ABS census data, authors' calculations.

2.2.5 Indigenous populations

An element of this research is to consider the distribution of the Indigenous population within regional cities. While Indigenous people comprise approximately 2.8 per cent of Australia's population overall (ABS 2020), this group comprises large numbers within some regional urban centre populations, listed in Table 2. For example, regional cities such as Shepparton or Dubbo host Indigenous populations greater than 1,500 residents. Many regional cities, particularly in New South Wales and Queensland, host Indigenous populations that are more than three times the proportion of the local population than the overall Australian proportion of population.

Table 2: Indigenous population of regional towns and cities, 2011–2016

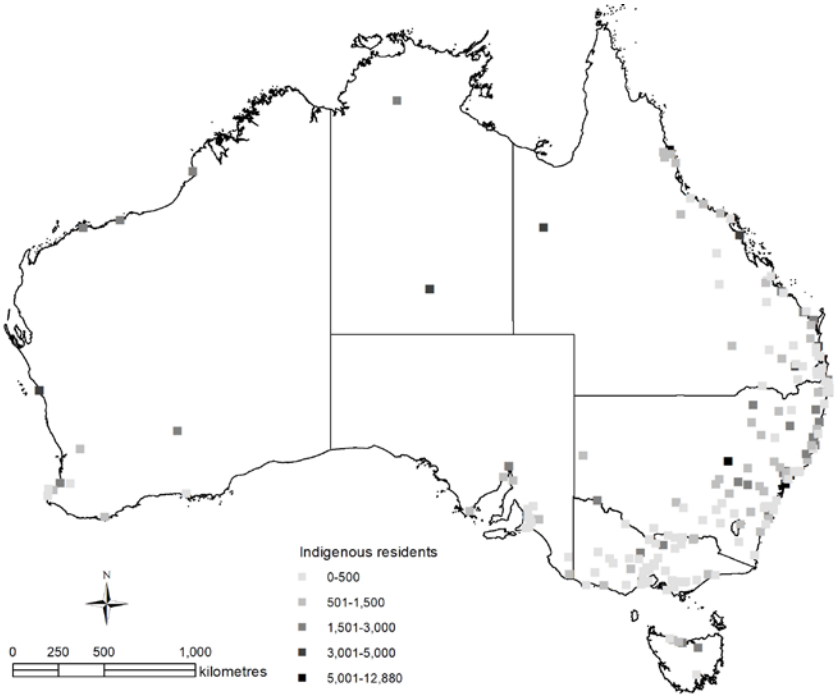
Rank	Total Indigenous population in 2016		Proportion of local population are Indigenous residents, 2016		Growth in Indigenous population, 2011-2016	
1	Cairns	12,880	Katherine	31.3%	Dubbo	3,900
2	Newcastle	12,244	Moree	28.8%	Newcastle	3,608
3	Central Coast	11,888	Broome	24.2%	Central Coast	3,223
4	Dubbo	5,424	Kempsey	22.6%	Broome	2,875
5	Alice Springs	4,304	Port Augusta	20.8%	Geraldton	2,497
6	Toowoomba	4,278	Alice Springs	20.4%	Mount Isa	2,476
7	Mackay	4,263	Innisfail	19.4%	Coffs Harbour	1,898
8	Maitland	4,216	Mount Isa	18.7%	Maitland	1,781
9	Sunshine Coast	4,107	Port Hedland	18.3%	Moree	1,674
10	Geraldton	3,093	Mareeba	17.4%	Nowra	1,476

Source: ABS census data, authors' calculations.

There is some mismatch between the regional locations where Indigenous populations comprise a large absolute population and the regional locations where the Indigenous share of the population is growing rapidly. The cities with the largest Indigenous populations by count are principally inland, whereas the locations where Indigenous populations are increasing at a high rate are inland but also in some coastal regions, such as the NSW coast (particularly the northern coast), parts of coastal Queensland, and the cities of the northern Spencer Gulf in South Australia (Figure 7). New South Wales and Queensland are particularly notable for their overall distribution of high Indigenous population growth rates both in coastal and inland locations.

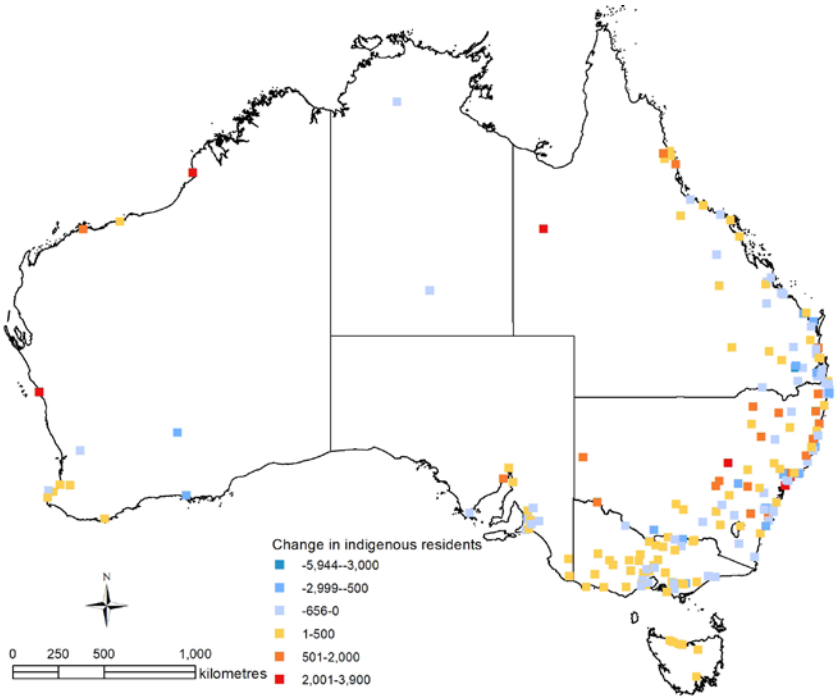
If the pattern of rates of Indigenous populations in coastal regions, which have existing relatively small populations of Indigenous people, continues, this may generate a structural shift in Indigenous population distribution in Australia. While this study cannot be considered definitive, it raises the question of an Indigenous sea change (or sun-belt shift), mirroring similar patterns observed in the Australian population overall. That said, there are a number of coastal regional urban centres where Indigenous populations declined over 2011–2016, such that the pattern may rather be one of differential concentration of coastal regional urban centre Indigenous population growth and decline (Figure 8). The higher rates of growth in some coastal zones may simply reflect the existing high numbers of Indigenous people living in those places or differences in population structure, such as a greater propensity of younger Indigenous people to migrate to coastal regions. In turn, these patterns may have implications for policies in relation to planning of services provided to Indigenous people. Further research would be needed to better understand the economic and social dynamics of Indigenous people's contemporary population, migration and settlement patterns.

Figure 7: Indigenous population residing in regional urban centres, count, 2016



Source: ABS census data, authors' calculations.

Figure 8: Change in Indigenous resident population in regional towns and cities, 2011–2016



Source: ABS census data, authors' calculations.

2.3 Migration patterns in regional Australia

Migration patterns are a primary focus of this research, due to their policy relevance and greater capacity to change population trajectory (discussed further in Section 3.1). This section of the research provides analysis of migration to and within regional Australia between the 2011 Census and the 2016 Census.

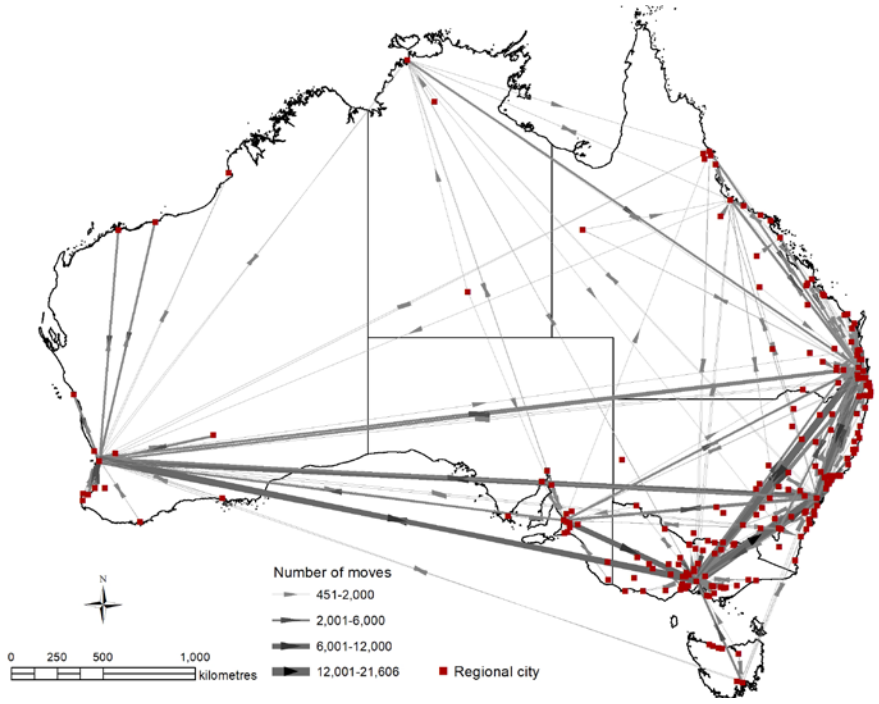
2.3.1 Internal migration

An important component of population change in regional cities is migration. For this research, we investigate regional migration dynamics using ABS census data on migration between 2011 and 2016. Migration is treated as change of residential location as recorded in the 2016 census compared to 2011 residential location. This analysis is undertaken in a disaggregated spatial scale (SA2), from which detailed spatial patterns of regional migration can be identified based on current (2016) and previous (2011) location of residence. We note that it is a limitation of the data that the analysis is not able to identify spatial patterns of migration between these two census dates.

In our analysis, we first visualise the internal net migration between major and regional cities using flow mapping (Figure 9). The term 'flow' is used analytically to refer to the gross movements between two locations over a single time period—five years in this case. We recognise that there will be intermediary movements occurring that are not captured by census data, thus the analysis does not include all such intermediary movements between 2011 and 2016.

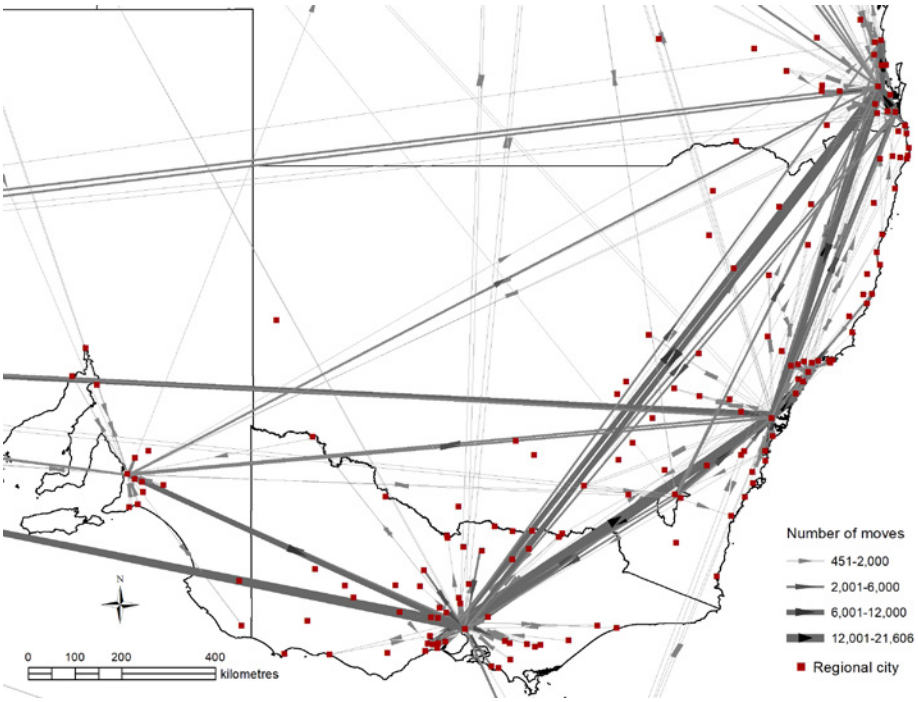
This mapping shows that within Australia, the main intercensal net migration outcomes are between capital cities and their metropolitan regions. To some extent these net flows over the five-year period exhibit gravity or mass characteristics, such that the greatest flows are between the largest metropolitan regions, such as the Melbourne –Sydney, Melbourne–Brisbane and Sydney–Brisbane pairs (Figure 10). These patterns largely reflect that the overall distribution of employment and economic activity is concentrated in the capital cities—particularly those in the continental south-east. Notably from this analysis, Adelaide as the fifth-largest capital city is relatively weak in internal migration flows: its principal migration relationship is to Melbourne, and connections to other cities are modest. In this regard it behaves like a large regional city. By comparison the most remote capital, Perth, exhibits strong flows to and from Sydney and Melbourne and, to a lesser extent, Brisbane.

Figure 9: Internal migration flows in Australia (more than 450 moves), 2011–2016



Source: ABS census data, authors' calculations.

Figure 10: Migration flows >450 movements, south-east Australia, 2011–2016



Source: ABS census data, authors' calculations.

2.3.2 Regional urban centre to major city migration

Migration movements between regional and major cities demonstrate important patterns about population change and migration. Movement of population from regional to major cities can indicate the relative economic performance of these settlement scales. Table 3 lists the major migration movements in Australia that include at least one regional urban centre in the origin–destination pair.

Many of the highest volume movements of population between 2011 and 2016 were from major cities to an adjacent regional urban centre, or from a regional urban centre to the adjacent major city. The three highest major-to-regional urban centre movements were from:

- Sydney to the Central Coast
- Brisbane to the Sunshine Coast
- Sydney to Wollongong.

All 11 of the largest net flows over the five-year period had a capital city destination. Meanwhile, the three highest regional-to-major city movements were from:

- Sunshine Coast to Brisbane
- Central Coast to Sydney
- Newcastle to Sydney.

None of the top 20 volumes of population movement occurred from a major city to a non-proximate regional urban centre. Also of note, the only origin–destination pair that does not include a capital is Newcastle to Maitland, which is a relocation of only around 31 kilometres.

The highest volume of population movement from a regional urban centre to a non-proximate major city was from Townsville to Brisbane, ranking 10th in the overall list. This demonstrates that the movement of population to and from major and regional cities is principally within metropolitan and metropolitan-adjacent zones, suggesting that such migration is expanding major metropolitan areas and increasing functional relationships. It also raises the question of whether such patterns are residential mobility—which is the change of residence—or the more substantial changes to employment and social networks associated with migration. Further research, beyond the scope of this study, would be required to resolve this (Mulder and Hooimeeijer 2012: 179).

Table 3: Migration origin–destination moves in Australia, top 20, 2011–2016

Rank	Origin	Destination	Moves	Rank	Origin	Destination	Moves
1	Sydney	Central Coast	21,606	11	Brisbane	Jimboomba	5,276
2	Brisbane	Sunshine Coast	12,429	12	Geelong	Melbourne	4,649
3	Sydney	Wollongong	10,115	13	Newcastle	Sydney	4,422
4	Sunshine Coast	Brisbane	8,641	14	Toowoomba	Brisbane	4,322
5	Melbourne	Melton	8,092	15	Newcastle	Maitland	4,255
6	Central Coast	Sydney	7,867	16	Bunbury	Perth	4,166
7	Sydney	Newcastle	6,581	17	Cairns	Brisbane	4,107
8	Melbourne	Geelong	5,888	18	Sydney	Blue Mountains	4,016
9	Wollongong	Sydney	5,633	19	Kalgoorlie	Perth	3,811
10	Townsville	Brisbane	5,278	20	Mackay	Brisbane	3,487

Source: ABS census data, authors' calculations.

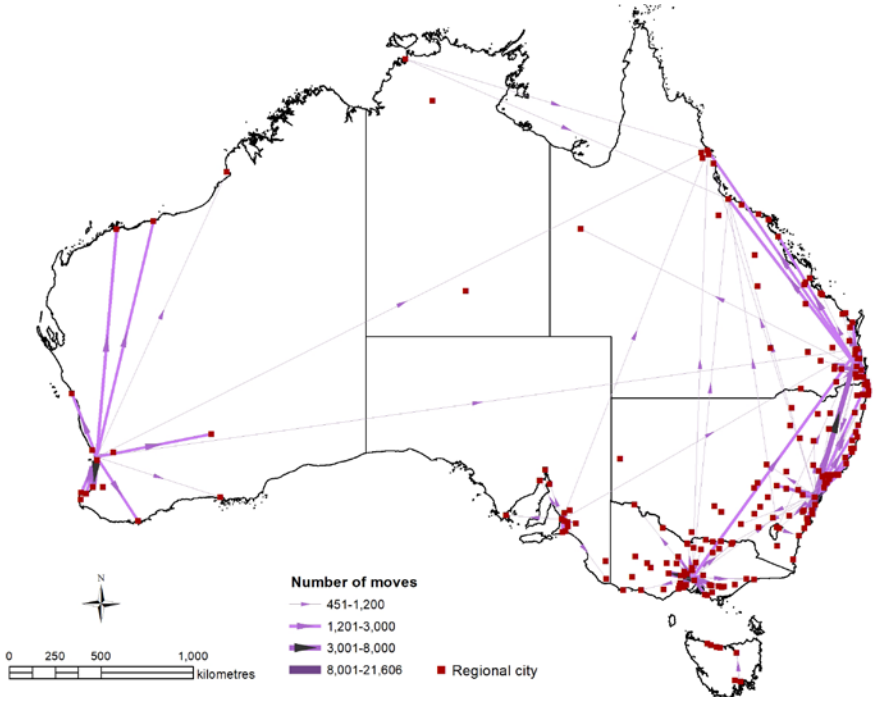
2.3.3 Major city to regional urban centre migration

We next consider migration patterns to regional cities from capital cities during the intercensal period (Figure 11). Similar to the data presented earlier in this section, this analysis shows that capital cities are the major source of migration to regional cities, particularly from the nearest capital city. In the case of Melbourne, migration is broadly radial to the nearby satellite cities and towns of Geelong, Ballarat, Bendigo, Seymour and the Latrobe Valley. For Sydney, this movement is trilateral, to the south and north coast of New South Wales, and to inland cities, including Canberra. These largely intra-state migration patterns imply close population and economic relationships between the major city and the surrounding regional cities and towns, providing further indication that such patterns are a form of metropolitan spillover (see 2.1.1), and that the patterns represent mobility more than migration. This effect is especially apparent when the focus is on south-east Australia (Figure 12).

Some long-distance major-to-regional urban centre moves occur over long distances. For example, Perth experienced large out-migration to regional WA cities, including the mining-based towns of Karratha, Port Hedland and Kalgoorlie, plus Geraldton and Albany. These movements demonstrate that Perth is the major population and higher-order economic centre within the resource-extractive regional geography of Western Australia.

In terms of regional cities that attracted population from major cities, a few highlights are notable. A degree of sun-belt or coastal migration is apparent in the major-to-regional urban centre migration patterns depicted in Figure 11, particularly from Sydney to the north coast of New South Wales, to areas south of Perth such as Bunbury, Busselton and Margaret River, and lesser flows to the coast south-east of Melbourne. Some coastal migration is apparent in south-east Queensland, as well as migration to regional centres such as Mackay, Townsville and Cairns. Adelaide also shows minor out-migration to the mining towns of Port Pirie, Port Augusta and Whyalla, and to Port Lincoln.

Figure 11: Migration flows >450 movements, from major-to-regional cities, Australia 2011–2016

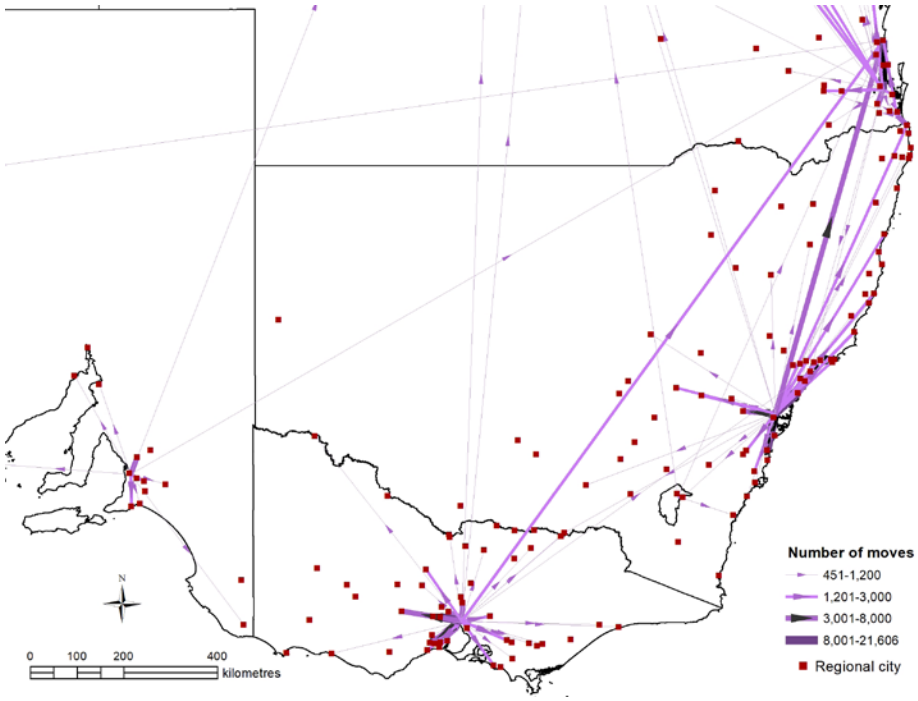


Source: ABS census data, authors' calculations.

The lack of migration to inland locations outside the immediate sphere of the major cities is also striking in the migration patterns depicted in Figure 11. The only substantial inland major-to-regional urban centre flow is from Perth to Kalgoorlie, which exceeded 1,200 movements. Minor inland flows are evident from Melbourne to Mildura, Sydney to Dubbo and Brisbane to Mt Isa, but each of these totalled no more than 1,200 persons during the 2011 –2016 period. In summary, population movement away from cities in Australia is overwhelmingly from one coastal location to another, reflecting the concentration of population in coastal areas. This appears to be a pattern of coastal spreading.

As noted, strong patterns of metropolitan centre to proximate regional centre migration are clear in south-east Australia. Melbourne and Sydney metropolitan-to-regional-centre migration movements are largely within 200 kilometres of the city, which is also evident to a lesser extent in Adelaide. This pattern is extended somewhat for Sydney, where there are sizeable patterns of longer-distance metropolitan to regional migration to the northern coast of New South Wales. There was also noticeable migration from Melbourne and Sydney to the Sunshine Coast.

Figure 12: Migration flows >450 movements, from major-to-regional cities, south-east Australia, 2011–2016



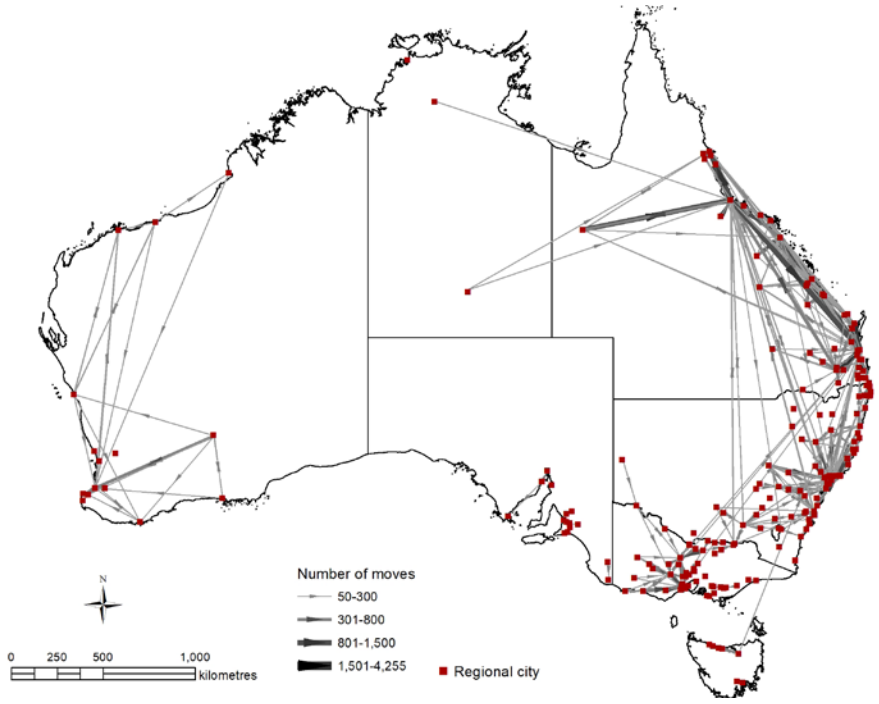
Source: ABS census data, authors' calculations.

2.3.4 Migration between regional towns and cities

In addition to migration relationships with major cities, there are also patterns of migration between regional centres (Figure 13). These patterns are observable at the national level, but more identifiable at sub-national levels (Figure 14 and Figure 15).

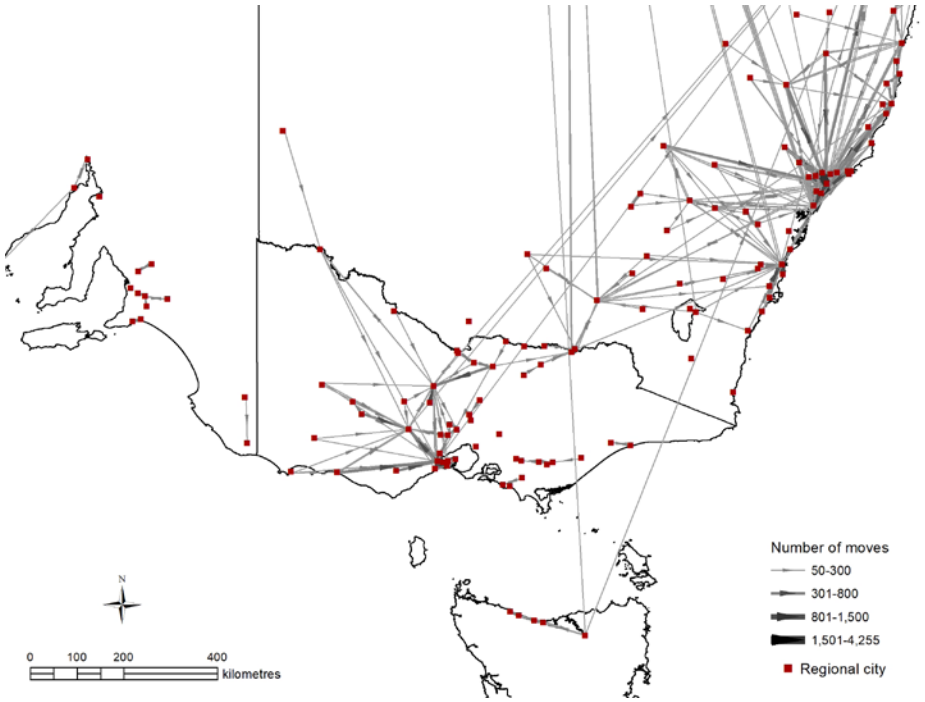
Within south-east Australia, there are discernible regional urban centre to regional urban centre flows, which indicate clear sub-national and sub-state dynamics. For example, in Victoria there is a distinct network of inter-regional urban centre migration in the west of the state, between Portland, Warrnambool, Ballarat, Bendigo and Geelong. The border city of Albury–Wodonga is linked through migration to Wagga Wagga, which in turn is linked to further centres near the Hume Highway and also to the NSW south coast. Newcastle and nearby towns have a very dense network of migration flows between them, including some flows that extend considerably inland, to cities such as Dubbo and Tamworth. A further intensive set of flows is also observable along a corridor inland from Sydney, between Katoomba and Parkes/Forbes.

Figure 13: Migration flows >100 movements, all residents, between regional urban centres, Australia 2011–2016



Source: ABS census data, authors' calculations.

Figure 14: Migration flows >100 movements, between regional towns and cities, south-east Australia, 2011–2016

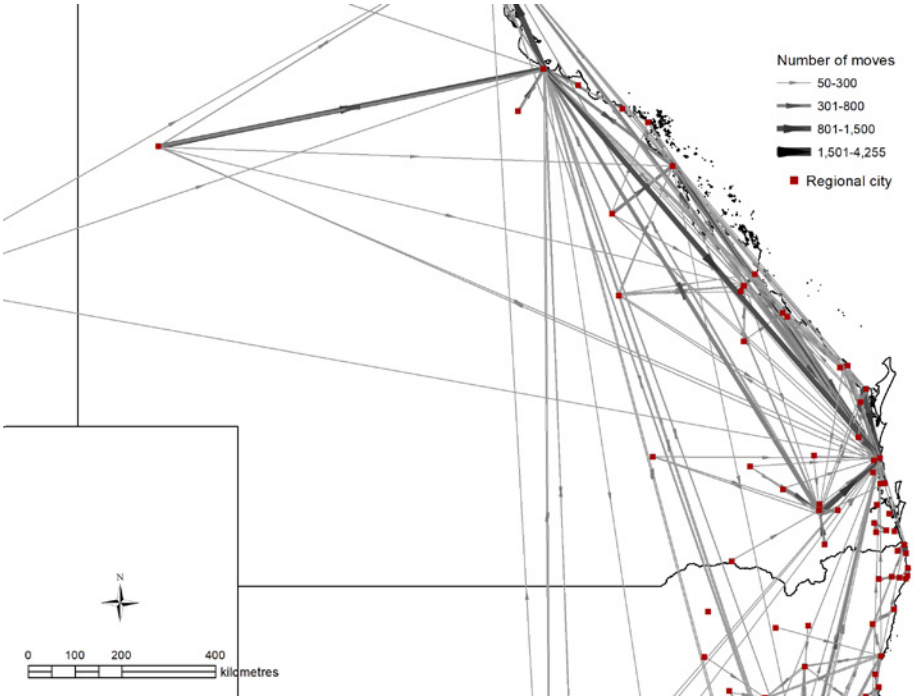


Source: ABS census data, authors' calculations.

Comparable patterns of inter-regional urban centre migration to those in the south-east of the continent are observable in south-east and central coastal Queensland (Figure 15). Many of these are north–south migration flows and include the Sunshine Coast. In particular, migration is evident between the Sunshine Coast and Townsville, as well as sizeable flows between the Sunshine Coast and the towns and cities to its immediate north. Cairns and Townsville also exhibit a strong migration relationship, as do Mt Isa and Townsville.

Within south-east Queensland, Toowoomba is clearly discernible as a major source of and destination for regional migrants, with a strong relationship with the south-east Queensland metropolitan region and the Sunshine Coast, as well as its own smaller satellite regional towns such as Stanthorpe. It is worth noting the vast distances of the migration patterns in Queensland: it is approximately 1,200 kilometres by road from the Sunshine Coast to Townsville and the Mt Isa to Townsville distance is approximately 900 kilometres. By comparison the larger regional migration flows in Victoria rarely exceed the approximately 300 kilometres distance from Portland to Geelong.

Figure 15: Migration flows >100 movements, between regional towns and cities, north-east Australia, 2011–2016



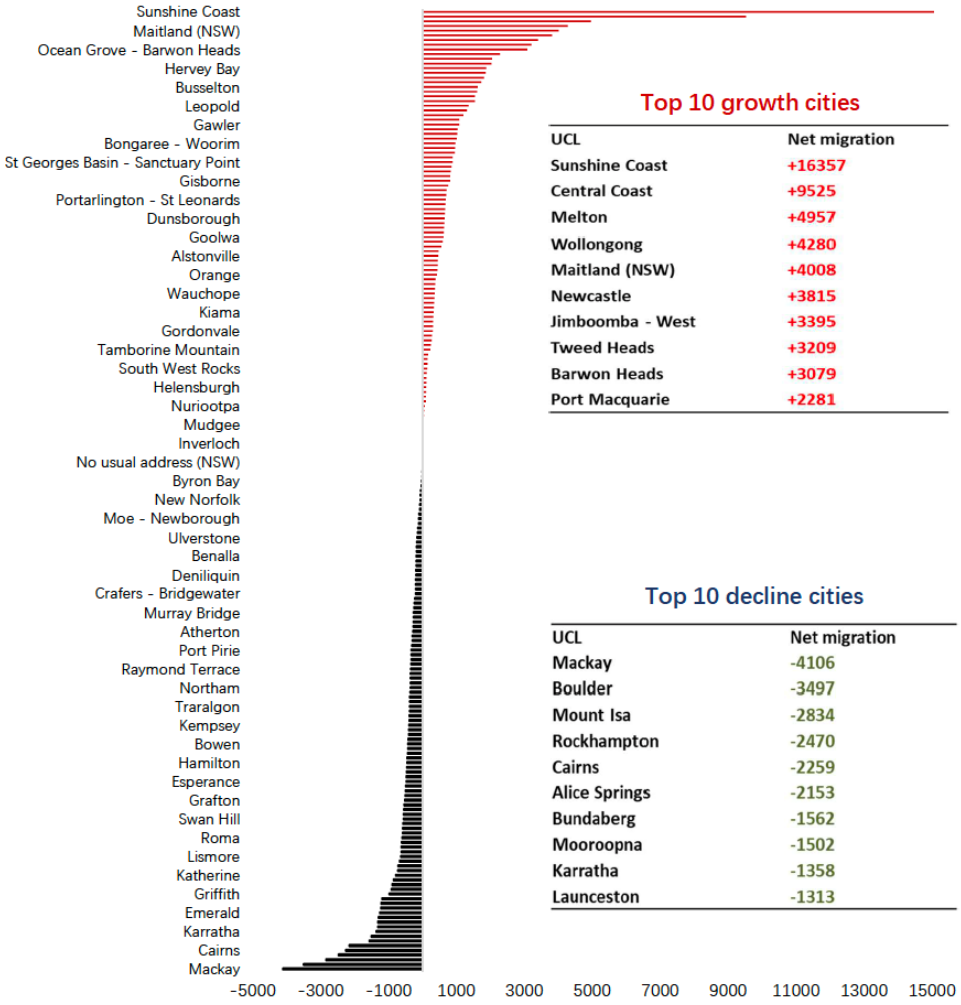
Source: ABS census data, authors' calculations.

2.3.5 Major migration gains and losses

The magnitude of internal migration gains and losses is highly differentiated (Figure 16). Some locations have experienced marked population gains. For example, the net population of the Sunshine Coast increased due to migration, a gain of 16,357 residents between 2011 and 2016. Significant migration-based growth was also observed in the Central Coast, with smaller gains apparent in Melton, Wollongong, Maitland, Newcastle, Jimboomba West, Tweed Heads, Barwon Heads and Port Macquarie.

The top three locations to lose population at scale through out-migration include the mining towns of Mackay, Kalgoorlie–Boulder, Karratha and Mt Isa, along with regional or remote towns of Cairns, Rockhampton, Alice Springs and Bundaberg. Within southern Australia, the only localities to be counted among the top-10 locations for population declines as a result of migration were Mooroopna in central Victoria and Launceston in Tasmania.

Figure 16: Net internal migration to regional towns and cities (UCL), Australia, with major losses and gains, 2011–2016



Top 10 growth cities

UCL	Net migration
Sunshine Coast	+16357
Central Coast	+9525
Melton	+4957
Wollongong	+4280
Maitland (NSW)	+4008
Newcastle	+3815
Jimboomba - West	+3395
Tweed Heads	+3209
Barwon Heads	+3079
Port Macquarie	+2281

Top 10 decline cities

UCL	Net migration
Mackay	-4106
Boulder	-3497
Mount Isa	-2834
Rockhampton	-2470
Cairns	-2259
Alice Springs	-2153
Bundaberg	-1562
Mooroopna	-1502
Karratha	-1358
Launceston	-1313

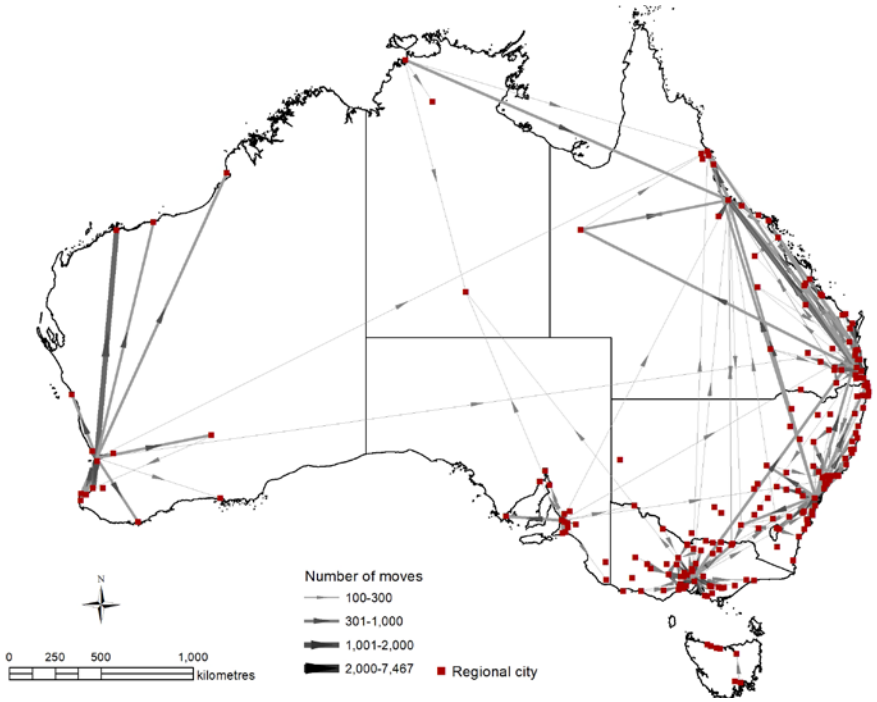
Source: ABS census data, authors' calculations.

2.3.6 Regional migration and employment

Migration flows offer insight into economic and employment-based migration motivations, a dominant topic in mobility literature, as discussed in Section 1.3. For example, migration flows associated with employment can indicate the demand for labour in excess of local labour-market supply. Similarly, the capacity of small cities to attract and absorb migration flows depends both on local economic and demographic circumstances and the profile of the migrants. Skilled migrants can be considered to be contributing to a higher level of human capital to the regional economy, given they are satisfying local labour-market demand. This section investigates the patterns of working residents who have migrated to regional cities, providing greater focus than earlier sections considering overall population movements.

The movement of workers in Australia is highly regionalised within each state (Figure 17). For example, working migration from Perth is almost entirely within the state of Western Australia, principally to major mining centres of Port Hedland and Karratha, plus Broome. It is also apparent that the other major inland flows are to mining regions, particularly Mount Isa. Also of note is that when compared to the overall migration flows to these mining areas, as shown in Figure 13, workers represent a major proportion of migrants within these patterns of mobility. This indicates a lower proportion of family households relocating to these regions, with implications for social composition of these communities.

Figure 17: Movement of working migrants from all cities to regional cities only, Australia, >100 moves, 2011–2016



Source: ABS census data, authors' calculations.

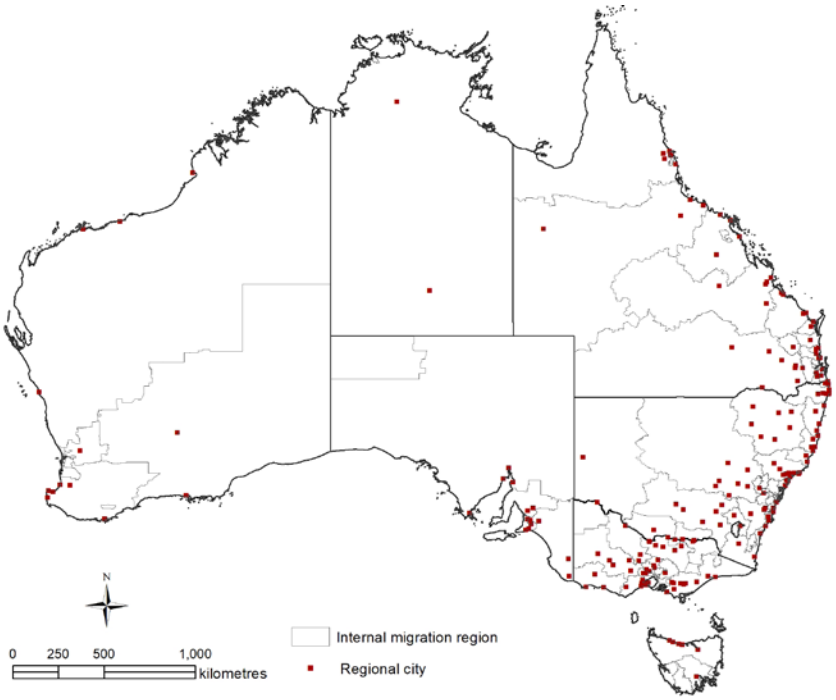
Other than the high proportion of workers within regional migration flows to mining areas, the flows of workers largely correlate to the total population flows. Some particular flows are notable. For example, Sydney serves as a key source of working migrants to Cairns and Townsville, over 1600 kilometres distant. Regional cities proximate to the major capitals also show complex working migrant patterns. For example, both Melbourne and Sydney display multi-directional flows of working migrants to and from nearby regional cities, which to some extent are associated with commuting back to the major city for work.

2.3.7 Migration regions

Migration and mobility have an origin location and a destination location. The distribution of aggregated individual movements between each residential origin and destination over a given time period can be compiled in an origin–destination matrix, similar to a commuting origin–destination matrix used in transport modelling (see Li, Shiran and Dodson 2021). In turn, this matrix allows construction of spatial migration self-containment regions (detailed in Appendix 2). The method is similar to that used for the analysis of the FERs in subsection 3.3.3. The analysis in this section reveals that migration within Australia exhibits strong self-containment at the regional scale. Populations in such broad migration regions are formed as a distinct regional community through their aggregate migration flows. A high proportion of residential relocations are within those local regions, most likely among a community that migrants know about and with which they wish to retain existing social or economic networks and relationships.

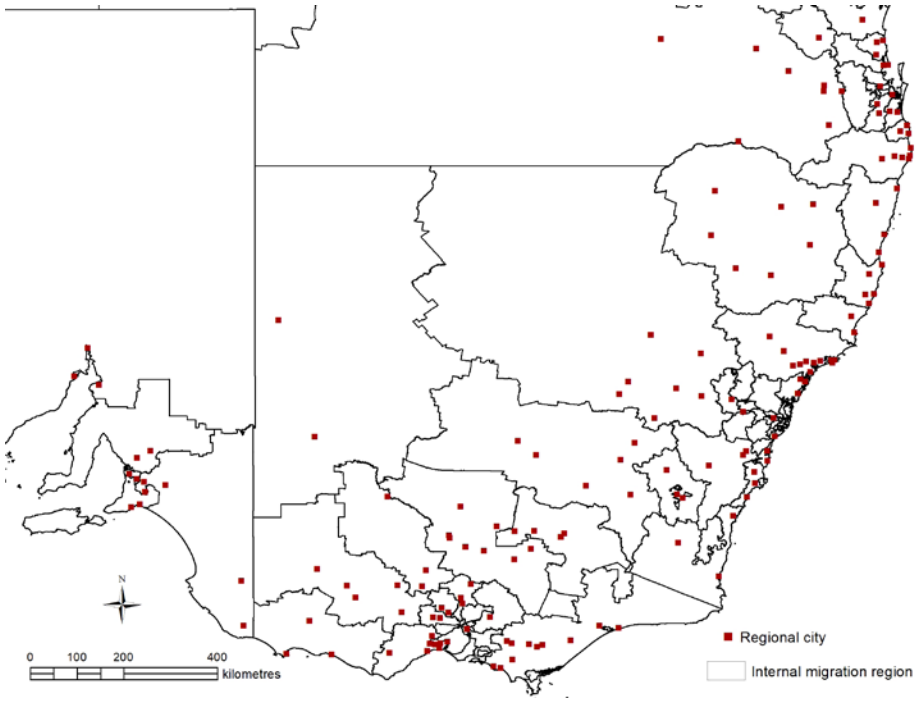
The spatial structure of migration in Figure 18 shows that the patterns typically cover a cluster of regional cities that may have similarities in demographic, wealth, employment, housing-market and lifestyle attributes. The degree of such internal migration containment tends to increase with the remoteness of regional cities. In locations where settlement structures comprise a dense set of adjacent nodes, there are many potential opportunities for residents to relocate to an adjacent centre, while maintaining existing economic and social ties: these regions are also evident in the analysis of regional migration flows discussed earlier in this section. For more remote, dispersed and smaller settlement categories, any relocation is more likely to involve increased distanciation from such connections.

Figure 18: Migration regions, all migration movements, Australia, 2011–2016



Source: ABS census data, authors' calculations.

Figure 19: Migration regions, all migration movements, south-east Australia, 2011–2016



Source: ABS census data, authors' calculations.

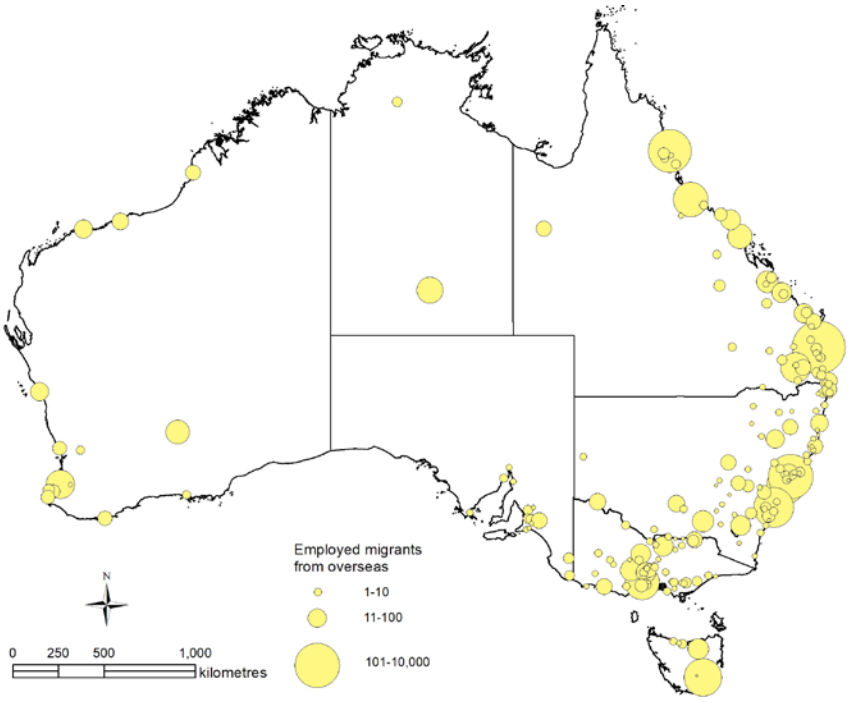
Within the migration regions we have constructed, three distinct geographical patterns can be identified that add further insights into the geographies depicted in Figure 19.

1. A set of migration regions that are associated with the internal structures of the major metropolitan areas. Melbourne, Sydney and Brisbane all display small internal migration regions. Next, there is a set of ex-urban migration regions, which are connected to, and are often contiguous with, their adjacent major metropolitan centre. Again Melbourne, Sydney and Brisbane predominantly exhibit such patterns.
2. A second series of structures is apparent among larger migration regions in the zones outside of the major metropolitan areas. Some of these exhibit a radial structure oriented towards their major metropolitan area, as in the case of Victoria—however, this pattern is quite varied and uneven. Others, particularly those associated with coastal cities from the NSW south coast to Hervey Bay, are moderately scaled. Some of these regional migration zones are linear, as in the case of south-western or south-eastern Victoria, while others exhibit length and breadth, such as those observed in northern New South Wales.
3. The remaining geographical migration structures extend across long distances, such as the migration zone extending from Townsville to encompass Charters Towers and Mt Isa, and extending to Queensland's western and south-western borders. There is a very large self-containment zone in north-west Western Australia, which covers more than half the state. In the case of the Northern Territory, the entire territory is a migration region. However, it needs to be noted that these larger regions may encompass relatively low numbers of moves among a few small centres, reflecting low population densities and settlement dispersion.

2.3.8 International migration

International migration has historically been a major component of Australia's overall population change on an annual basis. In 2018–2019, Australia received 537,800 international migrants, and a net gain of 239,600. The distribution of working migrants who arrived in Australia between 2011 and 2016 is presented in Figure 20. The destination of international migrants displays a broad gravity effect. In general, the largest numbers of migrants are attracted to the largest existing centres.

Figure 20: International migration, employed migrants, to regional urban centres, gain count, 2011–2016



Source: ABS census data, authors' calculations.

The regional cities in Australia that received more than 1,000 international migrants between 2011 and 2016 are listed in Table 4. The regional cities that received the highest number of migrants are the coastal satellite cities around Sydney and Melbourne, such as Newcastle and Geelong, as well as major coastal cities in Queensland such as the Sunshine Coast and Cairns. Cities in the inland regions and along the western coast attracted much fewer international migrants.

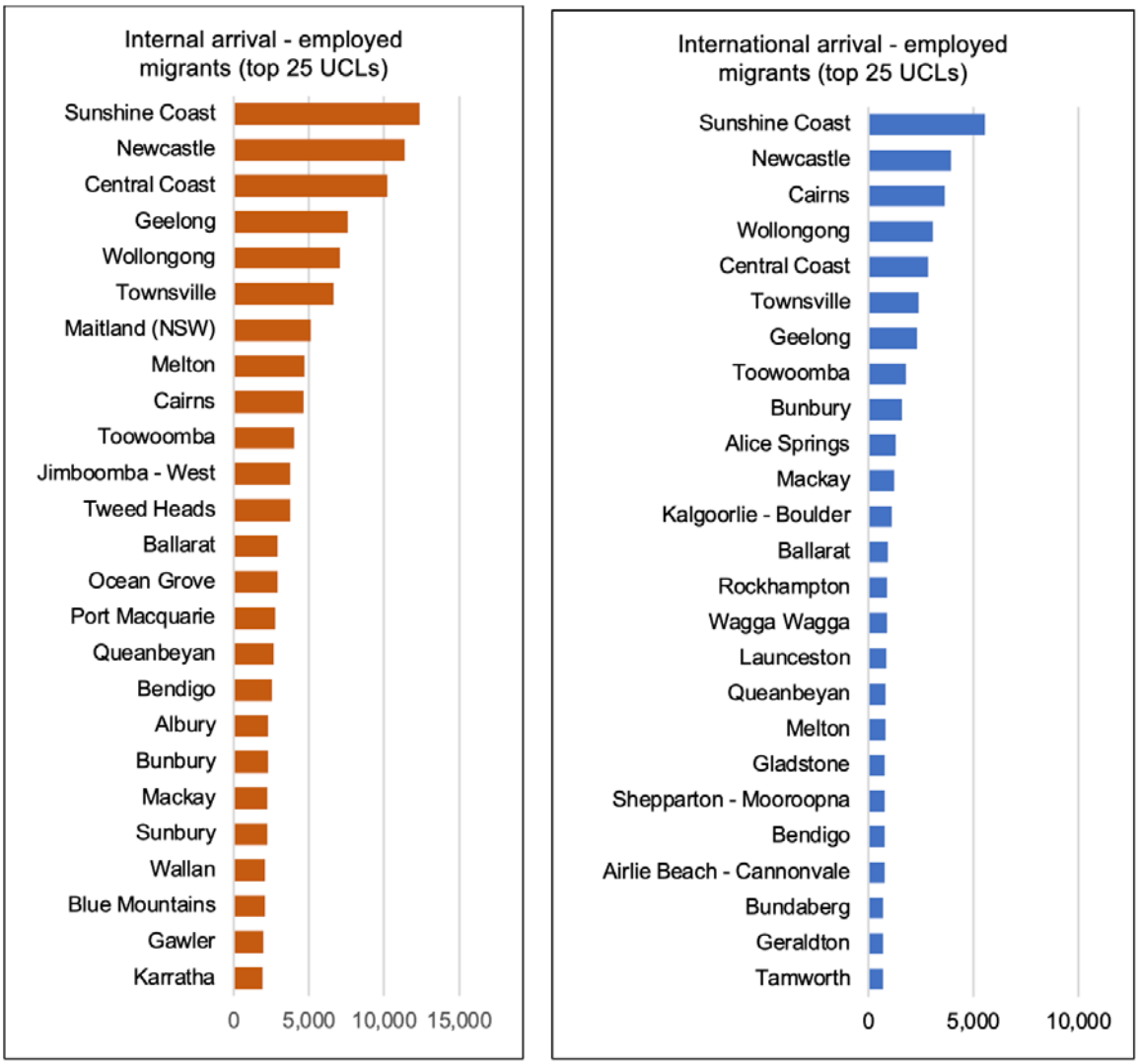
Table 4: Regional cities with overseas migration more than 1,000, 2011–2016

	City name	Indicative city type	Overseas migration
1	Sunshine Coast	Coastal, metro-proximate	10,890
3	Wollongong	Coastal, metro-proximate	9,316
4	Newcastle	Coastal, metro-proximate	8,910
5	Cairns	Coastal, remote	7,127
6	Geelong	Coastal, metro-proximate	5,850
7	Central Coast	Coastal, metro-proximate	5,766
8	Townsville	Coastal, remote	5,275
9	Toowoomba	Inland, metro-proximate	4,166
10	Bunbury	Coastal	2,986
11	Launceston	Coastal	2,710
12	Mackay	Coastal, remote	2,280
13	Melton	Inland, metro-proximate	2,083
14	Ballarat	Inland, metro-proximate	2,066
15	Shepparton–Mooroopna	Inland	2,054
16	Alice Springs	Inland, remote	2,034
17	Kalgoorlie–Boulder	Inland, remote	1,933
18	Wagga Wagga	Inland, remote	1,778
19	Gladstone	Coastal, remote	1,703
20	Bendigo	Inland	1,693
21	Rockhampton	Coastal, remote	1,623
22	Coffs Harbour	Coastal	1,565
23	Queanbeyan	Inland	1,505
24	Armidale	Inland, remote	1,281
25	Bundaberg	Coastal, remote	1,279
26	Tweed Heads	Coastal	1,248
27	Mildura	Inland, remote	1,148
28	Geraldton	Coastal, remote	1,142
29	Maitland (NSW)	Inland	1,121
30	Tamworth	Inland, remote	1,101
31	Albury	Inland, remote	1,092
32	Griffith	Inland, remote	1,067
33	Karratha	Coastal, remote	1,062
34	Airlie Beach–Cannonvale	Coastal, remote	1,006

Source: ABS census data, authors' calculations.

The comparison between employed local and international migrants to regional urban centres in Figure 21 indicates similar rank distribution. Notable exceptions are Cairns, with a higher number of international arrivals, Melton with proportionally fewer international arrivals, and Maitland, seventh on the internal list but not in the top 25 for international migrants. The data suggests a migrant preference for northern climes, with coastal Queensland urban centres appearing higher on the list for international arrivals rather than internal arrivals. Also of note is the inclusion of Kalgoorlie–Boulder, a mining centre, as a destination for international workers.

Figure 21: Net migration to regional urban centres by employed internal migrants (left) and employed overseas migrants (right), Australia, count for top-25 urban centres and localities by migration category, 2011–2016



Source: ABS census data, authors' calculations.

2.4 Policy implications

Section 2 has presented spatial population and migration data for regional urban centres in Australia 2011–2016. While more detailed analysis of economic data is undertaken in the following sections, some initial observations and policy discussion can be presented here.

The data shows that regional urban centres underwent divergent processes of population change during 2011–2016. Absolute population growth is highest among larger regional cities located in coastal regions proximate to major cities in south-east Australia, indicating population concentration in the larger regional Australian settlements. In contrast, absolute population decline tends to be found within inland and remote towns, particularly in urban centres associated with resource industries. The processes of population concentration in fewer and larger regional settlements that was evident across the 20th century appears to be continuing (BITRE 2014). International migration trends were largely similar, with most relocating to the larger regional urban centres.

As a result of the analysis, we are able to categorise population change into three main initial patterns and their policy implications:

- Larger regional cities
- Coastal urban centres
- Inland, smaller, remote and often resource-reliant towns.

Larger regional cities

Larger regional cities that are proximate to a major (state capital) city appear to be growing more (by count) than other regional areas. This implies a strengthening satellite relationship that may represent a form of expanded urbanisation associated with the major city, or 'spillover counterurbanisation' to use Champion's (1989) typology. These large regional cities, as well as the adjacent towns, present a policy and planning question in the form of demand for connecting infrastructure between them and what purpose such interventions serve, particularly in terms of the economic and employment outcomes. Further policy questions may arise where increased population in these urban centres places pressure on housing markets that may have historically been relatively cheap compared to the major city, with implications for the affordability of housing for locals.

Coastal urban centres

Coastal urban centres appear to be adding more population than inland urban centres. In particular, regional urban centres in northern coastal NSW and Queensland are continuing to gain population, many at rapid rates of growth. These urban centres will pose policy and planning questions in terms of infrastructure and service delivery, particularly of public services. There are likely to be environmental policy questions in relation to urban development as population growth pressure creates demand for urban land in contexts that may have historically not needed to exert constraint on urban expansion.

Inland, smaller, remote and often resource-reliant towns

Inland, smaller, remote and often resource-reliant towns tend to lose population compared to larger and coastal regional cities. These patterns may be associated with continuing weakness and employment declines in traditional regional industry sectors such as agriculture, or with transitions within resource-extractive industries following the mining-infrastructure investment boom of the late-2000s and early-2010s. These urban centres may pose policy issues in terms of maintaining service levels while demand declines, as well as managing legacy infrastructure, such as housing.

If the aim of policy regarding regional population growth is to alleviate the growth pressures in metropolitan areas, then these findings have two implications.

First, the concentration of in-migration and population growth in the metropolitan-proximate urban centres implies a question whether this is metropolitan expansion, rather than regional growth. Regional suburbanisation is rarely considered as an outcome of policy interventions such as high-speed rail, but these processes are not new. For example, Pakenham and Penrith have been subsumed into Greater Melbourne and Sydney, respectively, through improved transport connections. Also, given the already rapid rate of population growth in these regions, it is questionable whether further policy interventions are required.

Second, if policy is considered from the perspective of addressing issues in regional Australia rather than resolving metropolitan growth pressures, then the focus needs to be directing growth to regional centres beyond metropolitan commutersheds, where population increase is markedly lower, if not in decline.

From the perspective of policy in relation to Indigenous peoples, the patterns of Indigenous population change in part reflect the overall population patterns—but in some ways also diverge from them. Indigenous population growth is greatest in some coastal localities, although these are not always the same places where the non-Indigenous population is increasing. Some inland localities that are not seeing large overall population growth are seeing substantial growth in Indigenous residents. This suggests that Indigenous population distribution and change may have different geographies to those of the population overall. The data presented does not allow for analysis of why these patterns may vary. However, we might assume this is in part a consequence of historical differences in distribution and concentration of Indigenous peoples, such that the dynamic of change for Indigenous Australia is different to that for the wider population. This in turn has implications for policy that is oriented towards Indigenous people. Such dynamics are beyond the scope of this study, but merit further investigation.

3. Employment and economic change

Regional urban centres in Australia have undergone processes of change in recent decades, commencing with the opening up of the Australian economy to global competition in the late 20th century. This section identifies more recent trends in the economies of these urban centres:

- Employment growth in metropolitan-proximate urban centres, and decline in the remote and resource-sector dependent centres .
- The healthcare and community service, construction and hospitality and accommodation sectors have increased their share of regional employment between 2011 and 2016. Manufacturing underwent significant decline.
- In terms of employment, the larger regional centres are growing more rapidly than smaller centres, as revealed by shift-share analysis, suggesting consolidation processes as well as economies of scale and agglomeration benefits.
- Industries that are closely associated with agglomeration are concentrating in fewer urban centres, while those associated with population services are becoming more dispersed, including construction, administration and support, hospitality and retail. Manufacturing has become more dispersed, but likely because of the closure of major facilities in regional cities.
- Commuting between regional areas and capital cities increased between 2011 and 2016, both in number of commuters and distance travelled, indicating an increased dependency on metropolitan interactions.
- The correlation between population increases and lower average wages, along with population growth concentrated near the capital cities, implies that policy needs to focus on developing regional economies and better jobs.

3.1 Economic change in regional urban centres

The 20th century was a period of change for the economies of Australia's cities and towns. In the first part of the century, regional urban centres largely grew as a result of two processes.

First, improved transport and communications systems enabled wider market catchments. This provided economies of scale in a range of essential services, and led to a greater consolidation of people and employment in larger regional centres: supermarkets are primary example of this (BITRE 2014). For many regional urban centres, their increased service catchments made them hubs for surrounding agricultural producers and mining concerns.

Second, some regional urban centres in Australia grew rapidly because of manufacturing specialisations, such as Geelong, Wollongong and Newcastle (Rich 1987). For example, the Geelong census district increased its population from 11,368 people in 1921 to more than 120,000 by 1971, partly due to Ford opening its automotive factory in the city in 1925, which was followed by other large-scale manufacturers (Blainey 2013). Regional urban centres with strong manufacturing specialisations were typically located near major urban centres, which provided specialised producer services and linked to global markets via major ports (Polèse 2010).

The rise of global production networks and the reduction in tariffs and industry protections from the 1970s affected manufacturing and agriculture, particularly as sources of employment in regional areas (Dicken 2011; Rich 1987). While this downturn was keenly felt in some regional urban centres, changing patterns of consumption have provided a boost in more recent years. In particular, the healthcare and community services sectors have been a source of employment across regional Australia. Education and construction have also provided additional employment in regional areas (Toner, Denham et al. 2019). It is also important to note that to some extent, the reduction in employment is due to an increasing capital intensity, including relative to labour, in the system of production, particularly in mining and agriculture (Ellem 2016; Productivity Commission 2005). Although now dated, these employment shifts somewhat contradict both economic base theory (Hoyt 1954) and Henderson's (1997) argument that a city's size was dependent on the productivity of their export-oriented sectors—that cities could not grow by servicing themselves.

Proximity is also a factor in regional urban centre economies. There are two opposing processes discussed in the literature:

- borrowed size
- agglomeration shadow.

Borrowed size is where smaller settlements located close to larger cities can support and sustain functions usually associated with larger cities. They are in a 'position of having their cake and eating it, or they would enjoy the advantages of agglomeration without the disadvantages of size' (Alonso 1971: 80).

Agglomeration shadow is where being proximate to a primary city may conversely reduce the range of goods and services in regional centres, indicating the effect of competition. This is where the activities within the larger city crowd out the development of advanced industries or services in smaller areas nearby (Puga 2002).

Thus, regional centres proximate to a major metropolis can both benefit and disbenefit from their proximity, as different sectors within different urban systems may have different processes of competition and complementarity (Boix 2003). This is also true for more remote regional service centres, which can provide a greater range of goods and services than might occur if they faced competition from nearby settlements (Partridge, Rickman et al. 2008).

A further implication of the agglomeration shadow effect, as well as the arguments as to whether jobs follow people from Section 2.1, is that population growth is not necessarily equivalent to employment growth or economic development. The agglomeration shadow effect can be interpreted as an economy smaller than would be expected given the population size, indicating an inefficient distribution of people in comparison to economic functions (Hall and Pain 2012). Such considerations have implications for policy, both in terms of regional development strategies as well as decisions about the provision of public services in regional centres.

3.2 Employment trends in regional urban centres

This section includes a detailed analysis of employment in regional urban centres to gain deeper insight into the components of economic change, as a key regional economic indicator. This is justified on conceptual grounds through the assumption that increasing spatial economic activity leads to increasing demand for labour and labour utilisation, as well as the lack of official regional product estimates in Australia (Gretton 2013).

In this conceptualisation, labour utilisation is a principal form of economic activity. However, using employment growth as an indicator of regional economies may not be completely representative of actual economic activity —especially in sectors where mechanisation and automation have become continuing features of production. This includes agricultural industries as well as resource-extractive industries. For example, mining operations have become increasingly automated over the past two decades, leading to higher capital–labour ratios than in previous periods, which reduces the labour share of mining operations. Yet the economic value of such operations may be very high on a capital return basis.

An assessment of the impact of automation on regional employment growth is beyond the methodological scope of this project, given the availability of datasets that can accurately represent patterns. In contrast, service sectors such as those found in regional locations experiencing high population growth are less easily automated, thus potentially leading to disproportionately high employment rates relative to the value of the economic activity. Further research beyond this project would be required to better understand these dynamics.

3.2.1 Employment change in regional urban centres

This section investigates employment change in regional urban centres during 2011–2016. It provides descriptive statistics and spatial distributions as a basis for the subsequent analysis within this report.

The relationship between employment and population changes is important for regional urban centres, and causality can be bidirectional and accumulative (e.g. Trendle 2009). Regional demand for labour may result in workers and their households being attracted to regional locations, thus generating population growth in those locations. Subsequently, the population growth results in additional demand for public services, and population-driven private sectors such as retail and hospitality. There may also be places where these causalities work in the opposite way, such as declining employment resulting in departure of workers and their households, indicating processes of cumulative causation (Toner 1999).

Employment growth in regional urban centres between 2011 and 2016 was concentrated in a relatively small number of settlements (Table 5). The top nine regional urban centres for employment growth during the 2011–2016 period all had a population of more than 70,000 in 2011. This is not surprising, as higher job growth numbers may accompany high population growth, as indicated in Section 2. The top five cities for employment growth over the period were close satellites of either Brisbane, Melbourne or Sydney (Table 5). Further satellite urban centres, such as Toowoomba, Ballarat, Bendigo and Tweed Heads also figure in the top 20 for employment growth. Despite this, the top-20 list also includes some regional urban centres that are neither coastal, nor satellites, such as Albury–Wodonga, Wagga Wagga and Traralgon.

Table 5: Top 20 regional urban centres experiencing job growth, 2011–2016

Rank	Urban Centre	Total jobs 2011	Total jobs 2016	Job growth
1	Sunshine Coast	81,543	98,597	17,054
2	Central Coast	90,889	101,666	10,777
3	Geelong	68,353	78,046	9,693
4	Newcastle	130,405	139,948	9,543
5	Wollongong	85,796	93,121	7,325
6	Cairns	55,960	63,141	7,181
7	Townsville	70,694	76,939	6,245
8	Toowoomba	47,637	53,056	5,419
9	Ballarat	39,682	44,599	4,917
10	Bunbury	24,215	28,560	4,345
11	Maitland (NSW)	28,566	32,639	4,073
12	Wagga Wagga	23,463	27,292	3,829
13	Bendigo	36,799	40,330	3,531
14	Melton	8,266	11,358	3,092
15	Albury	20,937	23,936	2,999
16	Tweed Heads	16,092	18,988	2,896
17	Traralgon	9,113	11,945	2,832
18	Port Macquarie	17,349	19,774	2,425
19	Wodonga	16,247	18,433	2,186
20	Coffs Harbour	22,593	24,576	1,983

Source: ABS census data, authors' calculations.

Regional urban centres experiencing employment decline between 2011 and 2016 were principally smaller service towns distributed across the country (Table 6). These include remote resource-service centres such as Collie and Karratha, plus an array of regional agricultural service towns such as Benalla, Hamilton and Warwick. Some industrial or processing towns such as Portland, Muswellbrook and Glen Innes also feature in the top 20 for employment loss.

Table 6: Top 20 regional urban centres experiencing job decline, 2011–2016

Rank	Urban centre	Total jobs 2011	Total jobs 2016	Job change
1	Collie	7,628	4,425	–3,203
2	Wonthaggi	8,655	6,819	–1,836
3	Karratha	7,705	6,508	–1,197
4	Maryborough (QLD)	10,863	9,917	–946
5	Mackay	36,775	36,117	–658
6	Kurri Kurri	3,856	3,289	–567
7	Benalla	4,758	4,262	–496
8	Tannum Sands–Boyne Island	3,159	2,760	–399
9	Hamilton	5,214	4,953	–261
10	Emerald	5,579	5,361	–218
11	Portland (VIC)	5,285	5,076	–209
12	Muswellbrook	7,528	7,326	–202
13	Glen Innes	3,144	2,976	–168
14	Mount Isa	8,490	8,327	–163
15	Innisfail	4,300	4,151	–149
16	Sale	7,233	7,093	–140
17	Corowa	2,351	2,226	–125
18	Stawell	3,431	3,310	–121
19	Warwick	6,931	6,815	–116
20	Merimbula	3,638	3,523	–115

Source: ABS census data, authors' calculations.

The employment declines in Collie (42%), Wonthaggi (21%) and Karratha (15%) over 2011–2016, based on the Place of Work data in Table 6, represent substantial reductions. Detailed analysis of the 2011 and 2016 employment data for these three locations explains two key points for regional employment initiatives:

1. The majority of the jobs lost between 2011 and 2016 were in construction, tied to the end of major projects: 1,755 in Collie, 1,628 in Wonthaggi and 1,085 in Karratha. These losses occurred concurrent to the end of major projects such as the desalination plant in Wonthaggi and the end of the mining construction boom in the Pilbara region. Collie also lost 1,261 jobs in primary metal and metal-product manufacturing[1], compounding the loss.
2. The decline in Place of Work jobs was significantly more than the Place of Usual Residence jobs over the same period: there were 428 fewer employed residents in Collie, 119 in Wonthaggi and 649 in Karratha. The differences between the two sets of data are almost entirely within the construction sector for Collie and Wonthaggi, and for Karratha the reduction was offset by increases in health and education employment.

1 ANZSIC level 2 industry code: reduced from 1,715 to 657 between 2011 and 2016. This is due to the reduction in employment at the alumina refinery at nearby Worsley, within the SA2.

This analysis highlights that construction work associated with major infrastructure projects is temporary, both in the public sector and in mining. If the objective of policy is to support regional economic and population growth through direct temporal physical investment, greater attention should be paid to the ongoing employment outcomes. In this regard, it is worth noting the trends in the mining sector towards fewer workers and remote control of machinery (Ellem 2016).

The disparity between Place of Work jobs and Place of Usual Residence employment also indicates that it is not necessarily local residents who attain direct employment benefits from such projects, due to skill mismatches. As Bill, Mitchell et al. (2006) find in their analysis of Sydney labour markets, new employment opportunities in a location were more likely to result in increased commuting rather than reduced unemployment while, as discussed in Section 2.1, Trendle (2009) notes that regional employment growth may be met by migration. In both of these examples, the gap between local skills and the requirements of the jobs created are important, even if they are only temporary. In this regard, regional TAFE providers have an important role in connecting regional residents to emerging employment opportunities (Halsey 2018)

A recent example that highlights these issues is the proposal for a gas-fired electricity generation plant at Kurri Kurri, in the Hunter Valley in NSW. According to the environmental impact statement, the $610 million project is projected to create a peak of 250 construction jobs, but only 10 in the ongoing operation of the plant (Luger, Colman et al. 2021). It is also unclear how many residents of the upper Hunter Valley are appropriately qualified to work on major civil construction projects, which raises queries about the extent of local versus regional or national employment impact from the project.

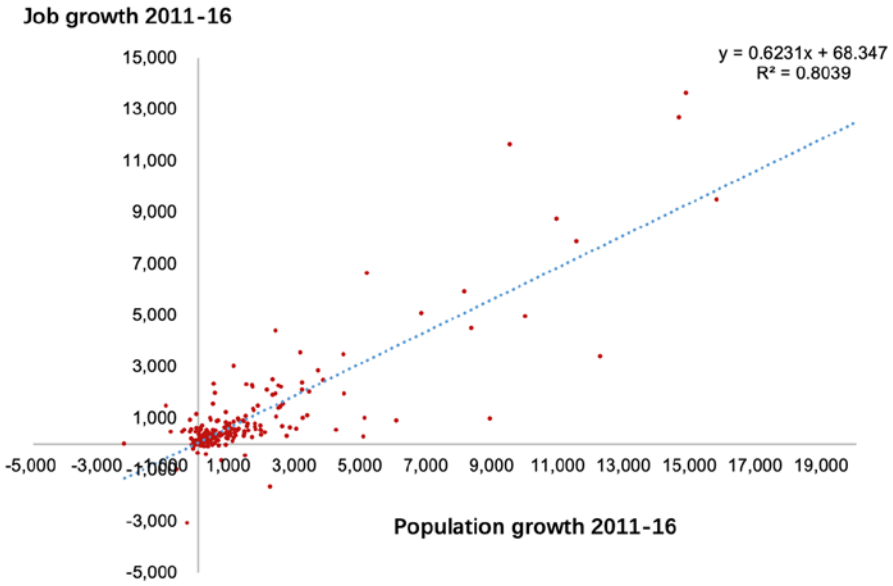
3.2.2 Economic and population change

To investigate the relationship between employment growth and population, we have plotted the growth of jobs and population for regional urban centres for 2011 and 2016 (Figure 22). Total population growth, which compares the total employment growth in regional urban centres between 2011 and 2016, shows a very strong positive relationship, such that large employment gains are associated with large population gains within regional urban centres. This relationship is clearly apparent for large changes of both factors, but is likely more complex for smaller pairs of employment and population growth.

The data shows there is a clear group of urban centres that have experienced total jobs growth of at least 3,000 jobs between 2011 and 2016, well above the average—although this group is a minority. A further overlapping subset has experienced population growth of more than 3,000 persons between 2011 and 2016. A large cluster of regional urban centres experienced jobs growth of up to 3,000 between 2011 and 2016, while also experiencing population growth of up to 3,000 persons. A small group has also seen population decline while jobs have increased, while another has seen population growth but job decline. A final group has seen both jobs and population decline between 2011 and 2016.

This data suggests that population growth, including inter-regional migration, may add human capital to the local economy—although this is context-dependent. The increase in population also increases local demand for consumption of goods and services across various industry sectors, such as construction, public services and retail, which supports employment growth in a local region. The dynamics of this relationship deserve further investigation, particularly over the long-term, to find out whether the population and employment growth is linear or exponential.

Figure 22: Population and employment change in regional urban centres, 2011–2016



Source: ABS census data, authors' calculations.

3.2.3 Distribution of employment change in regional urban centres

While there is a strong correlation between total population growth and total employment growth, the spatial distribution of population growth is highly uneven (Figure 23). There is a clear tendency for the highest regional-centre employment growth to occur in centres proximate to capital cities. This pattern is apparent in the cases of:

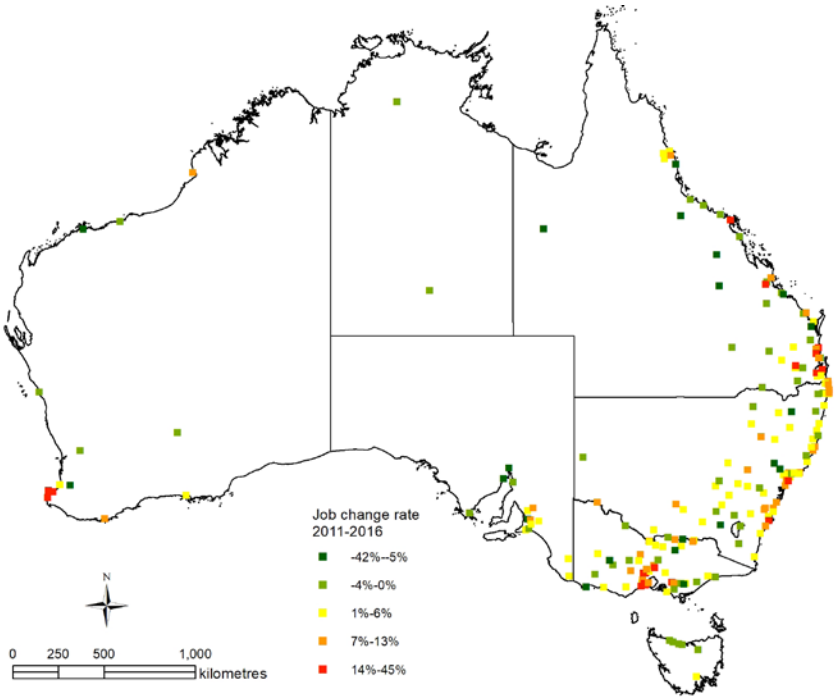
- Busselton and Bunbury on the Perth south coast
- the Melbourne satellites of Bendigo, Ballarat and Geelong
- the Sydney regional satellites of Wollongong and Newcastle
- the Brisbane satellites of Toowoomba, Sunshine Coast and Gold Coast.

Each of these clusters appears to include smaller regional urban centres that also experienced strong employment growth. In addition, there are some isolated regional towns and urban centres, such as Airlie Beach and Rockhampton, which also experienced strong proportional employment growth over the 2011–2016 period.

Moderate employment growth over 2011–2016 of between 1–6 per cent was observed for a wide set of regional urban centres. This group includes the more remote coastal towns of New South Wales, Victoria and South Australia, such as Eden (NSW) or Warrnambool (VIC), and a wide band of inland towns ranging from Victoria across New South Wales and into southern Queensland.

Low or negative employment growth was unevenly distributed across Australia's regional settlements between 2011–2016. Some of this low employment growth was coastal, such as in WA, SA, northern NSW and QLD. However, there was also a strong inland component, including many resource-dependent regional urban centres—particularly in QLD and NSW.

Figure 23: Job-change rate, regional urban centres, Australia, 2011–2016

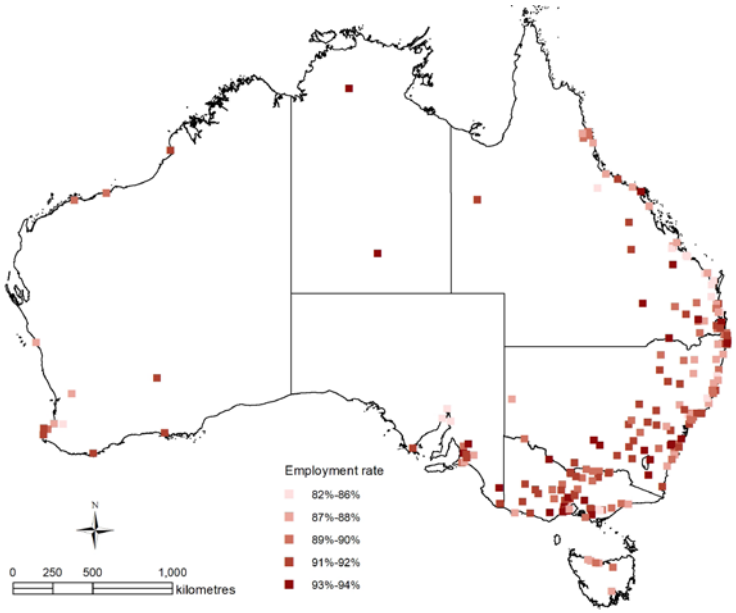


Source: ABS census data, authors' calculations.

The employment rate—which is the proportion of the labour force in employment—is spatially differentiated in regional urban centres (Figure 24). Regional urban centres with the greatest proportional employment change have tended to be those proximate to a major city, such as to the west of Melbourne, to the south and north of Sydney and around Brisbane. Although there are some regional urban centres that enjoyed strong employment growth between 2011 and 2016 that are far from a major city, these are relatively few and isolated. Cairns, Airlie Beach and Dalby in Queensland are examples of this category. The regional urban centres that experience negative employment change during 2011–2016 are mostly distant from major urban centres by at least 100 kilometres, but this is not a uniform pattern. Urban centres in the regions beyond the major metropolitan areas display a mix of negative and modest positive growth.

The prominent distinction between the rate of employment change rate (Figure 23) and the employment rate (Figure 24) is in the more remote and inland urban centres. This suggests that declines in employment opportunities in these regions are more likely to be responded to with out-migration than in other locations. Generally, people migrate to these areas for work—particularly well-paid resources-sector work during the mining boom—and leave when the demand for their labour ends. It is of note that the period of analysis in this report, between 2011 and 2016, covers the end of the employment-intensive mining construction boom.

Figure 24: Employment rate (proportion of labour force in employment), Australia, 2016

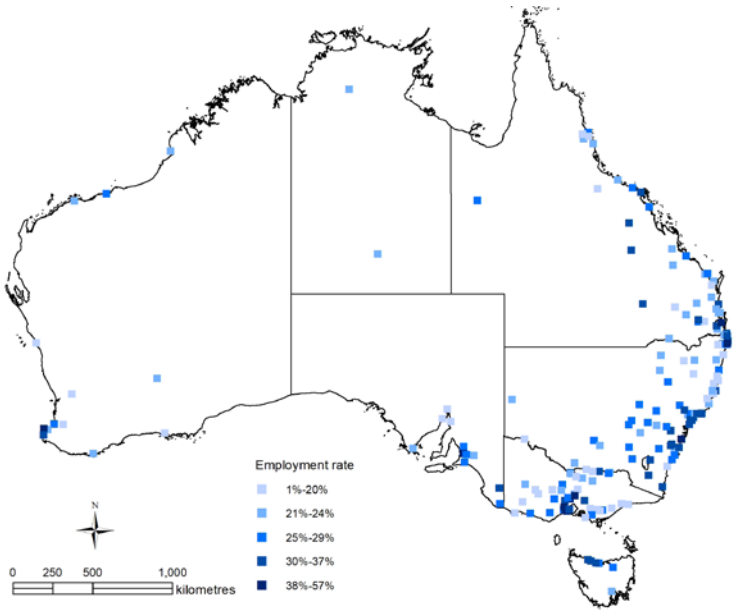


Source: ABS census data, authors' calculations.

3.2.4 Indigenous employment

Indigenous employment as a percentage of the population in the labour force, for regional urban centres, was generally higher near the capital cities (Figure 25). However, when compared to the Indigenous population distribution in subsection 2.2.5, these locations generally exhibit lower counts of Indigenous residents. Despite this, the regional urban centres in the east of New South Wales also have high percentages of employment in comparison to the total Indigenous population. Given the limited research base on the geography of Indigenous employment, more investigation is requited to better understand these patterns.

Figure 25: Proportion of population in employment, Indigenous persons, Australia, 2016



Source: ABS census data, authors' calculations.

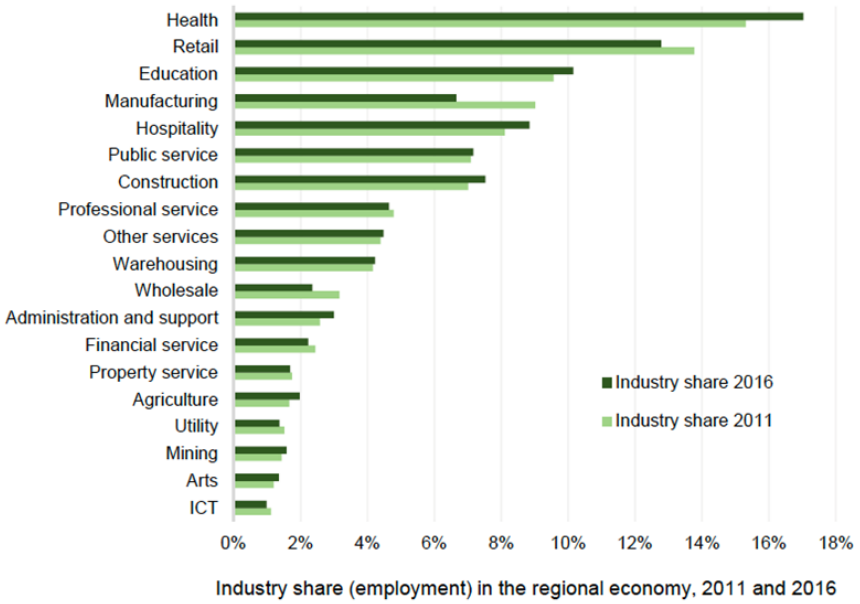
3.3 Industry sectors in regional economies

As discussed in Section 3.1, the industry composition and degree of specialisation within regional urban centres is an important factor in their growth trajectories. This section of the report begins with analysis of the aggregate industry mix in regional urban centres before detailed analysis of their changes between 2011 and 2016, providing the basis for the analysis of factors in regional employment growth in Section 3.4.

3.3.1 Industry sectors

This section considers the industry composition of regional employment change. Over the last few decades, in aggregate, Australian regional urban centres have experienced considerable change in their economic structures, as measured through employment. Change in employment in each industry sector continued during 2011 and 2016 (Figure 26). Industries that increased their share of employment were mainly population service sectors such as health, education, and accommodation and hospitality services. However, retail trade lost employment share. Construction was a further sector of increasing share of employment, typically via work generated through major residential development and public-sector infrastructure projects. Regional urban centres also proportionally declined in financial and professional services, ICT and utility sectors. For finance and ICT, advances in telecommunications have increased competition between regional and metropolitan providers, which has concentration effects.

Figure 26: Industry share of regional urban centre economic activity (per cent), Australia, 2011–2016

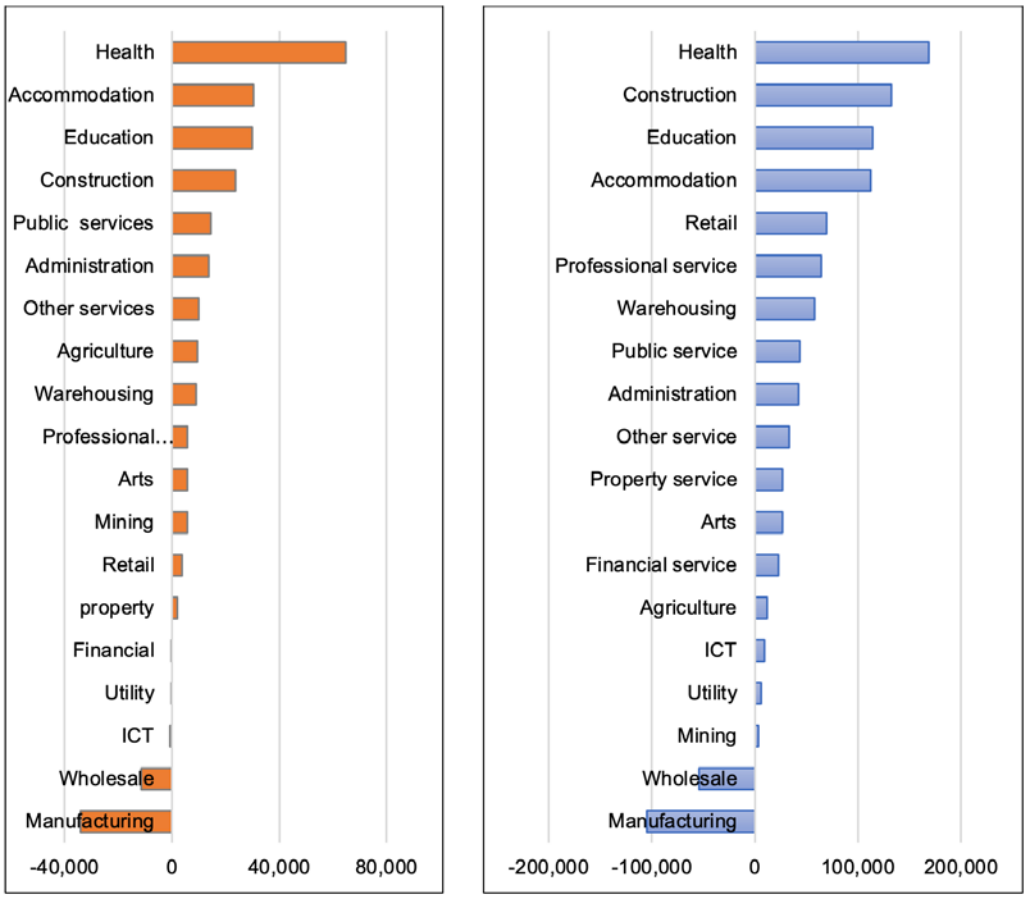


Source: ABS census data, authors' calculations.

The results also show that agriculture and mining industries in regional urban centres also increased their share of employment, although this should be treated with some caution as these industries will include significant employment in non-urban areas. There has been marked job decline in manufacturing and wholesale industries, continuing the sustained economic transition in regional urban centres. The impact of employment change on the economic structure of regional urban centres is also illustrated by changes in jobs per sector (Figure 26). It shows the shares of industries such as health, education, and hospitality service sectors are increasing. The retail industry is declining, but still remains the second-largest source of regional employment in 2016. Other important changes in regional industry share are growth in construction (from 7th to 5th), and declines in administration and support (from 12th to 11th), and agriculture (from 15th to 14th). The employment share of the manufacturing sector dropped drastically from 2011 (4th-largest industry) to 2016 (7th largest).

Further insight into regional economic change at the national level can be obtained by comparing regional employment growth by industry sector compared to metropolitan (capital city) employment growth by industry sector (Figure 27). Some common patterns include the sectors that underwent the largest growth in employment during 2011–2016, such as health and education, which were the largest and third-largest sectors to grow employment in both regions and capital cities over the period. Construction was the capital city employment sector with the second-largest growth over the 2011–2016 period, whereas for regional urban centres construction was fourth-largest, suggesting that the scale of capital cities in terms of urban development is a factor in the employment growth in construction. For example, population spillover from metropolitan areas may spur construction demand in regional urban centres. By comparison, accommodation was the second-largest growth industry sector in regional areas during 2011–2016 but was fourth-largest in the capital cities. This indicates that regional areas are disproportionately dependent on tourism compared to capital cities.

Figure 27: Change in jobs by sector, regional urban centres (left) and capital cities (right), Australia, 2011–2016



Source: ABS census data, authors' calculations.

Public services and administration were more important as employment growth sectors for regional urban centres than for metropolitan areas (Figure 27), which may imply weaker commercial sectors in the regions. Coordination sectors, such as warehousing, were stronger in the capital cities than the regional urban centres, reflecting the high-level logistical function of the larger settlements, along with processes of consolidation and centralisation in these sectors. Professional services, retail, ICT, property and financial services were less important to employment growth in regional urban centres than they were for capital cities, whereas the converse is the case for mining and agriculture.

Overall, these patterns demonstrate that, in general, regional urban centres are reliant on different sectors for employment growth than the metropolitan sectors, and also that sectors associated with higher incomes are more associated with metropolitan employment growth than with regional centre employment growth. This differentiation in employment growth sectors and incomes may provide some explanation for metropolitan-centric migration flows. Regional workers who increase their skills may find greater opportunity to use those skills in the deeper metropolitan labour markets.

3.3.2 Components of regional economic change: shift share

This section investigates the components of regional employment change. While overall figures on employment growth can offer a coarse indication of economic performance, the composition of this performance is not readily evident. Economic performance may be the result of various dynamics, some of which are related to conditions local to the region (endogenous) while others may be result of fluctuations in industry sector performance, such as national economic conditions or changes across aggregate industrial sectors. It is useful to analyse the contribution of each of these components to the extent of growth at the regional scale through a detailed analysis of the relationship between regional, industry and national economic change factors. The effects of endogenous factors on regional shift in Australian cities has been previously examined thoroughly by Stimson, Flanagan et al. (2018).

To investigate the compositional dimensions of employment change for regional centres, we first conduct a shift-share analysis of employment change. The purpose of this analysis is to understand the variation in the employment change across regional urban centres in relation to national and industry changes. Shift-share analysis breaks down a regional employment shift—growth or decline in employment—into three individual shift components:

- national shift
- industry shift
- regional/local shift.

The analysis uses the three shift components to understand at a national level which component made the specific regional economy different to the overall regional economic change. Table 7 lists factors that are considered to influence each shift component. The underlying idea is that regional economic performance can be shown by decomposing (or breaking down) regional employment trends from national and industry trends.

Table 7: Description of shift-share components

Shift components	Economic change captured	Influential factors
National shift	• Overall regional economic growth in Australia	• The scale of local economy (total employment)
Industry shift	• Growth and decline in industry sectors	• National economic structural change • Local industry composition
Local/regional shift	• Growth or decline in a regional urban centre attributed to local factors	• Local population change • Local human capital: age/skill/education • Labour productivity: employment rate/work hour • Type of industry and skill demand • Income factors • Location and remoteness • Interaction with capital cities • Transport connectivity and infrastructure • Local housing market • Performance in regional economy

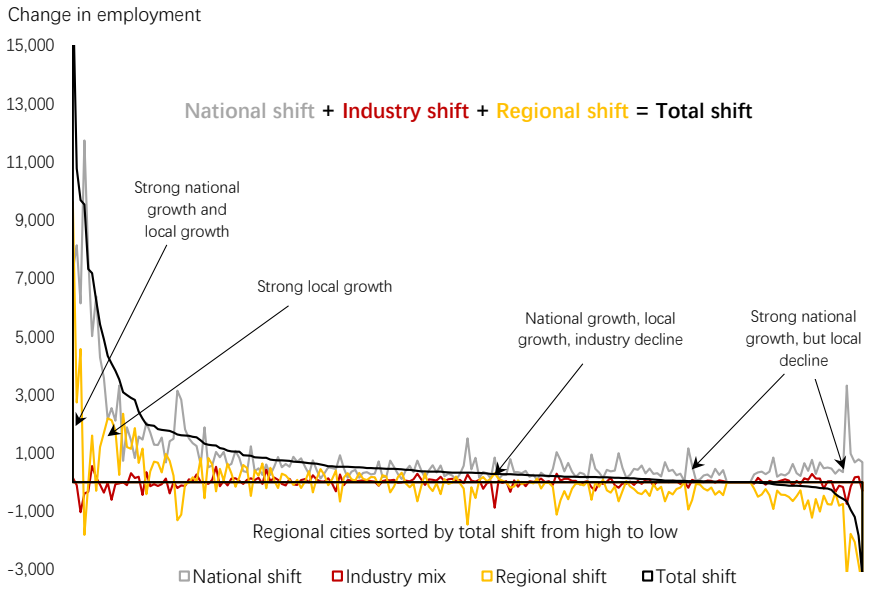
Source: Authors.

Shift-share analysis is applied to ABS census data between 2011 and 2016 to calculate the shift components of employment growth for each regional urban centre (Figure 28; see also Appendix 1). The distribution of shift components was calculated for all regional urban centres, and sorted by the total shift (actual employment change) from high to low. The national shift component (grey) distributes national employment growth to regional urban centres in proportion to the urban centre's level of employment. Therefore, the variation of this measure only reflects the different economic scale (base employment) of regional urban centres.

Next, the variation of industry mix component (red) applies national growth and decline in industry sectors to the sectoral composition of employment in each regional urban centre. A positive industry mix means a regional urban centre has a greater share of employment in industries that saw overall national high growth. A negative industry mix measure reflects an overall industry disadvantage for that regional centre compared to the national industry. Estimating regional shift is the primary purpose of undertaking shift-share analysis, as by decomposing the national and industrial shift contributions in regional employment change, variations arising from regional factors become apparent.

The observed employment change is presented for regional urban centres (in black), in descending order (Figure 28). For example, this analysis shows that some urban centres exhibit a higher national shift (arising in part from their larger employment base) and a positive industry mix. As the analysis uses absolute employment change between 2011 and 2016, there is a strong correlation between national shift and employment change, as indicated by the relationships between size and growth discussed previously in this chapter. For most regional urban centres included in the analysis, the industry mix is a marginal factor compared to the overall employment changes, indicating that local regional factors exert a more important role in shaping employment growth outcomes.

Figure 28: Shift-share components of employment growth (count) for regional urban centres, 2011–2016

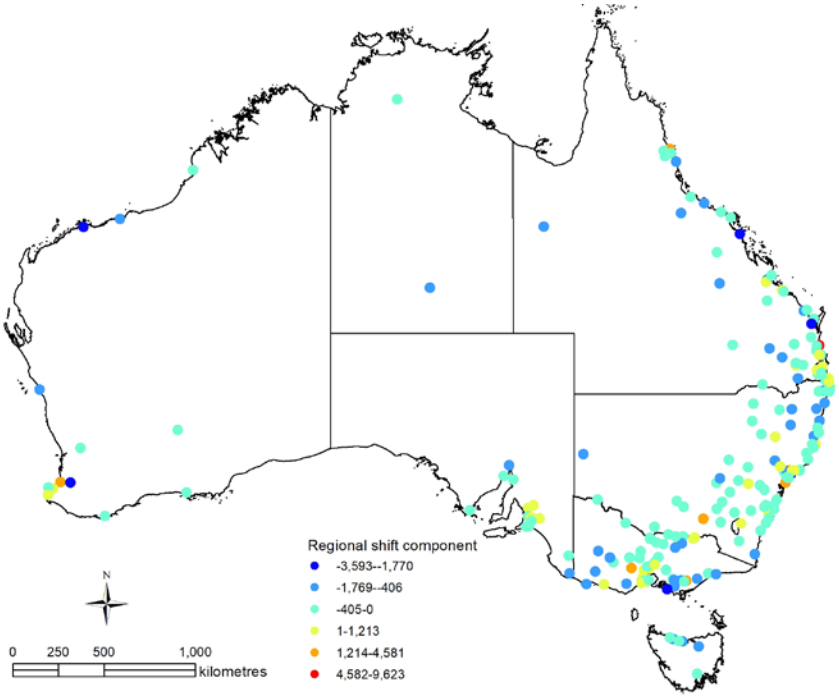


Source: ABS census data, authors' calculations.

The total shift is similar to the data in Section 3.2.1: high-employment-growth urban centres like the Sunshine Coast are to the left, and declining urban centres to the right. The high-employment-growth locations experience substantial contributions from the regional shift in addition to the national shift, which is proportional to the size of the urban centre. In other words, these urban centres have grown at greater rates than in proportion to their size in 2011. The notable upward grey spike in national shift to the right is Mackay, where the employment of 36,775 in 2011 would indicate an increase of nearly 4,000 jobs. While the industry mix was negative for Mackay, regional shift is the prominent factor based on the shift-share analysis, indicating that local factors were significant in the employment decline in this instance. The other urban centres to the extreme right of Figure 28 are similar, in that regional shift accounted for most of their decline.

The distribution of the regional-shift components in regional urban centres indicates uneven growth patterns. Geographically, the urban centres with a positive regional-shift component exhibit a degree of concentration near a capital city (Figure 29). For example, many urban centres to the north and west of Melbourne and the north of Sydney display a positive regional-shift component, indicating employment growth greater than expected from their 2011 size and industry mix. As discussed in Section 2.4, this indicates a concentration of growth and development in regions proximate to the state capitals, while the more remote regions are declining more than indicated by the changes in the overall economy and its constituent industries. This is underscored by the negative regional shifts in remote mining-focussed urban centres such as Mount Isa, Broken Hill, Port Augusta and Karratha.

Figure 29: Regional-shift component of employment growth for regional towns, 2011–2016



Source: ABS census data, authors' calculations.

Urban centres with negative regional shift are typically located in the remote and inland regions in each state. Also, some are found along the coast, where there may have been a degree of residential and urban development. Many of these centres can be characterised as principally tourism or retirement towns with limited access (or attractiveness) to skilled human capital, markets or advanced education and training to sustain industry and employment growth.

A regional centre's regional shift may also be negative as a result of an uneven distribution of national growth. For example, the employment growth in more remote centres is less than the pro-rata allocation of national shift between 2011 and 2016 (Figure 29). The frequency of negative regional shifts in remote Australia, and a general indication of declining regional shifts with distance from the major cities is also noteworthy, as it suggests the flow of economic activity is towards the major cities, not just into them.

In some instances, the use of broad industry categories to assess industry shift may also lead to overestimates of regional shift. For example, construction industry employment has grown overall, but in locations like Wonthaggi, where major projects have come to an end, employment in the heavy and civil-engineering industry subsector had declined. This highlights the place-specific and temporal nature of construction employment, which is of relevance to policy.

3.3.3 Functional economic regions and interactions

This section investigates FERs across Australia. Regional urban centres necessarily have interactions with the national level economy—however, much of this interaction is mediated through networks of exchange. While markets for goods and services may be coordinated and accessed through extended supply chains, labour is likely to be sourced within local labour markets and thus can provide insight into the structure of regional economic relationships and dynamics. Such labour-market interactions can provide insight into the ways that regional urban centres are linked to each other, including scale and hierarchy, and the extent and magnitude of functional economic relationships.

In this section, we examine how economic change in a regional urban centre is associated with economic change in other urban centres within a functional regional economy. This analysis assumes that there is a strong regional dependency between some urban centres and their hinterlands, but not others. Regional studies often analyse spatial dependency by spatial lag—in other words, the circumstances of a region are correlated to those of the adjoining or nearby regions (Stimson, Mitchell et al. 2011a). Minimising the spatial lag between regions, or maximising the spatial lag within regions, provides a geography for analysis that reduces the impact of arbitrary boundaries on the outcomes, such as local government areas.

Interdependence between regional centres is captured in the analytical construct of the functional economic region (FER) (Mitchell and Watts 2010). A FER typically delineates discrete internally interconnected urban and regional spatial structures that contain a high level of internal labour-market capture of the resident labour force. Such analysis is undertaken using journey to work (JTW) data as recorded in the ABS census, which includes the origin and destination of each work trip. Using quantitative techniques, these origin and destination pairs are assessed and sorted to identify zones of relatively high self-containment. A new method for constructing FERs has been developed for this report, as described in subsection 1.4.2, which removes the need to identify a set of urban centre nodes that FERs are constructed around, as was common in previous methods. Given the distribution of regional urban centres, which can be remote and isolated as well as clustered, the advantage of the approach described in subsection 1.4.2 is that it allows for FERs without an urban centre, as well as FERs with multiple urban centres.

The FERs identified for Australia in 2016 are presented in Figure 30 and Figure 31. They present a spatial differentiation of the country into economic subregions, which present high levels of economic connectivity, as shown by commuting patterns. As indicated in the earlier methods discussion, some FERs contain one regional urban centre, others have none, and some have two or more with strong economic dependency or functional relationship with each other (Table 8). The 246 FERs identified in Australia contain 198 regional centres. Of those that contain regional centres, 39 contain a single centre while the remainder include more than one centre. Most cities interact with at least three other centres, while around a quarter interact with just one other centre. Approximately one-eighth of centres interact with two other centres.

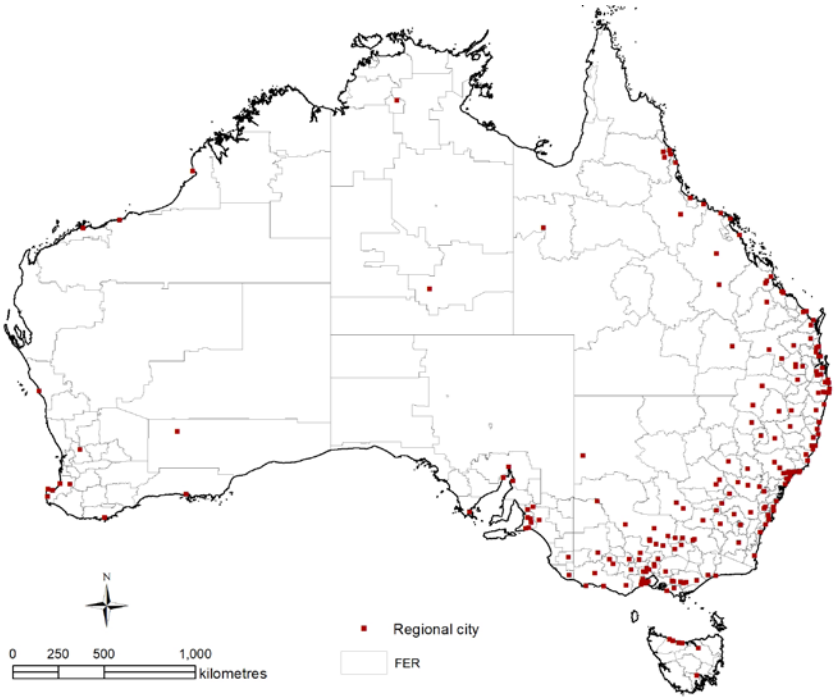
Table 8: Spatial dependency of regional urban centres, 2016

Number of FERs in Australia	Number of regional centres	Single-urban centre	Cities interact with 1 other city	Cities interact with 2 other cities	Cities interact with 3+ other cities
246	198	39	50	27	82

Source: ABS census data, authors' calculations.

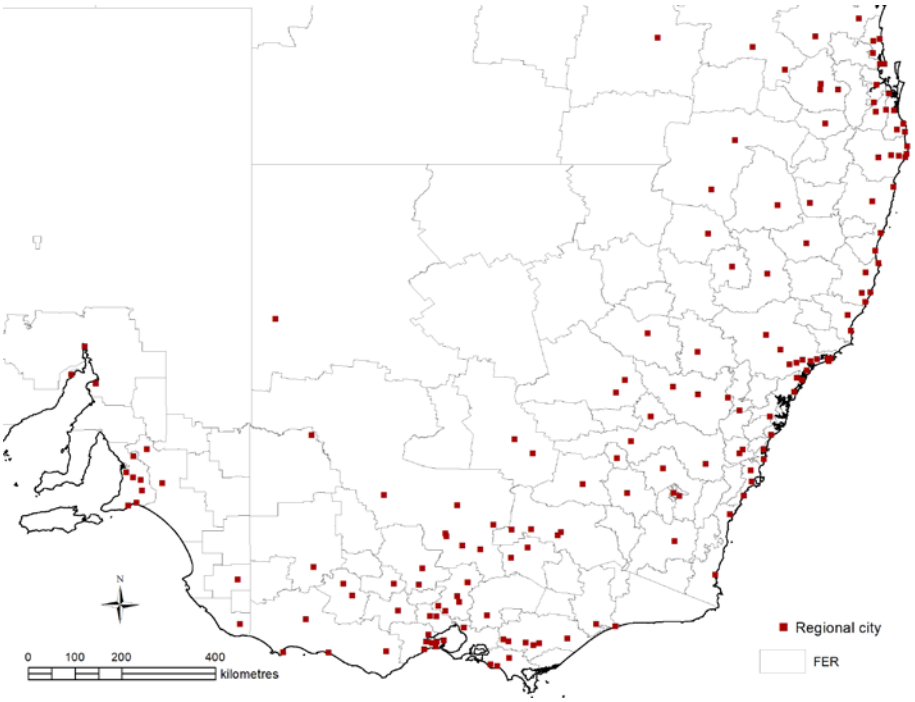
As this method of FER configuration does not start by identifying a nodal centre to construct a region around, we can also test regional interactions between urban centres. Regional urban centres near the coast or a capital city tend to be more interdependent with others within a FER, whereas the inland regional urban centres are more economically independent, which can be attributed to the greater distance between centres.

Figure 30: Regional urban centres within FERs in Australia, 2016



Source: ABS census data, authors' calculations.

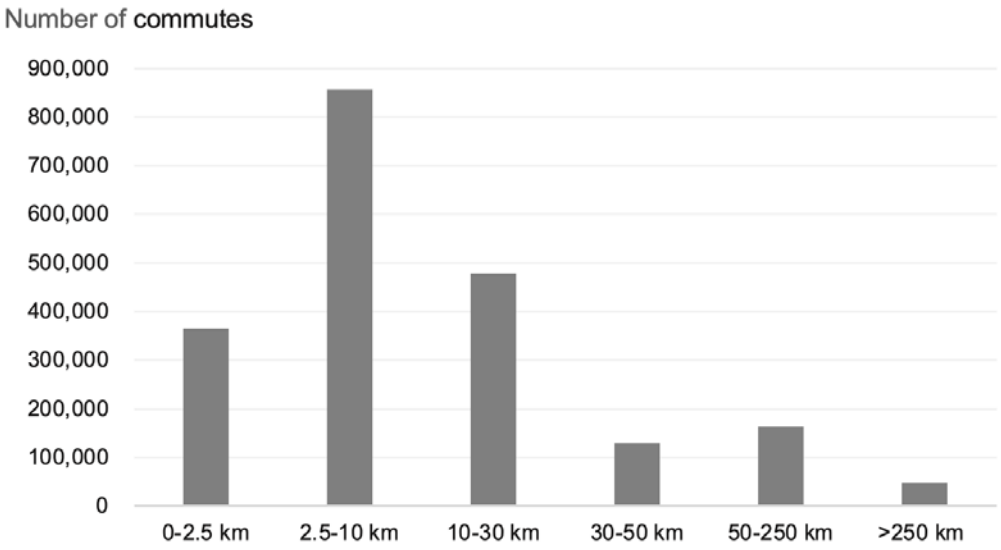
Figure 31: Regional urban centres within FERs in south-east Australia, 2016



Source: ABS census data, authors' calculations.

The scale of the spatial dependency of regional urban centres can in part be represented by the distances travelled for work journeys (Figure 32). This data shows that commuting distances in regional urban centres are short, with most work journeys being no more than 10 kilometres. This suggests that employment in regional urban centres is self-contained to a large degree. Notably there are a sizeable number of commutes between 50–250 kilometres in length, indicating relatively modest levels of inter-regional commuting.

Figure 32: Distribution of journey to work (JTW) distance in regional urban centres, 2016



Source: ABS census data, authors' calculations.

3.3.4 Spatial processes in FERs

This section considers spatial processes within FERs. By comparing the change in employment between the urban centres and the FERs—which can be seen as representative of their service and labour-market catchments—processes of change within regional Australia become apparent, as set out in Table 9. Changes in employment in the FER and urban centre, depicting the spatial distribution of these processes, are shown in Figure 33. The comparator spatial units are the FERs constructed through analysis of ABS census commuting flows and the ABS urban centre or locality (UCL) geographies derived from the ABS census calculations of settlement patterns, based on population density and contiguity of urbanisation. Note: this analysis focusses only on urban centres above 5,000 population.

Table 9: Employment change types, UCLs and FERs

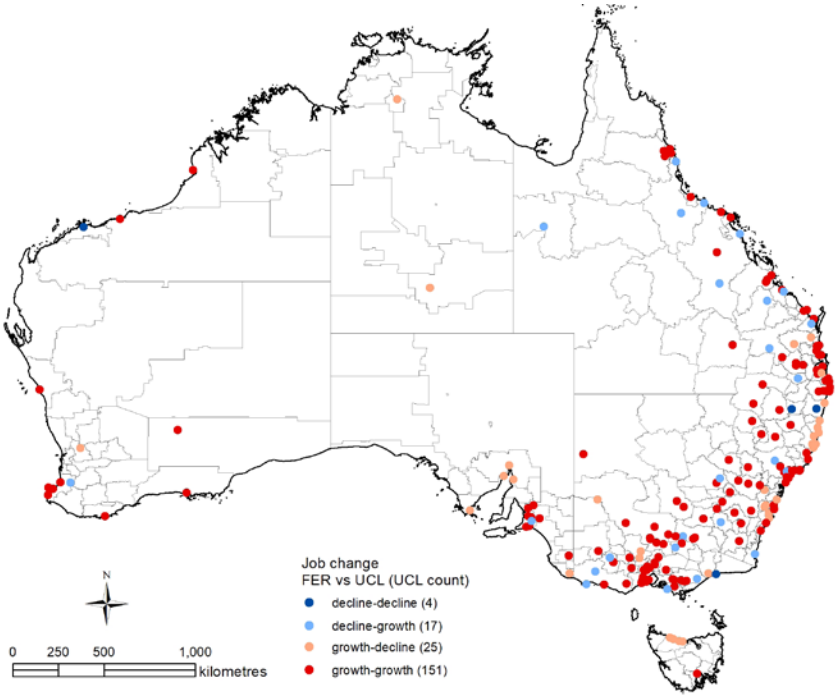
		FER	
		Decline	Growth
UCL	**Decline**	4 UCLs: Employment is being lost across the region	25 UCLs: Out-of-centre employment growth while major centre declines: possibilities include primary industry and regional tourism
	Growth	17 UCLs: The regional urban centre is growing, but its catchment is in decline. The change is a concentration of employment within the urban centre, possibly at the expense of smaller settlements in the surrounding region	151 UCLs: Indicative of strong growth in the regional economy, as both the major centres and surrounding regions increase in employment

Source: Authors based on ABS census data.

Of the 197 regional urban centres—referred to here as UCLs—to align with the data, 135 experienced employment growth in their FER and the UCL, equating to 69 per cent of the total. The 17 growing UCLs within declining FERs tended to be located further from the state capitals, including primary-industry centres such as Port Lincoln, Mildura and a collection of urban centres along the northern NSW coast: this indicates that population and services are consolidating in the regional centre as the outlying areas decline. The outback service hubs of Katherine and Alice Springs were also in this category. As some FERs have more than one UCL, there are some FERs with both growing and declining UCLs, such as Sale (growth) and Bairnsdale (decline) in Gippsland (VIC), and Dubbo (decline) and Parkes (growth) in central NSW.

There are also two notable clusters of growing UCLs in declining FERs. They are on the northern NSW coast, and in the north of Tasmania. The four UCLs in northern Tasmania are all within the same FER, which indicates concentration of economic activity across the northern part of the state.

Figure 33: Employment change in regional urban centres and FERs, 2011–2016



Source: ABS census data, authors' calculations.

3.3.5 Industry specialisation and changes

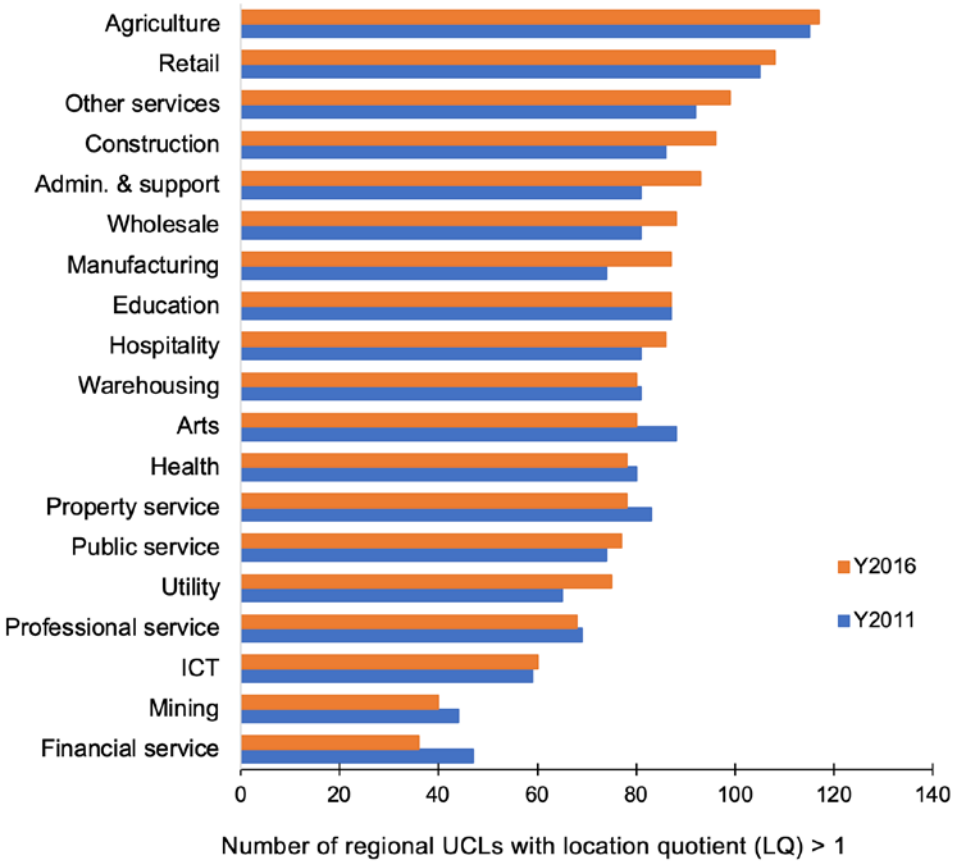
This section analyses the industry specialisation in regional urban centres and regional variations. The calculation of industry specialisation in a regional urban centre is explained in Appendix 1. The high level of industry specialisation means a high proportion of local employment within the leading industry in a city. The effect of industry specialisation on regional economic growth has been examined in previous research, concluding that the performance of regions based on their industry specialisation is diverse, depending on the type of industry specialisation and the scale of the local economy (Beer, Akshay et al. 2020).

To explore the shift in industry specialisation between 2011–2016, we conducted a location quotient (LQ) analysis of industries in each of the regional urban centres in scope.

The LQ measures the level of employment concentration of an industry in a regional urban centre relative to its national distribution. An LQ value of more than 1 means the employment of an industry is more concentrated in that city compared to the national level. The number of regional urban centres with LQ greater than 1 by industry sector in 2011 and 2016 is shown in Figure 34. Over time, if there are more urban centres with an LQ of a given industry greater than 1, it implies this industry is growing in a distributed way, with above average presence in more urban centres in 2016 than 2011.

Conversely if there is a declining number of urban centres with industry LQ greater than 1 for given industries, then that industry is concentrating within fewer regional urban centres. Then the spatial changes in industry (concentration or expansion) from Figure 34 are summarised below (Table 11). The data does not indicate industry growth or decline; instead, it indicates the distribution across regional urban centres. Therefore, it is important to consider these data in conjunction with the analysis of industry dynamics in section 3.3.

Figure 34: Changing concentration of employment by industry, regional towns, Australia 2011–2016



Source: ABS census data, authors' calculations.

High degrees of industry specialisation can indicate risks and opportunities within regional economies, due to the exposure to wider industry trends, such as the decline in manufacturing (Barton, Denham et al. 2019). Urban centres whose local economy is highly dependent on seasonal or cyclical industries—such as mining or tourism, which are considered less resilient to major economic transitions over time—are also exposed to adverse economic changes. Our analysis identifies the top-10 regional urban centres in Australia, in terms of exhibiting a high level of industry specialisation (Table 10).

Table 10: Top-10 regional urban centres with high level of industry specialisation, 2016

	Urban centre	Location	Industry	Population	Specialisation
1	Moranbah	QLD	Mining	8,334	0.38
2	Nambour	QLD	Agriculture, population service	18,183	0.23
3	Medowie	NSW	Public service (Defence)	8,995	0.21
4	Boyne Island	QLD	Manufacturing (aluminium)	9,552	0.19
5	Airlie Beach	QLD	Tourism	9,334	0.16
6	Sanctuary	QLD	Production	5,703	0.16
7	Mount Isa	NSW	Mining	10,141	0.14
8	Castlemaine	VIC	Manufacturing, population service	18,342	0.13
9	Port Hedland	WA	Mining	9,933	0.13
10	Leopold	VIC	Population service	13,828	0.13

Source: ABS census data, authors' calculations.

The specialisations in population services, observed in places such as Leopold, Nambour or Castlemaine, are likely to be a result of high levels of out-commuting to nearby larger urban centres, or employment associated with regional tourism given the overlap in consumption. Moranbah, Port Hedland and Mt Isa are all exposed to mining-sector fluctuations, while Airlie Beach's dependence on tourism, and Boyne Island and Castlemaine's specialisations in manufacturing may be risks should the industries these towns are dependent on decline or close.

Table 11: Spatial concentration and expansion of industry specialisation

Spatial concentration	Spatial expansion	Minor spatial change
• Financial services	• Construction	• Agriculture
• Mining	• Administration and support	• Education
• Art	• Wholesale	• Warehousing
	• Manufacturing	• Health
	• Hospitality	• ICT
	• Other services	• Professional service
	• Retail	• Public service

** Measured by the increase or decline in number of urban centres that specialise in a certain industry.*

Source: Authors, based on ABS census data.

The data in Table 11 implies that knowledge-based sectors such as finance, and arts are concentrated in fewer regional urban centres, indicating the productivity benefits associated with agglomeration in these sectors, as well as the capacity to service wide market areas through telecommunications. However, the concentration of mining employment may be a result of the previously mentioned transition from construction to operation, or the growing trend in remote control and automated machinery. Conversely, there is an increasing distribution in sectors that respond to population growth—for example, retail, construction and hospitality. This can be seen as a result of the population growth of the majority of the urban centres included in the scope of this research.

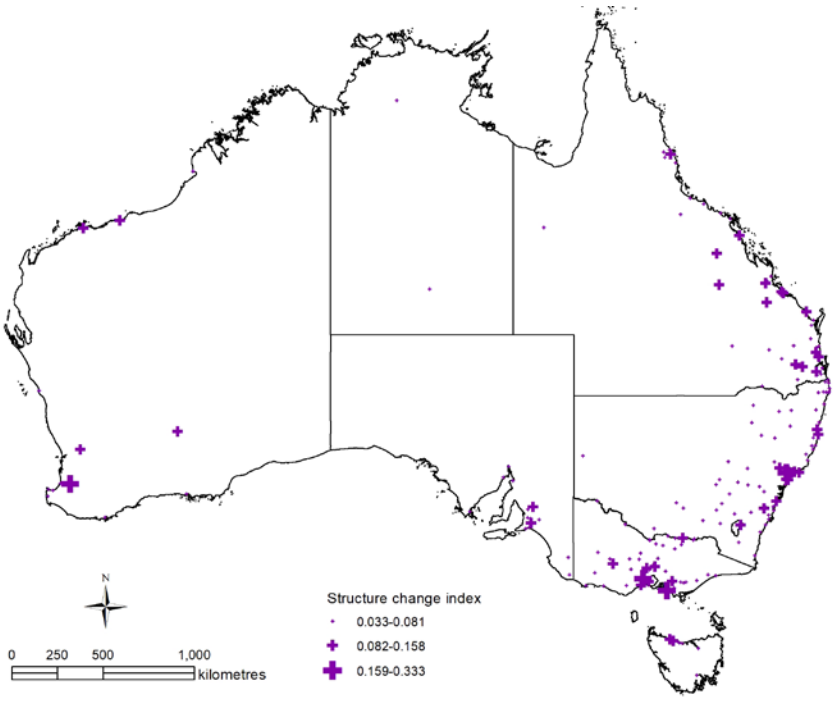
Manufacturing became more dispersed over the period of analysis, a likely result of the closure or winding down of large regional factories, which reduced the level of concentration in the industry—for example, car manufacturer Ford in Geelong and the steelworks in Wollongong.

In addition to spatial change in industry specialisation, we have also calculated and visualised the industry structure change between 2011 and 2016 for regional urban centres (Figure 35 and Figure 36). It measures the overall change in the share of employment of each industry in a regional economy over a five-year period (see the formula in Table 13). This analysis shows that in most states (VIC, NSW, SA, WA) regional urban centres near to a capital city experienced a higher level of change in local industry composition, compared to those in more remote regions. The high level of industry structure change can be considered as arising from:

- the decline in manufacturing, which was central to the growth of many of these regional urban centres during the 20th century (Rich 1987)
- the economic spillover effect of a large nearby metropolitan economy
- the evolving position and function of nearby regional urban centres as they become more integrated within a wider regional economic agglomeration.

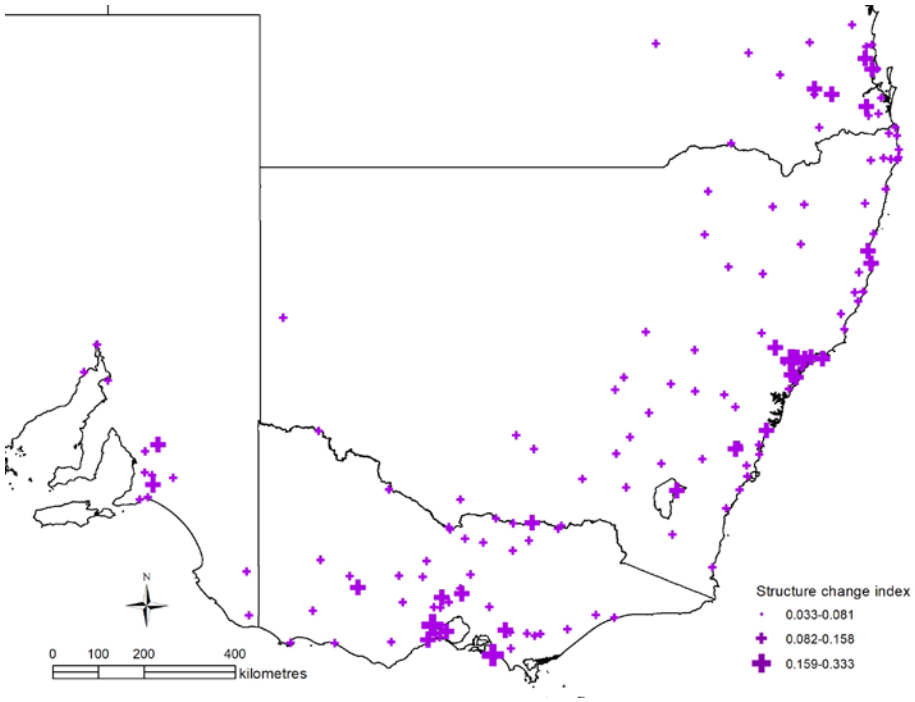
This pattern can be observed for Sydney, where knowledge-based industries and businesses are expanding on the northern coast, and in Newcastle, or in the transition of Geelong from an industrial port base to more advanced manufacturing, design, education and health administration in the context of the wider Melbourne regional structure. The final component of this study incorporates the factors of industry specialisation and industry structural change into an econometric model to assess their impact on the employment growth in regional urban centres and variations.

Figure 35: Industry structure change in regional urban centres, Australia, 2011–2016



Source: ABS census data, authors' calculations.

Figure 36: Industry structure change in regional urban centres, south-east Australia, 2011–2016.



Source: ABS census data, authors' calculations.

3.3.6 Regional-metropolitan interactions

There is an increasing economic connection between regional urban centres and capital cities in Australia, termed 'metro-bound commuting' (Denham 2017). This relationship is established by either:

- metropolitan workers shifting their residence to a regional location while retaining metropolitan-based employment, or
- regional residents accessing employment within the nearby metropolitan area.

Metro-bound commuting can be seen as spillover counterurbanisation, or metropolitan expansion at low densities through satellite settlements, and is indicative of a process of metropolitan expansion, as discussed in Section 2. This shift in residence is considered to be influenced by:

- the rising housing costs in metropolitan areas
- lifestyle and amenity preferences, including in response to metropolitan congestion
- transport infrastructure investment between regional urban centres and major cities that has reduced commuting times
- workplace flexibility, including more frequent working from home
- the higher pay and greater diversity of employment on offer in the major cities, with few comparable positions on offer in the regions for some metro-bound commuters (Denham 2017).

The increasing transport connectivity and metro-bound commuting between regional urban centres and major cities has been addressed in recent regional economic literature, particularly noting that higher metropolitan incomes have regional expenditure effects (Lavesson 2016; Parr 2014).

While the literature has addressed the importance of this relationship—including its impact on housing markets—empirical studies have yet to systematically examine the economic impact of this dynamic on Australia's regional urban centres. In this research, we seek to estimate the degree of regional–metro interaction using journey to work (JTW) data. We measure this relationship by calculating the proportion of residents who live in a regional urban centre and work in a capital city via metro-bound commuting. The results show that metro-bound commuting in 2016 was extensive both in terms of the number of regional urban centres that were home to metropolitan workers, as well as a portion of the regional workforce (Table 12). This is particularly the case given most commuters reside within 150 kilometres of the major cities, as indicated in figures 37, 38 and 39.

Table 12: Summary of metro-bound commuting in regional urban centres, 2016

Number of urban centres with metro-bound commuting	Total metro-bound commuters	Share in total regional workers	Maximum metro-bound commuters
195	207,416	8.9%	25,514

Source: ABS census data, authors' calculations.

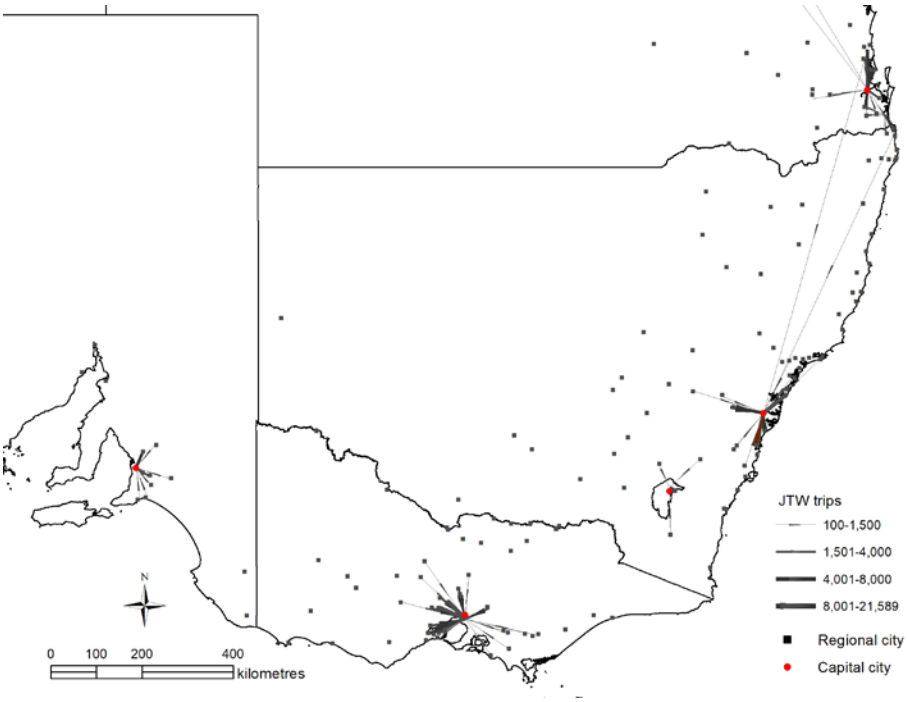
The patterns of metro-bound commuting between regional urban centres and capital cities in Australia are presented in Figure 37 (2011) and Figure 38 (2016), focussing on Adelaide, Melbourne, Sydney and Brisbane. These patterns offer evidence that the extent of metro-bound commuting is increasing over time, both in terms of volume of commuters and in terms of the number of regional urban centres with commuting interactions with nearby capital cities. Also, the proportion of residents in regional urban centres commuting to work in capital cities is increasing over time, from 7.5 per cent of work trips in 2011 to 8.9 per cent in 2016. This pattern appears to be a reflection of the dynamics previously reported by Denham (2021), namely metro-to-regional migration for housing affordability and lifestyle reasons, combined with the continued relative buoyancy and scale of metropolitan labour markets.

Notable patterns include the appreciable expansion of the Melbourne metropolitan commutershed to incorporate a greater number of workers from regional urban centres during 2011–2016, particularly to the coastal zone south of Geelong. More longer-distance trips to Melbourne from regional urban centres are also evident in 2016. Sydney also exhibited intensifying commuting interaction with proximate regional urban centres to the north, west and south of the metropolitan area. Notable for Sydney is the intensifying interaction with Goulburn, near the midpoint between Sydney and Canberra, despite being approximately two hours travel time away from central Sydney by ground transport. The volume of long-distance commuting between Sydney and Brisbane and other regional urban centres suggests that the era of cheap airfares has enabled longer-distance commuting patterns.

In addition to regional flows, there are some very long commutes in 2016 that may not represent regular daily commuting as recorded by the census JTW question, but still indicate the increasing extent of economic connection between urban centres in terms of work travel. As this report was prepared after work-related travel was limited by COVID-19 restrictions, it remains uncertain whether the pattern of regional commuting observed in 2016 will persist in the post-COVID-19 era. While some cities and regions remained under strict restriction at the time of the 2021 Census, other cities and regions were not so affected, thus offering potential for comparative analysis.

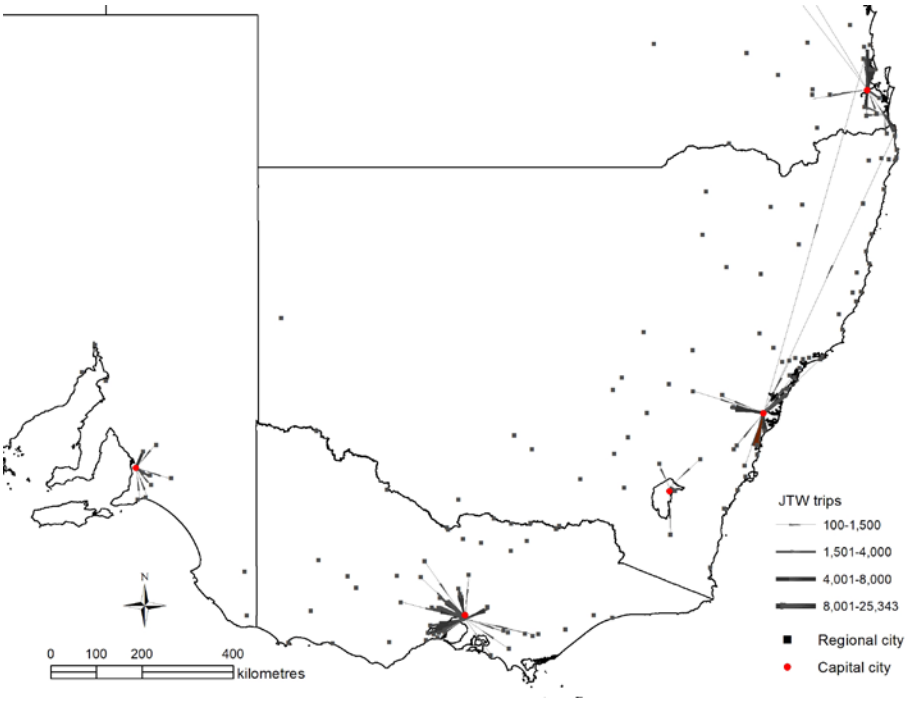
In the case of the Perth metropolitan area (Figure 39), regional commuting patterns can be observed linking the city with Albany, Bunbury, Busselton, Yallingup and Dunsborough, as well as the very remote mining localities of Geraldton, Karratha, Port Hedland and Kalgoorlie. Commuting to these latter locations is likely to be by aeroplane, rather than land-based transport, given the extreme distances involved.

Figure 37: Commuting flows >100 movements, regional urban centres to capital cities, south-east Australia, 2011



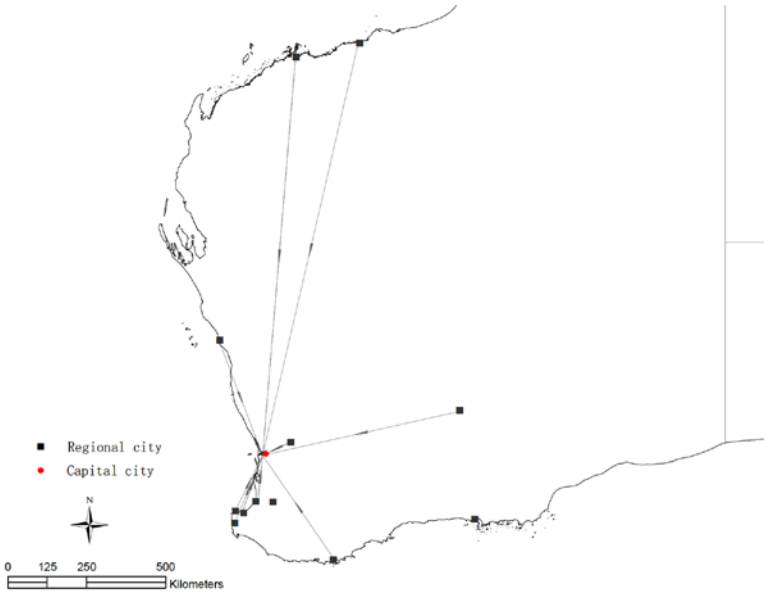
Source: ABS census data, authors' calculations.

Figure 38: Commuting flows >100 movements, regional urban centres to major capital cities, south-east Australia, 2016



Source: ABS census data, authors' calculations.

Figure 39: Commuting flows >100 movements, regional urban centres to major capital cities, west Australia, 2016



Source: ABS census data, authors' calculations.

3.4 Regional economic performance factors

This section assesses regional economic performance within a comprehensive analysis of regional growth, using a structural equation model (SEM) as well as the FERs constructed in subsection 3.3.3. The approach is informed by previous investigations into endogenous regional economic growth undertaken by Stimson, Robson et al. (2009) and Beer, Akshay et al. (2010). The SEM uses 30 economic and demographic variables to measure the endogenous characteristics of regional urban centres that may affect employment growth. These variables were chosen to describe each regional urban centre over four dimensions:

1. Economic and industry composition.
2. Social and demographic characteristics.
3. Housing and infrastructure characteristics.
4. Geography and spatial connectivity.

The theoretical foundation for using these variables has been explained in previous research and regional analysis (see Stimson et al. 2010). The analysis undertaken for this report incorporates additional new variables, which are considered potentially important factors in attracting new residents. These additional variables are as follows:

- Regional economic scale, measured by jobs in the FER.
- Rate of jobs growth in the FER.
- Share of self-employed workers.
- Net skilled migration to the regional urban centre.
- Proportion of residents in a regional urban centre commuting to work in a capital city.

The addition of the FER employment measures reflects the changes to the economic catchment of the urban centres. The share of self-employed workers provides indication of the economic structure. Net skilled migration indicates increasing human capital within the urban centre, while commuting indicates the influence of metropolitan interactions on regional growth.

The full set of variables and their units used to model regional employment growth are summarised in Table 13.

3.4.1 Path analysis

The dependent variable for the SEM is the employment growth in a regional urban centre between 2011 and 2016. That is, the model uses the interaction of the other (independent) variables to analyse their influence on employment growth. The modelling of employment growth operates two sub-models simultaneously: the structural model and the measurement model.

First, the structural model consisting of seven explanatory factors is established: *employment*, *income*, *industry*, *structure*, *human capital*, *population change* and *housing market*. Each factor serves as a latent variable that is hypothesised to explain local employment growth. Then in the measurement models, each latent variable is described by the constituent observed variables.

Table 13: Variables for economic performance analysis of regional urban centres

Dimension	Variable	Measurement
Economic	Local economic scale	Number of jobs in a regional urban centre, 2011, by place of work
	Local economic growth	Job growth rate in a regional urban centre, 2011–2016 (dependent variable)
	Regional economic scale*	Number of jobs in the belonging FER, 2011, by place of work
	Regional economic growth*	Job growth rate in the belonging FER, 2011–2016
	Worker income level	Average worker weekly income, 2011, by place of work (AU$)
	Worker income growth	Change in worker weekly income, 2011–2016, by place of work (AU$)
	Share of lifestyle work	Total share of retail, hospitality, personal service and art jobs, 2011 (%)
	Share of production work	Total share of manufacturing, wholesale, warehousing, transport jobs, 2011 (%)
	Share of construction work	Total share of construction jobs, 2011 (%)
	Share of government work	Total share of jobs associated with local, state and federal governments, 2011 (%)
	Share of institution work	Total share of education, health and community service jobs, 2011 (%)
	Share of resource work	Total share of agriculture, mining and energy resources jobs, 2011 (%)
	Share of self-employed*	Total share of jobs that are self-employed, 2011 (%)
	Industry specialisation	H index = $\sum_{i=1}^{n} Si^2$, Si- share of industry i, 2011
	Industry structural change	SCI = $0.5\sum_{i=1}^{n}(Si(t) - Si(t-5))$, $Si(t)$ - share of industry i in year t
	Share of large businesses	Share of businesses that have more than 20 employees, 2011 (%)
Demographic	Population size	Population of a regional urban centre, 2011, by place of residence
	Population growth	Population growth in a regional urban centre, 2011–2016
	Share of labour force	Share of local residents between 18 and 65 years old, 2011 (%)
	Share of retired resident	Share of local residents over 65 years old, 2011 (%)
	Share of full-time workers	Share of local residents employed on a full-time basis, 2011 (%)
	Share of professionals	Share of local resident working as a professional or manager, 2011 (%)
	Share of service workers	Share of local residents working in a sales, clerical position, 2011 (%)
	Share of blue-collar workers	Share of local residents working as a blue-collar worker, 2011 (%)
	Share of university education	Share of local residents with a university qualification, 2011 (%)
	Net employed migrants*	Net employed migrants in a regional urban centre, 2011–2016 (%)
	Personal income	Average personal weekly income, 2016, by place of residence (AU$)

Dimension	Variable	Measurement
Housing	Housing density	Number of dwellings per hectare, 2011
	Housing price	Average housing sale price in 2016, all dwelling types (AU$)
	Housing ownership rate	Proportion of dwellings owned outright or being purchased, 2011 (%)
	Housing turnover rate	Proportion of dwellings that were in transaction in housing market, 2011 (%)
	Housing rent	Average housing weekly rent, all dwelling types, 2011 (AU$)
Geography and connectivity	Coastal city	City is adjacent to the coast, yes=1, no=0
	Distance to the capital city	Distance of a regional city to the nearest capital city (km)
	Distance to the nearest city	Distance of a regional city to the nearest regional city (km)
	Residents work in capital city*	Proportion of residents in a regional city commuting to work in a capital city (%), 2016

*Note: * New variables added to regional analysis; AU$ = Australian dollars.*

Source: Authors.

3.4.2 Model results

The estimation of the factors and their measurement variables (observed variables) produced by the SEM are summarised in Table 14. One advantage of using the SEM model is that it identifies the relationships between the various explanatory factors and the target variable, employment growth, and the relationships between the explanatory factors. Therefore, some factors that directly affect employment growth may also have an indirect effect through other factors that employment growth is associated with. The total effect of a factor is the sum of its direct effect and indirect effect.

Table 14: Estimation of the structural model

Factor		Direct effect	Indirect effect	Total effect
Employment	**F1**	0.123	−0.05	0.073
Income	**F2**	−0.403	–	−0.403
Industry	**F3**	0.073	0.206	0.279
Structure	**F4**	0.137	–	0.137
Housing market	**F5**	0.265	–	0.265
Population change	**F6**	0.571	0.141	0.712
Human capital	**F7**	0.339	0.033	0.371
Location and connectivity	**F8**	0.066	0.171	0.237

Source: Authors, based on ABS census data.

The standardised coefficients of the factors used are listed in Table 15. The effect of each factor was standardised with the mean of 0 and standard deviation of 1. The value of the coefficient denotes that every unit (standard deviation) change in the latent variable will result in one unit (standard deviation) change in the local employment growth.

Table 15: Estimation of the measurement models

Factor	Observed variables	Loading
Employment	UCL job, 2011	0.174
F1	UCL job change, 2011–16	0.759
	* FER job, 2011	0.574
	* FER job change, 2011–16	0.636
Income	Worker income, 2011	0.999
F2	Worker income change, 2011–16	0.108
Industry	Lifestyle work (%)	0.776
F3	Production work	−0.441
	Construction work (%)	0.62
	Government work (%)	−0.544
	Institution work (%)	0.058
	Resources work (%)	−0.387
	Self-employed work (%)	0.799
Structure	Industry specialisation	0.179
F4	Industry structure change, 2011–16	0.081
	Large business (%)	0.818
	* Residents work in capital urban centre (%)	−0.719
Housing market	Housing density	0.451
F5	Housing ownership rate	0.507
	Housing price	0.899
	Market turnover rate	0.355
	Housing rent	0.887
Population change	Population, 2016	0.159
F6	* Net skilled migration, 2011–16	0.99
Human capital	Labour force	0.828
F7	Retired	−0.885
	Full-time worker	0.493
	Professional worker	−0.217
	Service worker	−0.552
	Blue-collar worker	0.493
	University education	−0.167
	Personal income	0.812
Location and connectivity	Distance to the capital urban centre	−0.836
F8	Distance to the neighbouring urban centre	−0.853
	Coastal urban centre	−0.15

*Note: * = new variables added to regional analysis.*

Source: Authors, based on ABS census data.

3.4.3 Discussion of growth factors

The following subsections discuss the effects of each factor (latent variable) on regional urban centre employment growth, as well as the significance of measurement variables of each factor.

Employment factor

The employment factor is positively correlated with employment growth in regional urban centres. However, in the context of regional employment growth, such effect is not very strong (0.123). The effect of local employment participation (0.759) is higher than the scale of employment (0.174). In addition to the local employment effect for a regional urban centre, the performance of other urban centres it interacts with—within a FER—has an important effect on the local employment growth. The employment connection with capital cities presents a slightly negative outcome on local job growth, which is explained below in the discussion of location and connectivity factors.

Industry factor

The employment change in regional urban centres is also indicated by the industry factor. The analysis captured distinct industry effects on job growth in regional urban centres between 2011 and 2016. Urban centres with a high proportion of lifestyle jobs, construction jobs and self-employed businesses experienced strong employment growth. Urban centres whose economy is government-led or highly dependent on the resources and production sectors experienced employment decline.

However, overall the model shows that at a national level the industry factor does not exert a strong effect on employment growth in regional urban centres (0.073). This outcome was also found by Stimson, Robson et al. (2009), and may be caused by significant variation in such relationships between states in Australia, as well as the variation in the performance of subsectors as discussed in subsection 3.3.2.

Structure factor

The structure factor provides more explicit measure of industry composition and economic change in regional urban centres, measured by *industry specialisation* and *structural change* and the share of large businesses. However, these do not appear to have a strong effect on local employment growth (0.137). This finding is partly in line with previous findings produced by Stimson, Robson et al. (2009), who suggest that a high industry specialisation may make a city less resilient in response to national or global economic changes. The question of varying outcome of industry specialisation and diversification on employment growth remains unsettled. Beer, Akshay et al. (2020) find that the type of industry specialisation and the size of a city present an important effect, thus contrasting with Stimson, Robson et al. (2009) and the present research.

Income factor

The worker income factor appears to have an overall negative relationship with employment growth among regional urban centres between 2011 and 2016. This finding diverges from previous studies, where *worker income* was not identified as a factor in regional urban centre growth (Stimson et al. 2009). However, there are three reasons we propose for this outcome.

1. Employment growth in many regional urban centres is dominated by lower-income industries such as personal services, accommodation and hospitality. These industries employ relatively high numbers of part-time and casual workers, often on modest incomes—which reduces average income despite total employment growth.
2. Growth in health and education sectors has been rapid, but health as an overall sector includes many lower-paid jobs, such as in aged-care and social assistance (Toner et al. 2019).
3. There has been a decline in employment in mining, which is associated with high incomes.

This negative relationship between *worker income* and employment growth in regional urban centres suggests that future regional policy needs to enable the development of industries that support higher wages and productivity—not just employment growth per se—if a stronger regional economy is desired. However, that task is not straightforward, as higher wages tend to be associated with higher-value industry sectors, which are not driven by population growth.

Population and human capital factor

Population-related factors—including human capital, population change and housing markets—were found to have a strong relationship to employment change in regional urban centres. The factor that presents the highest positive impact on regional employment growth is *population change* (0.571). This outcome indicates that employment growth in regional urban centres was highly dependent on population growth and demand for housing and services. However, as discussed previously, causation is bidirectional and complex for housing and employment (e.g. Trendle 2009).

In addition to population growth, *human capital* is strongly associated with employment growth in regional urban centres (0.339). In particular, urban centres with a high proportion of blue-collar workers, full-time workers, and higher personal income overall experienced employment increases. Conversely, employment growth in regional urban centres with a higher proportion of retired residents is comparatively lower than those with lower proportions of such residents. The results also show that job growth is relatively low in urban centres with a higher proportion of professionals or residents with university qualifications. As these attributes are also often associated with metro -bound commuting, employment growth may be lower, even with expenditure effects taken into account, as population growth is not associated with increased local employment.

Housing-market factors

The *housing-market* factors were included in the SEM because, in orthodox considerations of regional growth, the housing market responds to employment and amenity-related demand (e.g. Glaeser 2008). The results show the housing-market factor is highly positively associated with population change in regional urban centres (0.609). The expanding housing market, in terms of increase in the level of housing stock, housing prices, ownership and the market turnover rate, positively correlates with local employment growth (0.265). This relationship between population growth and housing-market factors is not unexpected, but increasing housing costs are not necessarily desirable for regional urban centres, particularly if they are not accompanied by wages growth (Costello 2007; Denham 2021). This could be a consequence of retirement-based population growth in which wealth substitutes for income, thus artificially inflating the relative significance of low-wage population-based service employment.

Location and connectivity factors

In contrast to the findings from the major regional economic literature, our result shows that the degree of remoteness of regional urban centres in aggregate has a limited direct effect on local employment growth (0.066). This finding accords with previous research, which found the effect of the location of regional urban centres on economic growth varied across the states of Australia (Stimson, Robson et al. 2009). However, we found that the location of a regional urban centre influences local employment growth through an indirect effect mediated by human capital changes: the strong correlation (0.454) between location/geography and accumulation of human capital in a centre has a positive effect on employment growth.

3.5 Policy implications

The analysis of employment dynamics in regional urban centres provides further evidence of the overall conclusions of this section, including the trend towards larger regional cities growing faster, and also proximity to major cities being a factor. In addition to supporting those conclusions, the analysis of employment trends in regional urban centres between 2011 and 2016 indicates that there has been an overall shift from export-oriented employment in sectors such as mining, manufacturing and agriculture to employment generated by meeting the needs of local populations. Changes in consumer preferences—such as regional tourism and increased hospitality expenditure —along with the increasing demands for healthcare by ageing populations, appear to have been vital in sustaining regional employment markets in recent years.

While there is strong evidence of concentration of regional population and employment in the larger regional cities, the population and employment disparities between the largest and second-largest cities remain substantial in each of Australia's states and territories. The declining share of regional urban-centre employment in financial services and professional services and ICT is a concern, as these knowledge-based sectors are the sources of high wages and productivity in contemporary economies. These sectors benefit the most from the dense interactions that typify metropolitan CBD workplaces, and are central to the productivity gains from agglomeration economies (Scott 2017).

Policy makers should focus on fostering these high-productivity sectors within the larger and growing regional urban centres, but there is also a need to address the circumstances of the many regional urban centres that are experiencing downturns. The mining employment boom was principally a construction boom, and there are diminishing jobs in ongoing mining operations. Agricultural communities have declined over recent decades as workers and farming families have been displaced by larger farms and higher capacity machinery in order to be globally competitive. The decade-old notion of Australia's patchwork economy still holds—although the brighter colours seem to be more concentrated in the metropolitan peripheries.

The analysis in this section also points to a disconnect between the policy discussions about regional economies and trends in regional employment. While there is a focus on major regional projects—for example, inland rail, and the impact of net zero carbon transition policies on inland economic activity such as carbon-intensive agriculture and mining—the data presented in this report suggest that regional jobs are increasingly likely to be found in healthcare and social assistance, retail trade and education, and in coastal locations. There is an argument that the purpose of some regional urban centres would diminish without the regional exports of mining and agriculture, along with the population-oriented employment growth sectors listed above. In turn, this implies the need to distinguish between production and employment in debates about appropriate policies for regional development in Australia. This applies particularly in mining, as automation and remote work reduce regional employment, while the benefits are realised in metropolitan head offices.

The structural equation model that assessed factors in regional economic growth provides further insights into policy for regional development in Australia. The causality in the relationships between population growth and employment runs in both directions, which is particularly the case for population-based employment growth sectors, such as retail trade, hospitality and personal services. As with a recent study by Beer, Akshay et al. (2020), the relationship between specialisation and regional growth is not entirely clear, and is complex to disentangle. Also, it is not apparent whether intervening to change the composition of regional economies would be effective, as changes need to respond to local conditions and resources.

An outcome from the SEM with clear policy implications is that population growth is associated with reduced average wages. Arguments that growth in regional populations leads to better economic outcomes and employment opportunities are fundamental to proposals for regional faster rail and commentary that regarded a regional revival as a response to COVID-19 during 2020.

However, these results suggest further interventions need to support deeper economic development outcomes: the implication is that the jobs created are of low pay, and also in sectors associated with part-time work such as retail and hospitality. This result extends the policy implications from Section 2, that peri-urban population redistribution may be considered as metropolitan expansion due to these employment effects, and as Hall and Paine (2012) caution, the redistribution of population without economic functions, particularly employment growth that is ideally high-skill and high-wage, is inefficient due to increased commuting lengths. In terms of the causality between employment and population growth: these outcomes from the SEM suggest that good jobs attract people, but people alone only attract poor jobs.

4. Regional typologies

This final analytical section provides a typology of regional urban centres in Australia. Hierarchical clustering analysis of the 198 urban centres included in the research sample provided nine clusters:

- Cluster 1: Metro-satellites (26 regional urban centres)—Metropolitan proximity and high levels of metro-bound commuters and university-educated residents.
- Cluster 2: Large regional cities (5)—The largest regional cities, most close to state capitals and with balanced economic structures.
- Cluster 3: Medium growth centres (25)—Their employment structure, ageing populations and location on the coast or Murray River indicate urban centres growing as a result of amenity and retirement migration.
- Cluster 4: Regional service centres (63)—The largest cluster, near average across all variables and widely distributed.
- Cluster 5: Ageing population centres (9)—Located on the north coast of New South Wales, and the north of Tasmania, these urban centres share ageing population, low employment growth, and a high proportion of lifestyle workers.
- Cluster 6: Agricultural centres (23)—High rates of resources employment, their location and the higher rates of self-employed workers indicate agricultural centres. Located across the south and east of Australia
- Cluster 7: Mining centres (9)—Remote mining cities with high levels of resources employment, high incomes and low growth in jobs.

- **Cluster 8: Industrial centres (28)—High rates of production-based employment, with indication of decline in the low rate of in-migration. Evenly distributed across the south and east of mainland Australia.**

- **Cluster 9: Northern Queensland (10)—This cluster includes urban centres in the north of Queensland, on average more than 1,000 kilometres from Brisbane and share a high proportion of government employment, particularly Defence.**

The clustering process underscores the variegated nature of Australia's regional urban centres and their FERs.

In this section, the results of the previous analyses are used to develop a typology of regional Australian settlements based on their:

- economic profile
- population trajectory
- industry structure.

In combining population and economic trends, the clustering provides a consolidation of the previous analyses, and underscore the trends in and policy implications for regional urban centres. Understanding the difference between urban centres is valuable, as it helps identify key regional processes that are important for strategic planning and policymaking.

To enhance the understanding of regional urban centres in Australia, we adopt a hierarchical cluster analysis to classify regional urban centres into distinct groups, with each group representing urban centres of a certain type with similar social and economic and geographical characteristics. To analyse the differences between regional urban centres, 17 variables are used in the cluster analysis (Table 16). The selection of variables is based on regional economic literature and economic models used to analyse regional performance (Stimson 2001).

4.1 Analysing regional clusters

As this project is focussed on the economic performance of regional urban centres, 11 variables are used to describe the economic characteristics of regional urban centres, such as scale of economy, industry composition and worker income, as used in the SEM in Section 3.4. To understand how the demographic and geographic characteristics of an urban centre are important to local economy, a further six variables are included. We include the share of retired residents, residents with university education, and net migration in local population, and three variables to describe the location and connectivity of regional urban centres in Australia.

The hierarchical clustering method is used to group regional urban centres based on the analysis of variables. The procedure is as follows.

1. At the beginning, each regional urban centre is placed in a separate, single-urban centre cluster.
2. The two clusters closest together in terms of their variables are combined into a new cluster. The Ward (1963) method was used to determine closeness, which uses the weighted squared distance between cluster centres determined by the average of variables within the cluster. The objective is to generate clusters in which the variance between their members is minimised.
3. The process is then repeated with the new set of clusters, until no urban centre is located in more than one cluster (see Stimson et al. 2001).

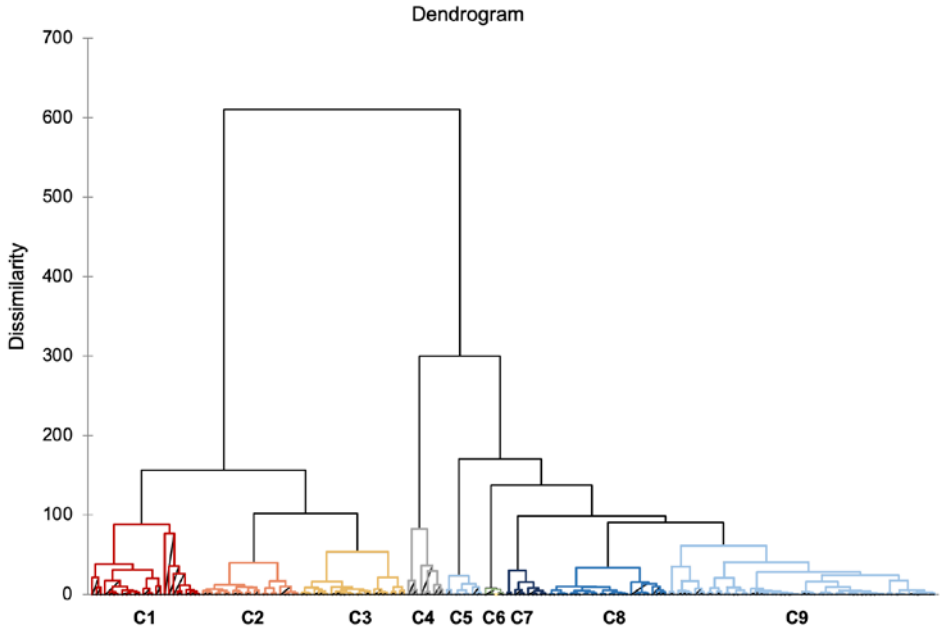
This process is depicted via a dendrogram (Figure 40), starting with each urban centre placed along the bottom axis, working upwards to end in a single cluster. The clustering process does not suggest the optimal number of clusters, therefore six outputs were calculated and assessed, with the number of clusters ranging from 5 to 11. Models that produced too many or too few cities within a cluster were excluded, to make sure the result is meaningful and effective to interpret the outcome. In the end, nine regional urban-centre clusters were identified, based on the assessment of urban centres assigned in each cluster and the interpretability of the clusters.

Table 16: Population cluster variables

Economy	Total jobs 2016	Number of jobs in a regional urban centre, 2016, by place of work
	Job growth rate 2011–16	Job growth rate in a regional urban centre, 2011–2016
	Job growth rate in FER 11–16*	Job growth rate in the belonging FER, 2011–2016
	Worker income	Average worker weekly income, 2016, by place of work (AU$)
	Self-employed*	Total share of jobs that are self-employed, 2016 (%)
	Large businesses*	Share of businesses that have more than 20 employees, 2016 (%)
	Government jobs	Total share of jobs associated with local, state and federal governments, 2016 (%)
	Production employment	Total share of manufacturing, wholesale, warehousing, transport jobs, 2016 (%)
	Lifestyle employment	Total share of retail, hospitality, personal service and art jobs, 2016 (%)
	Resource employment	Total share of agriculture, mining and energy resources jobs, 2016 (%)
	Construction jobs	Total share of construction jobs, 2016 (%)
Geography	Distance to capital urban centre	Distance of a regional urban centre to the nearest capital city (km)
	JTW to capital city*	Proportion of local workers commuting to work in a capital city
	Distance to the neighbouring town*	Distance of a regional urban centre to the nearest regional urban centre (km)
Demography	Retired residents	Share of local residents over 65 years old, 2016 (%)
	University education	Share of local residents with university qualifications, 2016 (%)
	Net migration 2011–16*	Net migration to a regional urban centre, 2011–2016 (%)

Source: Authors.

Figure 40: Hierarchical cluster analysis, regional urban centres, Australia, 2016.

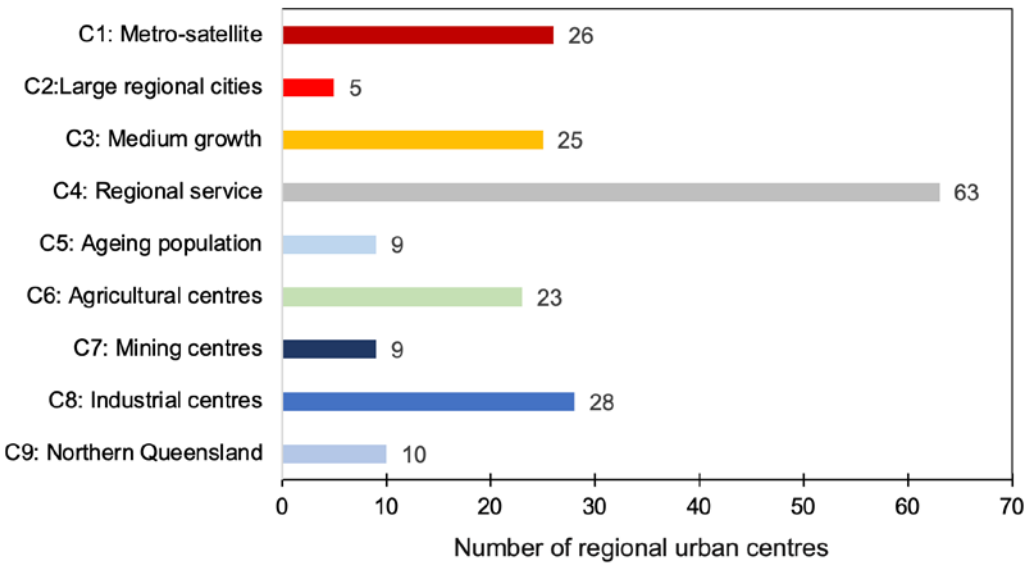


Source: Authors, based on ABS census data.

4.2 Results

Based on the distinguishing variables included in the hierarchical clustering, each of the nine clusters was named, with the distributions depicted in the histogram in Figure 41. The colour coding aligns with the dendrogram depicted in Figure 40.

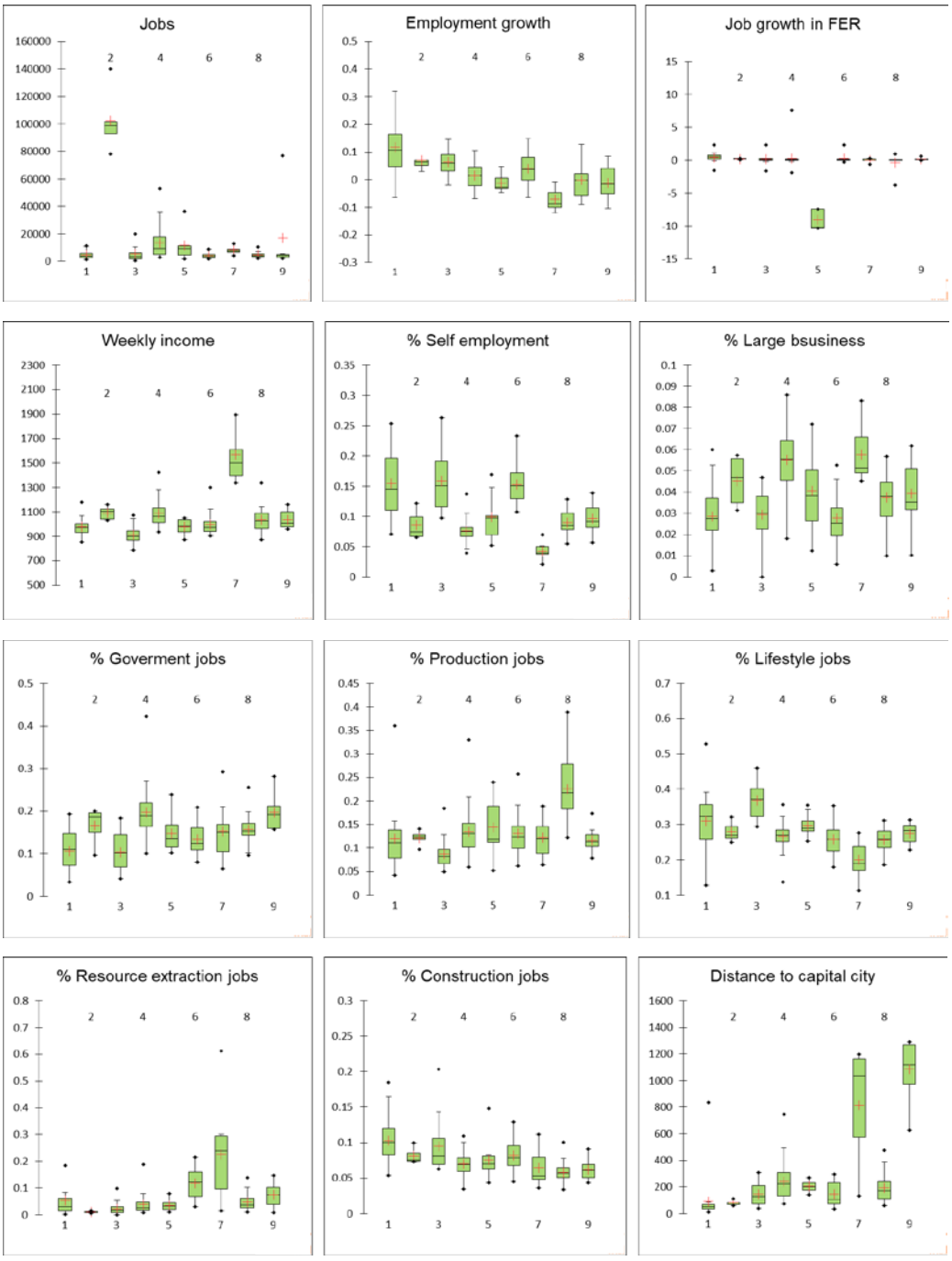
Figure 41: Histogram of regional urban centre clusters



Source: Authors, based on ABS census data.

The distribution of the variables across the nine clusters is depicted in the 'box and whisker' diagrams in Figure 42, depicting the average, variance and minimum and maximum values for each variable across each cluster. For example, the plot of jobs shows that *Cluster 2: Large regional cities* is especially distinguished by the number of jobs, which also indicates population scale. *Cluster 5: Ageing population* has noticeably lower jobs growth within its FERs and the second-highest retirement variable after *Cluster 3: Medium growth.* The distinguishing features of each cluster are discussed further in subsection 4.2.1.

Figure 42: Distribution of variables by hierarchical cluster



Source: Authors, based on ABS census data.

4.2.1 Cluster attributes

The purpose of undertaking cluster analysis is to identify characteristics of regional urban centres that underpin the categorisations. Therefore, the insights from clustering are obtained by considering the variables that distinguish each cluster, either positive or negative. Table 17 provides the mean of each variable for the nine clusters.

In addition to the variables, the spatial distribution of clusters of regional urban centres is depicted in Figure 43 and Figure 44. The mapping of the clusters indicates that some are widely distributed, particularly in the more densely populated southern and eastern Australia, while others are concentrated in regions, or share geographic similarities:

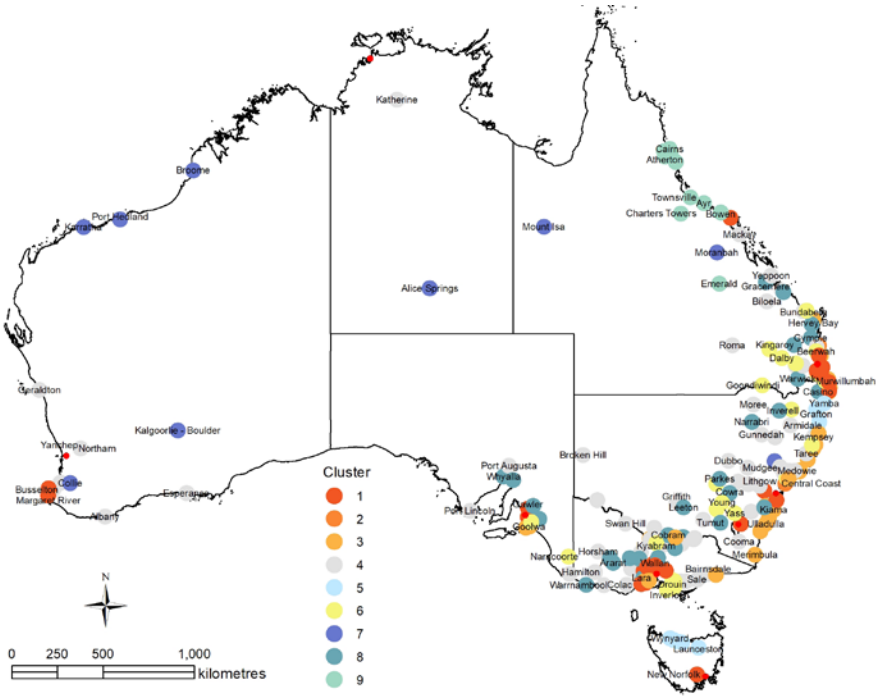
- Clusters 1 and 2 are generally located near the state capitals.
- Cluster 3 is either coastal or on the Murray River.
- Cluster 4 is widely distributed.
- Cluster 5 is in two locations: northern coast of NSW, and in the north of Tasmania.
- Cluster 6 is in the south-east of the mainland.
- Cluster 7 is largely comprised of remote locations.
- Cluster 8 is in the south-east of the mainland.
- Cluster 9 is in the north of Queensland.

Table 17: Mean variables for regional urban-centre clusters

Variable	C1	C2	C3	C4	C5	C6	C7	C8	C9
Total jobs, 2011	4,754	102,276	5,423	13,335	11,722	4,090	8,221	4,700	17,098
Job growth rate, 2011–2016	0.12	0.07	0.06	0.01	−0.01	0.04	-0.07	0.00	−0.01
Job growth rate in FER, 2011–2016	0.42	0.18	0.16	0.24	−9.04	0.24	0.01	−0.31	0.19
Worker weekly income ($), 2016	979.7	1091.9	915.4	1087.6	978.1	997.5	1566.0	1033.6	1036.3
Share of jobs are self-employed, 2016	0.15	0.09	0.16	0.08	0.10	0.15	0.04	0.09	0.10
Share of large businesses in the local economy, 2016	0.03	0.05	0.03	0.06	0.04	0.03	0.06	0.04	0.04
Share of government jobs in the local economy, 2016	0.11	0.17	0.10	0.20	0.15	0.13	0.15	0.16	0.20
Share of production jobs in the local economy, 2016	0.12	0.12	0.09	0.13	0.14	0.13	0.12	0.23	0.12
Share of lifestyle jobs in the local economy, 2016	0.31	0.28	0.37	0.27	0.30	0.26	0.20	0.26	0.28
Share of agriculture/mining jobs in the local economy, 2016	0.05	0.01	0.02	0.04	0.03	0.12	0.23	0.05	0.07
Share of construction jobs in the local economy, 2016	0.10	0.08	0.10	0.07	0.08	0.08	0.06	0.06	0.06
Distance to the nearest capital city (km)	89.7	79.6	145.5	240.1	204.4	144.3	813.7	194.8	1,083.3
Distance to the nearest regional city (km)	20.6	21.9	21.4	70.0	34.6	34.4	290.6	42.1	58.9
Proportion of workers commuting to capital cities, 2016	0.39	0.10	0.07	0.01	0.00	0.08	0.01	0.03	0.00
Proportion of local residents aged >65, 2016	0.16	0.19	0.30	0.18	0.24	0.21	0.07	0.21	0.17
Proportion of residents have university qualification, 2016	0.22	0.15	0.13	0.11	0.12	0.15	0.10	0.09	0.10
Net migration rate between 2011 and 2016	0.09	0.03	0.05	−0.02	0.00	0.02	−0.08	−0.02	−0.03

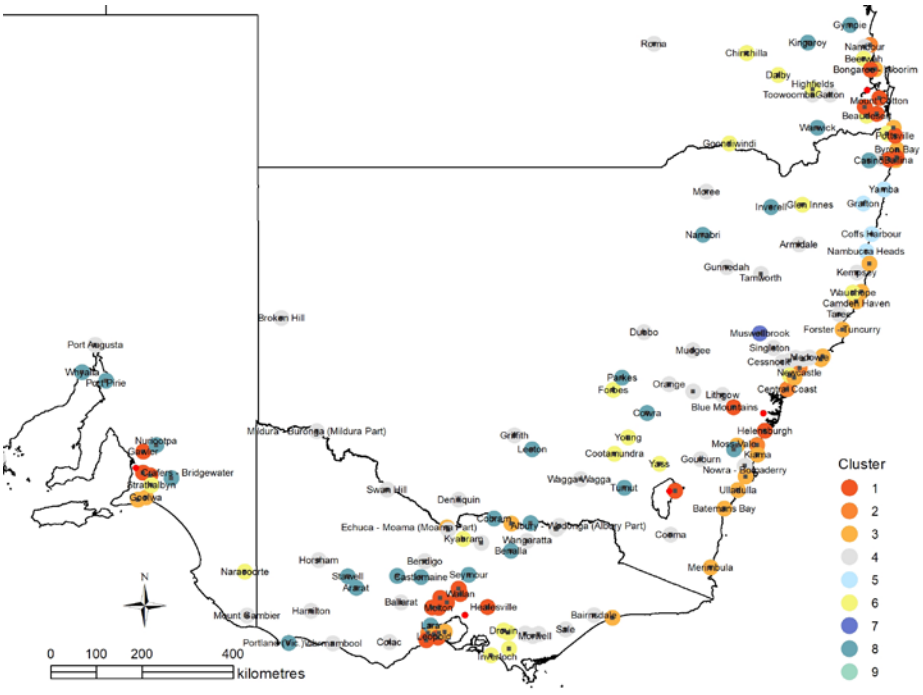
Source: Authors, based on ABS census data.

Figure 43: Distribution of regional clusters, Australia



Source: Authors, based on ABS census data.

Figure 44: Distribution of regional clusters, south-east Australia



Source: Authors, based on ABS census data.

4.3 Description of clusters

This section provides a summary of each cluster, highlighting the aspects of the group or urban centres that are distinct from other clusters.

Cluster 1: Metro-satellites

There are 26 regional urban centres in this cluster, which are distinguished by metropolitan proximity and higher levels of metro-bound commuters and university-educated residents than regional centres overall. The high construction employment and net migration experience of these centres also indicate the outcomes from increasing population. These urban centres also have the highest average rate of employment growth of the nine clusters, but with high variance and difference between the maximum and minimum.

Higher levels of education attainment have been associated with metro-bound commuters in previous studies (Denham 2018; Lavesson 2016). The higher rate of lifestyle employment can also be contributed to metro-bound commuters, as they have established a clear separation between residential and work location. Proximity to capital cities may also contribute to lifestyle employment, particularly for the high-amenity satellite towns that also have a tourism sector. This higher lifestyle employment may also account for the lower incomes of non-commuters who reside and work within these locations, as retail, hospitality, personal services and arts jobs are typically modestly remunerated.

Cluster 2: Large regional cities

Cluster 2 consists of the five largest regional cities in Australia; these cities also exhibited the highest levels of employment in 2016 by a large margin. The data for the 'Jobs in 2016' variable also indicates that there is an inequitable distribution of size in Australian regional cities, not just between capital cities and regional cities. Note also that these large cities are located near their state capital, and have experienced moderate population and employment growth, as discussed in Section 2.2 and Section 3.2.

The employment variables indicate that these regional cities have balanced economic structures, largely in line with the other clusters. The one exception is strength in construction, which is driven by population growth and the associated demand for housing and infrastructure. With their close proximity to the metropolitan economy, these cities present a high level of interaction with capital cities via metro-bound commuting (10%).

Cluster 3: Medium growth

The 25 settlements in Cluster 3 are associated with higher rates of lifestyle employment and retirement-age residents. These towns and small cities exhibit traits that suggest they are attracting residents due to their livability. They are all located within 400 kilometres of capital cities, with many located closer, and thus there is some commuting to the state capitals. There is also strong employment growth within this cluster, with higher rates of university-educated and self-employed people, which indicates a workforce with a strong human capital endowment.

The lifestyle and retirement appeal of these towns is reinforced by their location: they are all coastal—apart from Cobram and Moama, which are on the Murray River.

Cluster 4: Regional service

Cluster 4 is the largest cluster, with 63 urban centres. The size of the cluster also means that the centres in it are near average in most variables, and are thus broadly representative of regional urban centres in Australia. They have slight tendencies towards large business, government employment and distance to other regional urban centres. They also have a lower proportion of self-employed workers.

These outcomes from the cluster analysis and their distribution across every state in Australia—except Tasmania—indicates that they are regional service hubs, providing a range of public-sector and private-sector services for their regional catchments.

Cluster 5: Ageing population

The nine urban centres in Cluster 5 are concentrated in two locations: the north coast of New South Wales, and in the north of Tasmania. They are characterised by significantly lower employment growth in their encompassing FERs than any other clusters, as well as a slightly higher proportion of retirement-age residents and lifestyle workers. These two areas also shared growing employment within the urban centres, and decline in the associated FER as discussed in subsection 3.3.4. This may be the result of ageing populations moving into the major centres to access health and community services.

The urban centres in this cluster offer similar characteristics to those in Cluster 4, except for lower employment growth and a higher proportion of retired residents in local population. They are also located closer to other regional urban centres.

Cluster 6: Agricultural centres

The 23 urban centres in Cluster 6 share a higher rate of resources employment overall, but their locations and the higher rates of self-employed workers indicate that they are agricultural centres. Cluster 6 centres are predominantly inland, and are located in an arc from Strathalbyn near Adelaide through to Bundaberg in Queensland.

Outside of these observations, this cluster is also highly variable, with large ranges evident in construction, metro-bound commuting, employment growth, self-employed, construction and migration. This indicates that while these settlements share some traits, they are also different in many other aspects.

Cluster 7: Mining centres

Cluster 7 is also resource-dependent, but unlike Cluster 6 consists of urban centres dependent on mining rather than agriculture. The matrix in Figure 42 shows that these urban centres are distinct from the other clusters in many ways that are associated with mining communities. They feature:

- the highest worker income—approximately 50 per cent higher on average than other clusters
- the highest proportion of resources employment
- the most remote locations—on average the furthest distance to both capital city and other regional urban centre
- the least number of retirement-age people—people live there to work, and then leave.

There was also population and employment loss in the urban centres in this cluster.

These outcomes reflect the cyclical nature of mining as an industry, as well as the higher propensity for employment in large businesses. In addition to fluctuating commodity markets, employment in the sector can reduce dramatically as construction projects end, as there are fewer jobs in operations. These issues are further discussed in Section 3.2. Collie is included in this cluster.

Cluster 8: Industrial centres

Manufacturing is still the dominant industry in the 28 urban centres in Cluster 8. These urban centres have low net migration, and they also have a comparatively low level of university-educated residents. In geographical terms, they are evenly distributed across the south and east of mainland Australia. While not evident in these data, the decline in Australian manufacturing since the late 20th century is likely to have affected some of these urban centres. However, others within this cluster are associated with food production and processing, with strong connections to their agricultural hinterlands.

Cluster 9: Northern Queensland

The final cluster comprises 10 towns to the north in Queensland, located on average 1,100 kilometres from the capital city of Brisbane. They are different to Cluster 7 as their local economy includes greater government-sector employment, rather than being resource-dependent. This government employment is due to the defence facilities located within the settlements in this cluster.

4.4 Policy implications

The cluster analysis provides support for the previous conclusions drawn from the population and economic analysis included in this report. It shows a clear pattern that the growing regional urban centres, contained in clusters 1, 2 and 3, are mainly distributed around the capital city of each state (with the exceptions of Darwin and Hobart), and some are along the south-east coast of the nation. Most urban centres located more than 100 kilometres from a capital city were static or experienced a decline in population and employment between 2011 and 2016. These patterns of spatial variation reflect processes and spatial distribution of advantage and disadvantage in regional development in Australia, highlighting the call for policy attention.

The clustering also confirmed the population and economic similarities between the urban centres on the north coast of New South Wales and in northern Tasmania, suggesting there may be some policy and practice benefit in exchanging knowledge and experiences between these urban centres. Other clusters were more expected, such as the resource-intensive urban centres in Cluster 7, which also provides some confidence in the analytical process.

The clustering also underscores that there is not a single regional Australia—although some urban centres share traits and trajectories, there is a high degree of heterogeneity. At its broadest level, the distinction between clusters 1, 2, 3 (and the others noted earlier) could provide the basis for an argument that metropolitan Australia now extends well into adjacent regional hinterlands. The degree of proximity and connection between metropolitan and regional urban centres is, to a significant extent, the salient feature for regional prosperity.

Going forward, this example of clustering to develop regional urban centre typologies suggests a policy utility in the process. While ostensibly the process is objective, the selection of variables used, the scope of the urban cities included and the number of clusters selected in the process will determine the outcomes, and these are decisions that are at the discretion of the analyst. This indicates a wider usefulness of hierarchical clustering, tailored to identify similar and disparate types of regional urban centres that can inform future regional development policy.

More broadly the cluster analysis demonstrates a diversity of regional centres in Australia. While recognition of this diversity is not novel, policies seeking to address issues in regional centres will necessarily have differential effects across regional centres because of their differing internal composition. Constructing the clusters may allow policy to be developed that targets particular clusters, or may allow the impacts of policy to be better understood in terms of which regional centres a particular set of measures may affect more, compared to others.

5. Policy development options

The rapid population growth of Australia during the 21st century, the role of high international migration, and the resulting issues in the capital cities have been a source of debate and contention between and within policy makers and the wider community. Prominent in these debates have been inter-related metropolitan issues, including:

- infrastructure shortages
- housing affordability
- access to employment
- congestion.

Along with concerns regarding the plight of some sections of regional Australia, these issues are at the source of the interest in regional migration and economic dynamics.

The analysis included in this report has provided insights that reflect many of these underlying issues. Migration analysis reveals that metropolitan residents are already moving to proximate cities and towns, leading to increases in what we term 'lifestyle employment', accompanied by housing-market inflation. Recent land-use planning strategies and advocacy documents indicate that the growing interconnections and expanding city regions are creating the need for greater metropolitan planning. The most prominent example is the South-east Queensland Regional Plan, which includes Noosa to the north of Brisbane, Toowoomba to the east and Coolangatta to the south on the NSW border (Department of Infrastructure, Local Government and Planning 2017). The Plan Melbourne Refresh metropolitan plan for Melbourne identifies a range of commutershed settlements suitable for population and economic growth, as well as Victoria's regional cities (Department of Environment, Land, Water and Planning 2017). The Committee for Sydney (2018) advocates for the region from Newcastle south through Sydney to Wollongong to be considered as a single entity connected by high-speed rail, due to the projected productivity, access to employment and housing affordability outcomes. These examples indicate progress towards metropolitan planning over an expanded spatial frame and, in the case of Sydney, an awareness of the issues and advantages. However, there is a need for coordinated approaches to a range of spatial, infrastructural, social and environmental issues at scales between local and state governments (Butt, Kroen et al. 2021).

Further afield, the 2011–2016 period saw mixed economic outcomes for Australia's regional centres, with differing employment and population trajectories that reflect wider national economic trends, as well as amenity and lifestyle attributes. This presents a challenge for policy makers concerned with population redistribution in Australia. Much of the current debate is framed with a metropolitan perspective, concerned with shifting population from the major cities to relieve metropolitan stresses, such as traffic congestion and high house prices. However, it could also be argued that the pre-Covid-19 situation of metropolitan population pressures is a result of an unwillingness of governments to directly intervene in questions of population and industry distribution, a likely result of neoliberalism (Tonts and Haslam-McKenzie 2005) and the tenor of the migration and population debates in recent years.

Within this context, this report offers four key policy recommendations.

1. The growth in metropolitan satellite regional urban centres and hinterlands, and increasing interaction between these centres, indicates a growing need for stronger metropolitan planning, for coherent approaches to population, housing and employment distribution and linkages. Such planning might attend to the changing spatial economic structures of greater metropolitan regions regarding desired spatial population and economic outcomes, and coordinate service delivery, land-use planning, infrastructure provision and governance at multiple spatial scales to achieve those objectives. However, this would require the development of such metro-regional objectives by relevant governments.
2. Regional policy needs to give greater attention to the distribution and composition of employment, rather than population per se—and specifically to high quality employment. Population redistribution is unlikely to affect significant change in regional urban centres outside the spheres of metropolitan influence, and in those locations it will tend to generate predominantly low-paid employment. However, there is anecdotal evidence of COVID-19-related regional migration occurring, including migration of persons employed in high-wage sectors. This may result in some higher-wage employment relocation to regional centres, but it remains unclear whether this reflects a substantial sustained shift in employment patterns. The intersections between population growth, employment and housing markets, particularly post-COVID, need further investigation if trends towards metropolitan expansion continue. Policy makers should ask whether the current trajectory of regional economic change is desirable, and address any undesirable outcomes through policy development.
3. The phenomenon of emerging low-income service economies with ageing populations in coastal and other regional urban centres should be an emerging concern for government. In the short-term, these urban centres may be buoyed by steady migration and employment, but future planning needs to be considering declining demand for aged-care services as the older population base declines in number.
4. Resource-dependent regional urban centres face cyclical economic changes based on the labour intensity of construction relative to ongoing economic activity. Greater focus needs to be placed on generating stable, ongoing employment in regional areas rather than the transient and temporary jobs created through infrastructure works. This also suggests that regional vocation education providers can support employment opportunities in regional areas. It may strengthen considerations of greater onshore 'value-adding' among extractive sectors.

5.1 Differentiating regional urban centres

The hierarchical clustering of regional urban centres is the capstone of this research, considering distinct economic profiles, population trajectories, industry structures and geography to establish a typology. These clusters are:

- C1: Metro-satellite
- C2: Large regional cities
- C3: Medium growth
- C4: Regional service
- C5: Ageing population
- C6: Agricultural centres
- C7: Mining centres
- C8: Industrial centres
- C9: Northern Queensland

The clustering identified distinct roles for regional urban centres:

- Clusters 1, 2 and 3 were metropolitan satellites and, as outlets for metropolitan growth, experienced net migration between 2011–2016.
- Clusters 4, 5 and 9 were more remote, fulfilling service roles for the surrounding communities, whether in general (Cluster 4), for ageing populations (Cluster 5), or for the geographically collocated urban centres in the north of Queensland (Cluster 9).
- Clusters 6, 7 and 8 had distinct economic functions in the agricultural, mining and industrial sectors. Given their greater degree of dependence on single sectors, they were susceptible to the cycles of their main industries.

While clusters 6, 7, and 8 were more likely to experience downturns in employment between 2011 and 2016, it is likely that their role in Australia's economy is clearer, as their specialisations indicate a stronger connection to export strengths and generating income from outside their FERs. Conversely, the urban centres in clusters 1, 2 and 3 recorded greater rates of population growth over the same period, yet their distinct economic functions and entities are being diluted through their increasing role as metropolitan outlets. The cities of Geelong and Wollongong are particular examples of this, as the impact of the decline of once-dominant industry specialisations has been mitigated by population growth and increased metro-bound commuting. The regional hubs and services centres of clusters 4 and 5 indicate an important role is sustaining their regional communities.

The shared circumstances across the regional urban centre typologies support previous calls for regional development and population policies that respond to the economic traits and circumstances within those communities (Beer, Akshay et al. 2020). However, such framings as the clustering undertaken in this research suggest that policymaking efficiencies may arise from understanding where there are shared circumstances.

5.2 Mobility and settlement patterns in regional Australia

Migration has been differentiated from mobility by adding factors that indicate changes to lifestyles that go beyond residential address—including employment and social factors. The difference is important in the context of the regional-mobility trends identified in this research.

First, there is a prevalence of short-distance relocations out of the metropolitan areas that may reflect regional mobility rather than migration involving the cessation of household economic linkages with the metropolis. Although distinguishing between mobility and migration is not entirely evident through census analysis, on the evidence presented in this report such redistributions are likely better viewed as mobility shifts and the expansion of the metropolitan sphere. People are moving, but not necessarily their jobs, indicating a form of regional suburbanisation.

Second, similarly short mobility patterns were identified in regional Australia, indicating circuits of household relocations within contained spaces of regional interaction. These migration regions included the set of ex-urban migration regions that connect regional urban centres into their adjacent major metropolitan centre, providing further support for the argument outlined above.

Third, there is some evidence of a general migration trend towards the capital cities, ending adjacent to if not within them. This indicates a process of regional population concentration in the urban centres that ring the metropolitan regions, and that are on average growing at a faster rate than other, more remote, regional centres.

Within regional Australia, international migration followed similar trends to internal migration, with a tendency to prefer the coastal urban centres of the north-east of the continent. While the international migration patterns indicate a strong preference for metropolitan locations, subsequent studies may investigate methods for understanding the longer-term mobility of migrant populations, and whether there is a dispersal into the regions after spending some years in the capital cities.

5.3 Further observations

The enduring appeal of regional living was affirmed, if not exacerbated, by the metropolitan experience of the 2020 COVID-19 pandemic, particularly in areas in the metropolitan periphery. However, the evidence presented in this report indicates that the regional urban centres located in metropolitan peripheries were already increasing in terms of population and employment. Whether such relocations are better described as mobility rather than migration, and whether the outcome can be described as metropolitan expansion, indicates that policy makers need to focus on improving employment outcomes in concert with population distribution questions.

The study findings offer at least three further possibilities for policy development, including relevance *Planning for Australia's Future Population* (PM&C 2019), which extends beyond the specific objectives of the study. The plan included intent to reduce migration rates and decentralise population while investing in regional road and rail infrastructure and services via 'Regional Deals'. It also aimed to attract post-secondary students to regional educational institutions and refine migration to more skilled migrants. In addition, the plan proposed a national population-planning framework. The present research offers insights into the potential for this plan to achieve its objectives, along with potential points of weakness that should be addressed if the plan is to be pursued.

Of particular importance for the national population plan is the evidence that regional employment growth is most strongly associated with population growth, particularly in coastal lifestyle and amenity locations. However, this employment growth tends to be in low-wage sectors that serve these growing populations. Without higher-wage employment following population or growing from lower-wage employment, such centres face long-term economic weaknesses and limit opportunities for their residents. For example, such centres may miss out on attracting or generating higher-waged financial services, professional services and ICT employment, as well as scientific services—which are all considered the basis for high productivity in advanced urban economies. Devising strategies that can broaden and deepen economic activity in these centres will be important to their longer-term economic and social resilience. The plan in *Planning for Australia's Future Population* should seek to address the question of higher-waged employment as part of its suite of programs.

Mining and agriculture remain sectors of both opportunity and vulnerability for regional urban centres. While the mining boom of the late-2000s boosted employment in some regional urban centres, much of this was in the mining sector, thus cyclical, and population declined along with employment in some centres as construction was completed. Comparable patterns may be found in agriculture, where mechanisation and digitalisation pose questions about future potential for employment growth and, in turn, population growth. Similar questions may be posed in relation to infrastructure projects used as regional stimulus. A recent example is the gas plant proposed by the Australian Government at Kurri Kurri, which is expected to create 660 jobs during construction. This may generate employment stimulus, but the longevity of the effect and the degree it exacerbates resource-sector cyclicality in Kurri Kurri and its functional economic region needs to be more carefully considered. Also, the examples of Collie and Wonthaggi (subsection 3.2.1) question the degree to which these skilled construction jobs are filled by local workers. The use and legacy of major construction projects as regional economic stimulus thus deserves further research and policy consideration.

Any policy seeking to actively distribute population more broadly across the Australian settlement system will need to consider the employment mix, particularly ongoing high-value jobs. There is limited evidence of market-led growth in higher-skill, higher-wage employment in regional centres. This has serious implications for the plan in *Planning for Australia's Future Population*, which in part assumes that high-skill migrants can be attracted to regions rather than major cities. Yet such migrants will tend to follow jobs, rather than lead them.

In the absence of strong high-wage or high-skill employment growth in regional centres, there may be scope for strengthening of spatial fiscal policy as a mechanism for achieving comparable effects. Australia has not pursued spatial industry policy for some decades, although the $660m Kurri Kurri gas plant announcement suggests an appetite for such government-led regional fiscal intervention. Where spending of this scale occurs, policy should consider inclusion of mechanisms to establish continuing higher-value employment in regional centres and attract high-skilled working populations to work in them, not just focussing on short-term construction jobs. But policy needs to move beyond short-term construction infrastructure, which is accompanied by doubts about its political motivations.

These findings are relevant to current policy discussions about the construction of fast rail links from metropolitan areas to proximate regional cities as a means of reducing metropolitan population pressures. Measures to redirect population growth to regional centres served by fast rail are risky from a longer-term economic sustainability perspective unless they are accompanied by a wider set of policy efforts to enable high-skill, high-wage employment in the receiving centres. In light of the earlier discussion about the economic dimensions of population growth, governments should consider widening the scope of fast rail schemes beyond infrastructure upgrades to encompass broader longer-term regional economic planning. As noted earlier, attempts to shift population to regional centres are potentially fraught unless they are accompanied by wider economic development interventions to ensure high-skill, higher-wage activity in the destination regions. This suggests that regional fast rail schemes need to expand their scope of intent to encompass a wider frame involving a broader and longer-term policy agenda. It also suggests that there is an avoidable naivete to policy development that is based solely on singular instruments, such as a rail infrastructure upgrade, without wider interventions, as indicated by experience in Europe (Chen and Hall 2013).

An active regional fiscal policy could be designed to concentrate higher-skill regional employment around selected regional urban centres and stimulate the critical mass that might support agglomeration economies. This could leverage off the student funding indicated in the *Planning for Australia's Future Population* plan (PM&C 2019) via coordination of public-sector higher education and research funding across multiple portfolios. For example, research expenditure (or at least a share of it) could be earmarked to be spent at one of the 13 Australian universities located in regional urban centres or at one of the many regional campuses of metropolitan universities. Federal research block grant funding is worth approximately $1bn per year, and is designed in a way that favours metropolitan universities, but there is no reason this could not be specified to be spent at regional universities. Research employment is by definition high-skill coordination. Coordination of research expenditure with spending in other policy domains, such as hospitals, energy and infrastructure might further leverage the value of both Commonwealth and state spending. This could be incorporated into Regional Deals under *Planning for Australia's Future Population* (PM&C 2019), which anticipates student scholarships for regional tertiary education institutions.

However, the use of fiscal policy to support regional urban centres raises questions of coordination. National spatial planning has been discussed occasionally in policy conversations since the 1970s, and recent moves to establish a national population plan have echoes of past efforts—even if they lack fiscal purchase. But if jobs—especially high-skill, high-wage jobs—are to accompany people in regional centres in the absence of market-led high-skill employment growth, fiscal policy offers an alternative supporting mechanism, which in turn requires a long-term coordinated plan and a degree of spatial focussing to be effective. This might, in turn, require innovation in the public sector.

Efforts of this nature have been attempted previously, such as during the urban and regional restructuring of the 1970s through the creation of the Department of Urban and Regional Development (DURD) which was tasked with coordinating all portfolio expenditures to achieve urban and regional efficiency (Taylor 2000). It is of note that in the years since the DURD, the neoliberal and non-interventionalist approach (Tonts and Haslam-McKenzie 2005) has seen the re-emergence of the issues that underpin this research: the concentration of population and opportunity in the metropolitan areas, while some parts of regional areas have experienced decline. There have been substantial changes to national settlement structures and social patterns since the 1970s, but the essential aspect of federally coordinated approaches to regional development across land use, transport, economy and institutions—with government as a partner in regional innovation and development—may provide a basis for further policy development (Mazzucato 2016; 2021).

A version of such an approach, focussed on cities, is currently underway via the 'City Deals' program, rather than regional centres per se, though many of these City Deals have focussed on regional cities. This also has relevance to *Planning for Australia's Future Population* (PM&C 2019), which proposes Regional Deals, although it is not clear on what basis these are being developed. So far three Regional Deals have been initiated in Barkly, Hinkler and Albury–Wodonga. It is not clear that these deals are aligned with a clear prioritisation method for identifying regional centres facing rapid population growth, such as could be identified via data presented in this research. It would be problematic from an efficiency and outcome perspective if the serious issues of questionable resource allocation to urban spatial programs identified within *Planning for Australia's Future Population* (PM&C 2019; see also ANAO 2021) were to afflict the Regional Deals.

Further research would be needed to investigate the wider question of federal policy coordination at the regional scale along with merit-based approaches to selection of interventions; however, that is beyond the aims and questions of the present empirically oriented study.

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Appendix 1: Shift-share analysis

For every regional city (UCL), the shift-share components are calculated using these equations:

National job growth rate between 2011 and 2016 (regional cities) = 0.092

UCL National shift (industry)
= UCL 2011jobs (industry) * National job growth rate 2011-2016 (0.092+1)

UCL Industry mix (industry)
= UCL 2011jobs (industry) * (National job growth rate 2011-2016 (industry) - National job growth rate 2011-2016 (0.092 +1))

UCL Regional shift (industry)
= UCL 2011jobs (industry) * (UCL job growth rate 11-16 (industry) - (National job growth rate 2011-2016 (industry))

Actual UCL job growth (industry)
= UCL National shift (industry) + UCL Industry mix (industry) + UCL Regional shift (industry)

Actual total job growth
= Sum (actual UCL job growth (industry))

Appendix 2: Modularity analysis of FERs and broader migration region

In this study, we applied a new method to construct FERs using journey to work (JTW) flow data for Australia (SA2 level). First, this technique transforms the JTW flow data into a weighted directional spatial network consisting of a matrix of links and nodes. A node represents a commute origin or destination (SA2), while a link represents the number of commutes from one node to another in the spatial network. Then a modularity analysis (a form of network structure analysis) is applied to identify SA2s where a high level of commuting interactions concentrates and forms a 'local community' in the spatial network.

The community of networks is then optimised through a procedure that allows nodes moving within the spatial network to find their closest possible community during the course the communities are changing. This procedure runs iteratively until no further change in communities (or increase of modularity) is possible and a final network of communities is constructed.

The number and dimensionality of communities is determined by a modularity score Q computed by formula 1. Every gain in modularity obtained by moving a node into a community C can be computed by formula 2:

$$Q = \frac{1}{2m} \sum_C \sum_{i \in C, j \in C} \left[A_{ij} - \left(\frac{d_i d_j}{2m} \right) \right] \qquad (1)$$

$$\Delta Q = \left[\frac{\sum_{in} + 2d_{i,in}}{2m} - \left(\frac{\sum_{tot} + d_i}{2m} \right)^2 \right] - \left[\frac{\sum_{in}}{2m} - \left(\frac{\sum_{tot}}{2m} \right)^2 - \left(\frac{d_i}{2m} \right)^2 \right] \qquad (2)$$

The network analysis then identified clusters of SA2 that have a high level of economic connectivity via commuting. They form functionally coherent geographic economic regions within which the highly connected labour markets and job markets are concentrated. Workers in aggregate tend to live and work within each FER, with few commutes going beyond the FER boundary. We also tested the level of employment self-containment captured by the FERs. It shows that the FERs created by the modularity analysis capture a slightly higher level of self-containment of economic activities (67%) than is captured by the FERs produced by previous methods. This outcome demonstrates the modularity analysis can be applied to JTW data to identify the network of self-contained economies in Australia.

In this project, the modularity analysis is also applied to identify broad migration regions in Australia using internal migration flow data at SA2 level, and same algorithms represented by formula 1 and formula 2.

Appendix 3: Regional urban centre data 2011–2016

Table A1: Total population in regional cities 2011 and 2016 (sorted by population growth, from high to low)

Regional city	Population 2011	Population 2016	Population change 2011–16	Population change rate
Airlie Beach–Cannonvale	10549	12932	2383	0.23
Albany	30658	33143	2485	0.08
Albury–Wodonga (Albury part)	46559	49667	3108	0.07
Albury–Wodonga (Wodonga part)	35524	39348	3824	0.11
Alice Springs	25183	24755	-428	-0.02
Alstonville	15694	16835	1141	0.07
Anna Bay–Boat Harbour	5431	5726	295	0.05
Ararat	8078	8301	223	0.03
Armidale	22469	23348	879	0.04
Atherton	10167	10713	546	0.05
Ayr	9152	9097	-55	-0.01
Bacchus Marsh	17156	20345	3189	0.19
Bairnsdale	13240	14726	1486	0.11
Ballarat	91791	99887	8096	0.09
Ballina	16167	17115	948	0.06
Bargara–Innes Park	15386	16595	1209	0.08
Batemans Bay	15727	16050	323	0.02
Bathurst	32483	35016	2533	0.08
Beaudesert	12379	13917	1538	0.12
Beerwah	7198	8201	1003	0.14
Benalla	10333	10330	-3	0.00
Bendigo	86088	94380	8292	0.10
Biloela	5884	5764	-120	-0.02
Blue Mountains	29936	30552	616	0.02
Bongaree–Woorim	17047	18145	1098	0.06
Bowen	8851	9100	249	0.03

Regional city	Population 2011	Population 2016	Population change 2011–16	Population change rate
Bowral–Mittagong	20255	21947	1692	0.08
Broken Hill	18519	17709	-810	-0.04
Broome	12765	13984	1219	0.10
Bunbury	65610	72395	6785	0.10
Bundaberg	51951	52472	521	0.01
Burnie–Somerset	20873	20400	-473	-0.02
Busselton	21898	26334	4436	0.20
Byron Bay	8654	9503	849	0.10
Cairns	133896	144778	10882	0.08
Camden Haven	15740	16743	1003	0.06
Canberra–Queanbeyan (Queanbeyan part)	36046	36506	460	0.01
Casino	11834	12231	397	0.03
Castlemaine	9733	10583	850	0.09
Central Coast	303799	318620	14821	0.05
Cessnock	20262	21995	1733	0.09
Charters Towers	8235	8126	-109	-0.01
Chinchilla	7084	8132	1048	0.15
Cobram	6242	6345	103	0.02
Coffs Harbour	52795	55972	3177	0.06
Colac	11776	12250	474	0.04
Collie	9126	8798	-328	-0.04
Cooma	6677	6737	60	0.01
Cootamundra	7445	7566	121	0.02
Corowa–Wahgunyah (Corowa part)	5606	5482	-124	-0.02
Cowra	8926	9144	218	0.02
Crafers–Bridgewater	17319	17472	153	0.01
Dalby	16542	17023	481	0.03
Deniliquin	7121	7434	313	0.04
Devonport	24821	24870	49	0.00
Drouin	13220	16210	2990	0.23
Drysdale–Clifton Springs	11699	13348	1649	0.14
Dubbo	39157	41716	2559	0.06
Dunsborough	8385	10283	1898	0.23
Echuca–Moama (Echuca part)	14192	14577	385	0.03
Echuca–Moama (Moama part)	5117	5845	728	0.14
Emerald	13219	13529	310	0.02

Regional city	Population 2011	Population 2016	Population change 2011–16	Population change rate
Esperance	11433	12111	678	0.06
Forbes	9805	10166	361	0.04
Forster–Tuncurry	19498	20452	954	0.05
Gatton	7179	7431	252	0.04
Gawler	26400	28996	2596	0.10
Geelong	147809	157276	9467	0.06
Geraldton	35753	37428	1675	0.05
Gisborne	11075	12827	1752	0.16
Gladstone	32307	33967	1660	0.05
Glen Innes	8655	8832	177	0.02
Gold Coast–Tweed Heads (Tweed Heads part)	55171	59599	4428	0.08
Goolwa	10439	11125	686	0.07
Goondiwindi	6396	6356	-40	-0.01
Gordonvale	8039	8666	627	0.08
Goulburn	21485	22890	1405	0.07
Gracemere	8868	11668	2800	0.32
Grafton	18360	18673	313	0.02
Griffith	17901	19143	1242	0.07
Gunnedah	8731	9191	460	0.05
Gympie	19508	20965	1457	0.07
Hamilton	10104	9970	-134	-0.01
Healesville	12843	13703	860	0.07
Helensburgh	8458	8788	330	0.04
Hervey Bay	48682	52073	3391	0.07
Highfields	11248	13177	1929	0.17
Horsham	15894	16252	358	0.02
Innisfail	9220	9377	157	0.02
Inverell	11399	11660	261	0.02
Jimboomba West	19706	25744	6038	0.31
Kalgoorlie–Boulder	30838	29868	-970	-0.03
Karratha	16474	15825	-649	-0.04
Katherine	9210	9780	570	0.06
Kempsey	14292	14756	464	0.03
Kiama	12903	13570	667	0.05
Kilmore	11947	13872	1925	0.16
Kingaroy	9809	10288	479	0.05

Regional city	Population 2011	Population 2016	Population change 2011–16	Population change rate
Kurri Kurri	16198	17639	1441	0.09
Kyabram	10737	10906	169	0.02
Lakes Entrance	9462	9917	455	0.05
Lara	15523	18088	2565	0.17
Launceston	75365	76843	1478	0.02
Leeton	9889	10086	197	0.02
Lennox Head	7341	7741	400	0.05
Leongatha	10524	11081	557	0.05
Leopold	10112	12814	2702	0.27
Lismore	28281	28404	123	0.00
Lithgow	12251	12814	563	0.05
Mackay	73657	78689	5032	0.07
Maitland (NSW)	72565	82514	9949	0.14
Mareeba	10181	11078	897	0.09
Margaret River	7323	8828	1505	0.21
Maryborough (QLD)	26217	26925	708	0.03
Maryborough (VIC)	7631	7922	291	0.04
Medowie	12579	13673	1094	0.09
Melton	47679	59890	12211	0.26
Merimbula	9779	10621	842	0.09
Mildura–Buronga (Mildura part)	37125	39493	2368	0.06
Moe–Newborough	16675	16550	-125	-0.01
Moranbah	8966	8735	-231	-0.03
Moree	8397	8203	-194	-0.02
Morisset–Cooranbong	21777	23682	1905	0.09
Morwell	14004	13811	-193	-0.01
Moss Vale	8935	9801	866	0.10
Mount Barker (SA)	14917	17367	2450	0.16
Mount Cotton	6496	7904	1408	0.22
Mount Gambier	27754	28680	926	0.03
Mount Isa	20569	18342	-2227	-0.11
Mudgee	10484	11727	1243	0.12
Murray Bridge	16706	17557	851	0.05
Murwillumbah	17787	18595	808	0.05
Muswellbrook	11791	12072	281	0.02
Nambour	18136	19961	1825	0.10

Regional city	Population 2011	Population 2016	Population change 2011–16	Population change rate
Nambucca Heads	6664	6752	88	0.01
Naracoorte	5693	6038	345	0.06
Narrabri	6929	7170	241	0.03
Nelson Bay	19644	21015	1371	0.07
New Norfolk	6332	6602	270	0.04
Newcastle	312455	327075	14620	0.05
Northam	10557	11115	558	0.05
Nowra–Bomaderry	33341	35799	2458	0.07
Nuriootpa	5969	6546	577	0.10
Ocean Grove–Barwon Heads	18356	23424	5068	0.28
Orange	36464	38739	2275	0.06
Parkes	10939	10983	44	0.00
Port Augusta	13657	13516	-141	-0.01
Port Hedland	13769	13832	63	0.00
Port Lincoln	15222	15686	464	0.03
Port Macquarie	41722	45376	3654	0.09
Port Pirie	14044	14007	-37	0.00
Portarlington–St Leonards	6498	7401	903	0.14
Portland (VIC)	10715	10799	84	0.01
Pottsville	12138	13181	1043	0.09
Raymond Terrace	13736	13825	89	0.01
Rockhampton	64811	65307	496	0.01
Roma	6905	6853	-52	-0.01
Sale	14259	14646	387	0.03
Sandstone Point–Ningi	13485	14892	1407	0.10
Seymour	6370	6332	-38	-0.01
Shepparton–Mooroopna	46496	49677	3181	0.07
Singleton	16133	16094	-39	0.00
South West Rocks	4953	5133	180	0.04
St Georges Basin–Sanctuary Point	12610	14006	1396	0.11
Stawell	8273	8096	–177	-0.02
Strathalbyn	6453	7097	644	0.10
Summerland Point–Gwandalan	5400	5765	365	0.07
Sunbury	36852	39362	2510	0.07
Sunshine Coast	233069	266440	33371	0.14
Swan Hill	10431	10907	476	0.05

Regional city	Population 2011	Population 2016	Population change 2011–16	Population change rate
Tamborine Mountain	13138	14272	1134	0.09
Tamworth	38737	41012	2275	0.06
Tannum Sands–Boyne Island	9655	9898	243	0.03
Taree	20107	20478	371	0.02
Toowoomba	105982	111129	5147	0.05
Torquay–Jan Juc	15043	18361	3318	0.22
Townsville	162314	173806	11492	0.07
Traralgon	25701	26788	1087	0.04
Tumut	6295	6275	–20	0.00
Ulladulla	14148	15279	1131	0.08
Ulverstone	14110	14151	41	0.00
Victor Harbor	13413	14374	961	0.07
Wagga Wagga	52043	54410	2367	0.05
Wallan	12030	16218	4188	0.35
Wangaratta	17687	18715	1028	0.06
Warragul	16723	18761	2038	0.12
Warrnambool	32380	34020	1640	0.05
Warwick	14609	15133	524	0.04
Wauchope	10214	11150	936	0.09
Whyalla	21992	21754	–238	-0.01
Wollongong	247585	263330	15745	0.06
Wonthaggi	20035	22228	2193	0.11
Wynyard	5991	6088	97	0.02
Yamba	15845	16283	438	0.03
Yarrawonga–Mulwala (Yarrawonga part)	7056	7929	873	0.12
Yass	6331	6502	171	0.03
Yeppoon	16372	18111	1739	0.11
Young	10280	10604	324	0.03

Source: ABS census data, authors' calculations.

Table A2: Key economic variables of regional cities

City name	Total jobs	Job growth	Worker income	Production industry	Lifestyle industry	Resource industry	Industry* pecialisation	SCI 2011–16
Queanbeyan	10881	-0.014	1181.3	0.156	0.235	0.003	0.094	0.084
Central Coast	101666	0.063	1038.4	0.124	0.294	0.014	0.096	0.056
Tweed Heads	18988	0.109	1001.5	0.078	0.334	0.015	0.109	0.055
Newcastle	139948	0.030	1159.0	0.119	0.251	0.013	0.095	0.067
Wollongong	93121	0.070	1124.1	0.129	0.262	0.014	0.092	0.060
Albury	23936	0.019	1059.4	0.135	0.284	0.009	0.095	0.055
Maitland (NSW)	32639	0.105	1121.5	0.169	0.252	0.053	0.080	0.096
Armidale	10767	0.017	1097.7	0.061	0.258	0.026	0.121	0.040
Bathurst	16035	0.047	1101.4	0.133	0.261	0.018	0.091	0.071
Blue Mountains	9015	0.042	968.4	0.072	0.356	0.003	0.110	0.049
Bowral–Mittagong	10287	0.073	1042.8	0.104	0.316	0.018	0.102	0.068
Cessnock	6235	0.001	983.4	0.059	0.357	0.009	0.117	0.058
Coffs Harbour	24576	0.048	1021.0	0.093	0.310	0.020	0.102	0.046
Dubbo	18137	0.039	1118.0	0.144	0.271	0.014	0.091	0.045
Goulburn	9792	0.035	1084.1	0.123	0.273	0.016	0.101	0.054
Lismore	17089	-0.026	1061.9	0.092	0.263	0.010	0.125	0.045
Nowra–Bomaderry	18859	0.054	1124.8	0.120	0.232	0.013	0.108	0.068
Orange	18201	0.033	1169.1	0.106	0.252	0.027	0.104	0.061
Port Macquarie	19774	0.092	1072.5	0.082	0.294	0.003	0.104	0.068
Tamworth	21063	0.050	1084.0	0.166	0.267	0.021	0.091	0.043
Wagga Wagga	27292	0.033	1108.4	0.135	0.254	0.012	0.096	0.057
Ballina	8753	0.036	1001.5	0.097	0.324	0.008	0.110	0.060
Batemans Bay	5211	0.031	946.3	0.085	0.380	0.020	0.103	0.065
Broken Hill	6672	-0.016	1166.2	0.079	0.279	0.132	0.100	0.054
Moama	1752	0.111	944.2	0.185	0.461	0.031	0.131	0.081
Forster–Tuncurry	6466	0.045	922.6	0.056	0.372	0.018	0.109	0.050
Grafton	9269	-0.032	1033.8	0.113	0.282	0.022	0.102	0.077
Griffith	8509	0.074	1032.4	0.155	0.305	0.044	0.092	0.059
Kempsey	6405	0.008	993.5	0.116	0.256	0.015	0.111	0.056
Kiama	3386	0.012	935.4	0.058	0.379	0.007	0.101	0.076
Kurri Kurri	3289	0.055	938.3	0.125	0.303	0.026	0.102	0.214
Lithgow	4930	-0.021	1064.0	0.135	0.264	0.014	0.099	0.064
Morisset–Cooranbong	6717	0.074	1125.8	0.124	0.217	0.085	0.092	0.091
Mudgee	5157	0.094	1003.8	0.098	0.343	0.053	0.087	0.051
Muswellbrook	7326	-0.093	1471.3	0.097	0.182	0.284	0.116	0.072

City name	Total jobs	Job growth	Worker income	Production industry	Lifestyle industry	Resource industry	Industry* pecialisation	SCI 2011–16
Nelson Bay	6634	0.061	902.0	0.067	0.425	0.007	0.115	0.049
Raymond Terrace	9726	-0.045	1251.6	0.329	0.246	0.036	0.109	0.126
Singleton	7975	-0.058	1174.1	0.096	0.247	0.187	0.089	0.095
Sanctuary Point	1488	0.146	817.7	0.050	0.303	0.005	0.139	0.072
Taree	10394	-0.016	985.0	0.122	0.282	0.014	0.125	0.056
Ulladulla	4998	0.072	865.3	0.080	0.398	0.019	0.103	0.053
Alstonville	4371	0.048	980.9	0.127	0.169	0.183	0.064	0.070
Anna Bay–Boat Harbour	774	0.038	891.2	0.148	0.360	0.041	0.104	0.086
Byron Bay	6104	0.076	974.5	0.128	0.417	0.009	0.103	0.070
Camden Haven	2990	0.060	899.2	0.092	0.339	0.047	0.098	0.080
Casino	4626	0.000	952.3	0.291	0.226	0.040	0.111	0.060
Cooma	3331	-0.014	1044.7	0.098	0.305	0.024	0.090	0.042
Cootamundra	2636	-0.011	1028.3	0.233	0.205	0.138	0.071	0.066
Corowa	2226	-0.055	1009.5	0.202	0.290	0.140	0.071	0.124
Cowra	3666	0.029	967.2	0.179	0.280	0.060	0.087	0.054
Deniliquin	3140	0.023	1046.1	0.160	0.249	0.043	0.085	0.062
Forbes	3894	0.006	995.2	0.123	0.224	0.210	0.063	0.044
Glen Innes	2976	-0.063	924.1	0.095	0.251	0.205	0.061	0.067
Gunnedah	3770	0.073	1077.7	0.143	0.283	0.079	0.078	0.076
Helensburgh	2000	0.065	1169.1	0.047	0.237	0.175	0.101	0.136
Inverell	5219	0.017	941.4	0.210	0.280	0.036	0.100	0.057
Leeton	4163	0.016	1056.6	0.282	0.185	0.102	0.090	0.062
Lennox Head	1477	0.069	1016.9	0.042	0.320	0.012	0.108	0.057
Medowie	6433	0.044	1422.0	0.152	0.136	0.026	0.216	0.123
Merimbula	3523	0.056	884.6	0.100	0.426	0.022	0.109	0.059
Moree	3592	-0.034	1133.3	0.116	0.266	0.054	0.079	0.065
Moss Vale	4300	0.085	1141.6	0.245	0.272	0.042	0.082	0.119
Murwillumbah	6372	0.041	976.1	0.146	0.236	0.070	0.076	0.059
Nambucca Heads	1845	0.006	871.0	0.052	0.355	0.010	0.126	0.096
Narrabri	3032	0.010	1047.9	0.122	0.295	0.067	0.079	0.071
Parkes	3967	-0.038	1044.3	0.135	0.306	0.037	0.091	0.081
Pottsville	2248	0.094	876.5	0.072	0.311	0.083	0.090	0.072
South West Rocks	1038	-0.011	788.3	0.068	0.455	0.032	0.119	0.090
Summerland Point	448	0.140	913.1	0.091	0.333	0.000	0.107	0.150
Tumut	3127	-0.078	1111.7	0.242	0.236	0.076	0.092	0.072
Wauchope	3073	0.044	975.7	0.191	0.245	0.063	0.083	0.072

City name	Total jobs	Job growth	Worker income	Production industry	Lifestyle industry	Resource industry	Industry* pecialisation	SCI 2011–16
Yamba	4752	0.016	892.0	0.119	0.342	0.046	0.094	0.062
Yass	2184	-0.025	994.2	0.086	0.312	0.055	0.095	0.078
Young	4285	0.022	963.3	0.137	0.285	0.103	0.079	0.059
Geelong	78046	0.052	1106.4	0.141	0.269	0.006	0.099	0.061
Wodonga	18433	0.081	1113.8	0.209	0.213	0.012	0.093	0.069
Ballarat	44599	0.061	1054.1	0.145	0.267	0.014	0.098	0.060
Bendigo	40330	0.064	1048.8	0.118	0.269	0.014	0.097	0.051
Melton	11358	0.164	928.1	0.105	0.338	0.009	0.104	0.054
Mildura	16483	0.068	993.4	0.130	0.301	0.034	0.089	0.043
Shepparton–Mooroopna	21779	0.028	1025.1	0.135	0.271	0.028	0.097	0.066
Sunbury	7668	0.043	912.6	0.069	0.369	0.014	0.103	0.064
Traralgon	11945	0.002	1043.7	0.079	0.289	0.014	0.112	0.043
Warrnambool	16254	0.034	1004.6	0.159	0.284	0.020	0.096	0.033
Bacchus Marsh	5055	0.156	961.9	0.129	0.263	0.063	0.091	0.048
Bairnsdale	8422	0.041	989.1	0.178	0.274	0.017	0.100	0.052
Colac	6515	0.003	977.6	0.253	0.229	0.031	0.105	0.075
Drouin	3478	0.143	916.8	0.125	0.258	0.125	0.074	0.098
Drysdale–Clifton Springs	2299	0.103	940.9	0.077	0.284	0.029	0.110	0.058
Echuca-Moama	7748	0.026	993.3	0.165	0.316	0.024	0.101	0.069
Horsham	7685	0.001	994.6	0.107	0.294	0.019	0.097	0.060
Lara	5535	0.129	1090.4	0.256	0.226	0.065	0.090	0.182
Leopold	1308	0.236	851.5	0.050	0.373	0.011	0.131	0.075
Moe–Newborough	4567	-0.012	1048.2	0.075	0.274	0.029	0.091	0.069
Morwell	9203	-0.068	1154.1	0.240	0.214	0.022	0.099	0.075
Ocean Grove–Barwon Heads	4789	0.272	915.9	0.078	0.383	0.017	0.096	0.067
Portland (VIC)	5076	-0.060	1112.3	0.297	0.241	0.028	0.101	0.077
Sale	7093	-0.010	1027.5	0.073	0.313	0.017	0.111	0.062
Swan Hill	5632	-0.012	981.1	0.174	0.281	0.026	0.089	0.043
Torquay–Jan Juc	5275	0.195	977.6	0.117	0.361	0.017	0.091	0.087
Wangaratta	9644	0.017	1015.4	0.134	0.259	0.009	0.114	0.048
Warragul	8616	0.086	1000.7	0.120	0.267	0.068	0.085	0.066
Ararat	3776	-0.006	1019.4	0.190	0.213	0.024	0.113	0.084
Benalla	4262	-0.069	1010.9	0.216	0.248	0.034	0.088	0.074
Castlemaine	5372	0.047	982.7	0.306	0.211	0.010	0.134	0.055
Cobram	3285	0.000	1055.4	0.282	0.231	0.094	0.095	0.046
Gisborne	3659	0.123	921.9	0.091	0.292	0.013	0.090	0.087

City name	Total jobs	Job growth	Worker income	Production industry	Lifestyle industry	Resource industry	Industry* pecialisation	SCI 2011–16
Hamilton	4953	-0.050	1001.2	0.110	0.264	0.058	0.098	0.063
Healesville	4041	0.043	889.1	0.154	0.391	0.048	0.090	0.053
Kilmore	3671	0.133	1009.9	0.150	0.222	0.030	0.099	0.065
Kyabram	3806	0.008	958.4	0.256	0.180	0.173	0.085	0.068
Lakes Entrance	2478	-0.019	832.6	0.077	0.406	0.054	0.113	0.055
Leongatha	5108	-0.018	1020.1	0.170	0.223	0.149	0.066	0.062
Maryborough (VIC)	3272	-0.001	872.4	0.207	0.307	0.014	0.119	0.053
Portarlington–St Leonards	1039	0.110	867.2	0.088	0.399	0.097	0.099	0.087
Seymour	2733	-0.047	974.4	0.157	0.311	0.031	0.094	0.045
Stawell	3310	-0.064	961.0	0.184	0.259	0.121	0.093	0.069
Wallan	2214	0.321	853.1	0.081	0.382	0.024	0.113	0.094
Wonthaggi	6819	0.040	936.5	0.098	0.316	0.079	0.087	0.208
Yarrawonga	2305	0.091	898.7	0.092	0.323	0.031	0.120	0.058
Cairns	63141	0.046	1117.6	0.129	0.298	0.011	0.088	0.052
Sunshine Coast	98597	0.139	1031.7	0.097	0.322	0.008	0.089	0.057
Toowoomba	53056	0.019	1129.4	0.133	0.241	0.030	0.091	0.056
Townsville	76939	0.000	1160.5	0.120	0.243	0.010	0.095	0.069
Bundaberg	22399	-0.014	1016.7	0.132	0.272	0.026	0.107	0.052
Hervey Bay	15442	0.043	963.7	0.072	0.319	0.009	0.119	0.051
Mackay	36117	-0.042	1158.7	0.175	0.274	0.060	0.079	0.096
Rockhampton	33029	-0.043	1135.1	0.147	0.257	0.020	0.091	0.053
Gladstone	17595	-0.049	1349.6	0.266	0.233	0.023	0.083	0.093
Maryborough (QLD)	9917	-0.076	1029.1	0.162	0.238	0.020	0.096	0.073
Bargara–Innes Park	2552	0.090	926.3	0.102	0.283	0.169	0.068	0.103
Bongaree–Woorim	3501	-0.014	900.5	0.060	0.402	0.008	0.111	0.071
Dalby	7524	0.018	1107.1	0.147	0.226	0.188	0.058	0.053
Emerald	5361	-0.092	1122.6	0.127	0.314	0.066	0.080	0.097
Gracemere	1991	0.185	1108.8	0.278	0.259	0.049	0.102	0.129
Gympie	10506	-0.001	987.7	0.153	0.275	0.023	0.098	0.050
Kingaroy	5191	0.006	942.7	0.191	0.280	0.034	0.106	0.048
Mount Isa	8327	-0.099	1500.3	0.088	0.191	0.302	0.135	0.057
Nambour	12756	0.084	1178.1	0.065	0.160	0.013	0.235	0.068
Warwick	6815	-0.023	951.0	0.224	0.289	0.026	0.094	0.066
Yeppoon	5231	0.068	963.1	0.067	0.346	0.030	0.096	0.075
Airlie Beach–Cannonvale	6269	0.160	972.4	0.141	0.528	0.008	0.161	0.056
Atherton	4928	0.023	961.6	0.078	0.281	0.147	0.082	0.071

City name	Total jobs	Job growth	Worker income	Production industry	Lifestyle industry	Resource industry	Industry* pecialisation	SCI 2011–16
Ayr	3943	-0.030	972.4	0.107	0.302	0.086	0.083	0.049
Beaudesert	5027	0.043	978.3	0.126	0.241	0.122	0.073	0.059
Beerwah	2903	0.142	904.9	0.109	0.354	0.126	0.078	0.087
Biloela	2834	-0.036	1110.2	0.122	0.263	0.110	0.073	0.090
Bowen	2795	-0.045	976.8	0.103	0.292	0.082	0.085	0.072
Charters Towers	2940	-0.104	1015.7	0.086	0.283	0.034	0.115	0.069
Chinchilla	3754	-0.017	1299.3	0.086	0.219	0.215	0.066	0.074
Gatton	4337	-0.024	992.0	0.129	0.244	0.151	0.077	0.101
Goondiwindi	2964	-0.040	1057.9	0.125	0.288	0.130	0.070	0.056
Gordonvale	2237	0.084	1052.2	0.174	0.231	0.107	0.086	0.089
Highfields	2496	0.148	1022.6	0.062	0.258	0.052	0.097	0.086
Innisfail	4151	-0.053	981.5	0.104	0.279	0.052	0.100	0.078
Jimboomba West	3613	0.299	968.5	0.095	0.262	0.032	0.107	0.101
Mareeba	4544	0.055	1002.3	0.139	0.227	0.147	0.067	0.066
Moranbah	7495	-0.120	1893.1	0.064	0.113	0.613	0.385	0.139
Mount Cotton	1967	0.206	1067.8	0.361	0.128	0.083	0.159	0.074
Roma	4143	-0.024	1280.7	0.118	0.215	0.120	0.078	0.070
Sandstone Point–Ningi	1687	0.063	938.6	0.089	0.257	0.182	0.067	0.158
Tamborine Mountain	3646	0.051	976.0	0.079	0.332	0.063	0.088	0.050
Tannum Sands–Boyne Island	2760	-0.085	1338.9	0.389	0.219	0.015	0.187	0.131
Gawler	8113	0.049	986.7	0.124	0.313	0.035	0.096	0.062
Mount Gambier	12958	0.011	999.8	0.187	0.297	0.049	0.089	0.055
Whyalla	6841	-0.090	1097.7	0.175	0.264	0.057	0.093	0.066
Crafers–Bridgewater	4056	-0.063	972.7	0.077	0.343	0.029	0.090	0.059
Mount Barker (SA)	6940	0.120	961.4	0.127	0.328	0.023	0.101	0.062
Murray Bridge	7221	0.051	955.1	0.229	0.266	0.030	0.092	0.073
Port Augusta	5207	-0.069	1106.4	0.092	0.269	0.025	0.107	0.070
Port Lincoln	6636	-0.010	1015.8	0.147	0.288	0.077	0.081	0.037
Port Pirie	5758	-0.017	1100.6	0.217	0.254	0.012	0.114	0.045
Victor Harbor	4221	0.023	901.3	0.061	0.346	0.025	0.115	0.055
Goolwa	2675	-0.008	867.8	0.112	0.321	0.029	0.098	0.063
Naracoorte	2625	0.038	950.7	0.149	0.293	0.093	0.081	0.048
Nuriootpa	3664	0.077	1076.3	0.294	0.241	0.049	0.109	0.084
Strathalbyn	1959	0.019	938.9	0.118	0.282	0.065	0.102	0.121
Bunbury	28560	0.024	1122.4	0.128	0.288	0.018	0.093	0.046
Albany	13051	0.060	1093.6	0.098	0.280	0.031	0.091	0.056

City name	Total jobs	Job growth	Worker income	Production industry	Lifestyle industry	Resource industry	Industry* pecialisation	SCI 2011–16
Busselton	9350	0.165	1035.5	0.085	0.322	0.026	0.097	0.061
Geraldton	14759	-0.027	1193.9	0.136	0.264	0.043	0.086	0.053
Kalgoorlie–Boulder	12825	-0.051	1392.7	0.134	0.243	0.173	0.086	0.112
Broome	6712	0.065	1385.7	0.120	0.276	0.026	0.093	0.069
Esperance	4914	0.015	1160.7	0.195	0.279	0.079	0.074	0.039
Karratha	6508	-0.088	1609.2	0.145	0.228	0.097	0.075	0.156
Port Hedland	8684	-0.007	1892.9	0.189	0.159	0.294	0.132	0.138
Collie	4425	-0.208	1611.4	0.186	0.169	0.239	0.120	0.333
Dunsborough	4030	0.165	1034.8	0.158	0.331	0.136	0.086	0.051
Margaret River	3808	0.213	974.2	0.125	0.358	0.045	0.088	0.063
Northam	4259	-0.029	1214.1	0.131	0.191	0.068	0.085	0.099
Launceston	36499	-0.028	1042.6	0.114	0.289	0.011	0.096	0.067
Devonport	11289	-0.028	984.2	0.211	0.289	0.033	0.082	0.062
Burnie–Somerset	10795	-0.046	1049.6	0.171	0.253	0.031	0.096	0.097
Ulverstone	4619	-0.004	972.8	0.189	0.281	0.059	0.084	0.069
New Norfolk	1765	0.021	1055.1	0.248	0.244	0.041	0.117	0.065
Wynyard	1856	-0.038	936.2	0.240	0.277	0.079	0.086	0.085
Alice Springs	11686	-0.047	1337.3	0.076	0.238	0.015	0.105	0.070
Katherine	4286	-0.031	1349.7	0.072	0.171	0.071	0.119	0.075

Source: ABS census data, authors' calculations.

Table A3: Key geographic and transport variables of regional cities

	City name	Distance to capital cities (km)	JTW to capital cities (%)	Distance to nearest regional city (km)	Coastal city (yes = 1; no=0)	Rail access (yes = 1; no=0)
1	Queanbeyan	14.3	0.671	14.3	0	1
2	Central Coast	59.9	0.190	35.7	1	1
3	Tweed Heads	39.5	0.292	8.7	1	0
4	Newcastle	111.5	0.015	18.3	1	1
5	Wollongong	67.4	0.141	17.0	1	1
6	Albury	224.3	0.004	13.2	0	1
7	Maitland (NSW)	126.1	0.007	10.9	0	1
8	Armidale	304.9	0.005	75.8	0	1
9	Bathurst	147.0	0.011	48.1	0	1
10	Blue Mountains	66.8	0.405	28.5	0	1
11	Bowral–Mittagong	83.8	0.156	7.9	0	1
12	Cessnock	107.7	0.008	13.3	0	1
13	Coffs Harbour	233.2	0.004	38.5	1	1
14	Dubbo	281.3	0.005	99.0	0	1
15	Goulburn	78.9	0.064	72.9	0	1
16	Lismore	86.2	0.002	13.7	0	1
17	Nowra–Bomaderry	105.8	0.015	25.5	0	1
18	Orange	197.3	0.004	52.8	0	1
19	Port Macquarie	308.9	0.007	19.0	1	0
20	Tamworth	271.8	0.003	67.7	0	1
21	Wagga Wagga	173.0	0.004	83.5	0	1
22	Ballina	90.6	0.007	5.3	1	0
23	Batemans Bay	116.1	0.016	46.5	1	0
24	Broken Hill	413.4	0.004	234.1	0	1
25	Echuca–Moama (Moama part)	182.3	0.007	3.7	0	1
26	Forster–Tuncurry	227.2	0.011	31.2	1	0
27	Grafton	174.7	0.005	46.2	0	1
28	Griffith	322.5	0.001	44.4	0	1
29	Kempsey	312.7	0.003	25.8	0	1
30	Kiama	83.1	0.068	19.4	1	1
31	Kurri Kurri	113.6	0.011	10.0	0	1
32	Lithgow	90.1	0.029	33.3	0	1
33	Morisset–Cooranbong	95.2	0.074	4.5	0	1
34	Mudgee	186.7	0.004	82.7	0	1

	City name	Distance to capital cities (km)	JTW to capital cities (%)	Distance to nearest regional city (km)	Coastal city (yes = 1; no=0)	Rail access (yes = 1; no=0)
35	Muswellbrook	158.3	0.004	40.4	0	1
36	Nelson Bay	162.2	0.025	6.3	1	0
37	Raymond Terrace	135.0	0.003	10.1	0	0
38	Singleton	131.3	0.006	33.5	0	1
39	Sanctuary Point	129.4	0.024	20.4	0	0
40	Taree	247.2	0.002	30.4	0	1
41	Ulladulla	136.8	0.022	29.9	1	0
42	Alstonville	87.8	0.006	12.2	0	0
43	Anna Bay–Boat Harbour	154.4	0.003	6.2	1	0
44	Byron Bay	73.2	0.013	16.5	1	1
45	Camden Haven	288.9	0.008	19.4	1	0
46	Casino	96.0	0.002	25.8	0	1
47	Cooma	91.4	0.046	85.9	0	1
48	Cootamundra	129.2	0.004	42.8	0	1
49	Corowa	229.2	0.000	36.2	0	1
50	Cowra	152.8	0.002	61.0	0	1
51	Deniliquin	236.7	0.004	62.1	0	1
52	Forbes	223.1	0.003	28.3	0	1
53	Glen Innes	241.0	0.002	60.3	0	1
54	Gunnedah	293.8	0.001	68.6	0	1
55	Helensburgh	34.2	0.619	32.7	0	1
56	Inverell	286.8	0.002	61.5	0	0
57	Leeton	280.5	0.005	44.6	0	1
58	Lennox Head	86.2	0.006	7.2	1	0
59	Medowie	140.8	0.009	12.9	0	0
60	Merimbula	177.3	0.005	101.3	1	0
61	Moree	373.9	0.003	87.8	0	1
62	Moss Vale	91.8	0.081	9.6	0	1
63	Murwillumbah	36.6	0.092	18.8	0	1
64	Nambucca Heads	270.1	0.007	25.8	1	0
65	Narrabri	371.1	0.002	78.8	0	1
66	Parkes	236.9	0.003	30.0	0	1
67	Pottsville	47.6	0.136	16.9	1	0
68	South West Rocks	293.8	0.000	23.8	1	0

	City name	Distance to capital cities (km)	JTW to capital cities (%)	Distance to nearest regional city (km)	Coastal city (yes = 1; no=0)	Rail access (yes = 1; no=0)
69	Summerland Point–Gwandalan	93.7	0.097	11.1	0	0
70	Tumut	88.1	0.003	70.3	0	1
71	Wauchope	297.3	0.003	15.6	0	1
72	Yamba	148.2	0.002	50.4	1	0
73	Yass	50.7	0.363	50.7	0	0
74	Young	129.0	0.004	43.4	0	1
75	Geelong	79.7	0.122	31.1	1	1
76	Wodonga	237.9	0.006	12.6	0	1
77	Ballarat	132.2	0.045	50.9	0	1
78	Bendigo	140.8	0.017	33.6	0	1
79	Melton	54.6	0.614	15.3	0	1
80	Mildura	364.4	0.003	177.6	0	1
81	Shepparton	152.7	0.009	31.8	0	1
82	Sunbury	50.4	0.617	14.6	0	1
83	Traralgon	142.6	0.015	5.4	0	1
84	Warrnambool	262.7	0.007	78.8	1	1
85	Bacchus Marsh	68.2	0.439	12.8	0	1
86	Bairnsdale	253.5	0.008	38.3	0	1
87	Colac	158.3	0.007	75.3	0	1
88	Drouin	81.5	0.284	8.1	0	1
89	Drysdale–Clifton Springs	58.2	0.082	8.9	1	1
90	Echuca -	180.5	0.008	4.0	0	1
91	Horsham	310.5	0.003	66.0	0	1
92	Lara	68.3	0.310	14.4	0	1
93	Leopold	68.8	0.077	10.3	0	1
94	Moe–Newborough	125.3	0.035	13.2	0	1
95	Morwell	136.9	0.026	12.5	0	1
96	Ocean Grove–Barwon Heads	65.5	0.117	10.4	1	1
97	Portland (Vic)	348.7	0.005	77.5	1	1
98	Sale	201.6	0.008	56.0	0	1
99	Swan Hill	296.8	0.002	138.9	0	1
100	Torquay–Jan Juc	84.8	0.140	14.4	1	0
101	Wangaratta	198.0	0.007	33.7	0	1
102	Warragul	88.0	0.122	8.3	0	1

	City name	Distance to capital cities (km)	JTW to capital cities (%)	Distance to nearest regional city (km)	Coastal city (yes = 1; no=0)	Rail access (yes = 1; no=0)
103	Ararat	223.7	0.007	27.2	0	1
104	Benalla	160.8	0.014	39.5	0	1
105	Castlemaine	119.5	0.093	32.8	0	1
106	Cobram	206.1	0.004	34.6	0	1
107	Gisborne	63.2	0.483	15.3	0	1
108	Hamilton	306.7	0.003	74.2	0	1
109	Healesville	51.4	0.491	51.4	0	1
110	Kilmore	61.5	0.387	11.6	0	1
111	Kyabram	157.6	0.002	35.0	0	1
112	Lakes Entrance	277.8	0.008	40.3	1	0
113	Leongatha	105.3	0.037	27.1	0	1
114	Maryborough (Vic)	158.4	0.010	48.2	0	1
115	Portarlington	49.4	0.128	8.9	1	0
116	Seymour	87.3	0.072	33.4	0	1
117	Stawell	247.6	0.004	29.8	0	1
118	Wallan	48.6	0.644	12.6	0	0
119	Wonthaggi	88.8	0.111	12.4	0	1
120	Yarrawonga	210.7	0.004	35.4	0	1
121	Cairns	1285.0	0.004	22.0	1	1
122	Sunshine Coast	79.4	0.056	7.3	1	0
123	Toowoomba	108.8	0.013	19.2	0	1
124	Townsville	1028.4	0.006	68.5	1	1
125	Bundaberg	267.4	0.003	9.0	0	1
126	Hervey Bay	220.9	0.007	25.9	1	0
127	Mackay	745.1	0.006	92.6	1	1
128	Rockhampton	480.0	0.013	12.6	0	1
129	Gladstone	393.1	0.004	1.8	1	1
130	Maryborough (Qld)	195.8	0.008	26.4	0	1
131	Bargara–Innes Park	268.5	0.005	15.8	1	1
132	Bongaree–Woorim	44.7	0.413	7.0	1	0
133	Dalby	176.8	0.007	73.4	0	1
134	Emerald	627.6	0.003	150.7	0	1
135	Gracemere	477.0	0.012	12.1	0	1
136	Gympie	134.3	0.009	54.3	0	1

	City name	Distance to capital cities (km)	JTW to capital cities (%)	Distance to nearest regional city (km)	Coastal city (yes = 1; no=0)	Rail access (yes = 1; no=0)
137	Kingaroy	149.8	0.004	83.9	0	1
138	Mount Isa	1192.1	0.003	636.9	0	1
139	Nambour	84.8	0.030	9.7	0	1
140	Warwick	122.5	0.006	64.9	0	1
141	Yeppoon	491.9	0.009	33.2	1	1
142	Airlie Beach	838.4	0.006	54.1	1	0
143	Atherton	1268.6	0.000	26.2	0	1
144	Ayr	967.1	0.004	74.0	0	1
145	Beaudesert	34.8	0.195	16.5	0	1
146	Beerwah	62.3	0.152	22.1	0	1
147	Biloela	397.2	0.003	90.7	0	1
148	Bowen	885.6	0.002	56.1	1	1
149	Charters Towers	999.7	0.008	95.7	0	1
150	Chinchilla	249.6	0.004	76.5	0	1
151	Gatton	73.9	0.054	34.8	0	1
152	Goondiwindi	294.1	0.005	104.2	0	1
153	Gordonvale	1265.5	0.004	20.2	0	1
154	Highfields	106.3	0.016	11.5	0	0
155	Innisfail	1214.4	0.002	49.9	0	1
156	Jimboomba West	33.7	0.591	18.1	0	0
157	Mareeba	1291.4	0.000	25.2	0	1
158	Moranbah	741.1	0.006	146.2	0	1
159	Mount Cotton	29.4	0.751	29.4	0	0
160	Roma	428.2	0.023	181.3	0	1
161	Sandstone Point	39.4	0.552	7.2	1	0
162	Tamborine Mountain	14.1	0.274	14.1	0	0
163	Tannum Sands–Boyne Island	389.1	0.007	13.4	1	0
164	Gawler	36.1	0.530	28.4	0	1
165	Mount Gambier	363.7	0.012	84.5	0	1
166	Whyalla	217.0	0.008	51.3	0	0
167	Crafers–Bridgewater	14.7	0.620	14.7	0	1
168	Mount Barker (SA)	31.7	0.406	15.0	0	1
169	Murray Bridge	71.9	0.058	40.0	0	1
170	Port Augusta	258.0	0.011	60.3	0	1

	City name	Distance to capital cities (km)	JTW to capital cities (%)	Distance to nearest regional city (km)	Coastal city (yes = 1; no=0)	Rail access (yes = 1; no=0)
171	Port Lincoln	275.4	0.005	238.1	1	1
172	Port Pirie	184.0	0.011	48.6	0	1
173	Victor Harbor	61.7	0.112	12.2	1	1
174	Goolwa	63.2	0.123	19.3	1	1
175	Naracoorte	298.0	0.005	87.0	0	1
176	Nuriootpa	59.8	0.086	28.0	0	1
177	Strathalbyn	45.8	0.201	20.3	0	1
178	Bunbury	122.6	0.016	43.1	1	1
179	Albany	359.8	0.007	240.1	1	1
180	Busselton	173.1	0.020	19.8	1	1
181	Geraldton	350.2	0.008	295.9	1	1
182	Kalgoorlie–Boulder	576.0	0.010	307.8	0	1
183	Broome	1031.9	0.004	431.9	1	0
184	Esperance	630.6	0.005	310.8	1	1
185	Karratha	1132.1	0.012	185.9	1	1
186	Port Hedland	1197.5	0.021	181.0	1	1
187	Collie	134.2	0.014	48.1	0	1
188	Dunsborough	175.0	0.031	23.2	1	0
189	Margaret River	206.6	0.020	34.0	0	1
190	Northam	87.7	0.144	87.7	0	1
191	Launceston	142.9	0.006	82.2	0	1
192	Devonport	193.7	0.006	17.6	0	1
193	Burnie–Somerset	228.4	0.003	19.3	0	1
194	Ulverstone	203.1	0.002	14.1	0	1
195	New Norfolk	28.2	0.551	28.2	0	1
196	Wynyard	245.0	0.004	17.6	0	1
197	Alice Springs	1160.6	0.004	637.2	0	1
198	Katherine	241.3	0.007	241.3	0	0

Source: ABS census data, authors' calculations.

Table A4: Key demographic variables of regional cities

	City name	Population size (count)	Weekly income ($)	Age18-65 (%)	Age>65 (%)	University education (%)	(% of employed labour force)				Coupled family
							Work full-time	Prof-e	Service worker	Blue-collar	
1	Queanbeyan	36347	1148.9	0.632	0.114	0.176	0.734	0.339	0.397	0.264	0.499
2	Central Coast	307740	868.2	0.545	0.21	0.119	0.627	0.304	0.374	0.322	0.507
3	Tweed Heads	59780	783.7	0.509	0.283	0.107	0.566	0.279	0.396	0.325	0.459
4	Newcastle	322279	926.5	0.582	0.182	0.164	0.625	0.345	0.359	0.296	0.513
5	Wollongong	261897	887.5	0.576	0.176	0.143	0.628	0.314	0.363	0.323	0.524
6	Albury	47971	858	0.57	0.181	0.133	0.628	0.307	0.37	0.322	0.464
7	Maitland (NSW)	78019	909	0.573	0.148	0.102	0.651	0.26	0.35	0.39	0.553
8	Armidale	20391	845.6	0.569	0.161	0.243	0.606	0.379	0.363	0.258	0.449
9	Bathurst	33581	896.9	0.567	0.16	0.136	0.654	0.303	0.37	0.327	0.486
10	Blue Mountains	29320	905	0.562	0.212	0.235	0.576	0.402	0.338	0.261	0.473
11	Bowral–Mittagong	21397	973	0.469	0.309	0.199	0.597	0.401	0.327	0.271	0.549
12	Cessnock	21723	775.8	0.563	0.179	0.049	0.613	0.198	0.351	0.451	0.455
13	Coffs Harbour	48221	799.8	0.542	0.215	0.143	0.586	0.314	0.382	0.304	0.477
14	Dubbo	34335	902.6	0.568	0.157	0.125	0.7	0.296	0.384	0.319	0.474
15	Goulburn	22416	856.3	0.567	0.192	0.09	0.659	0.252	0.399	0.35	0.465
16	Lismore	27570	736.3	0.568	0.191	0.135	0.585	0.281	0.39	0.329	0.398
17	Nowra–Bomaderry	30856	789.4	0.553	0.195	0.104	0.611	0.268	0.38	0.352	0.479
18	Orange	37181	929.5	0.555	0.167	0.142	0.675	0.322	0.351	0.327	0.484
19	Port Macquarie	44811	819.2	0.499	0.277	0.128	0.599	0.332	0.389	0.28	0.483
20	Tamworth	33882	853.2	0.552	0.178	0.125	0.674	0.294	0.345	0.361	0.457
21	Wagga Wagga	48263	910.5	0.573	0.156	0.154	0.673	0.314	0.371	0.315	0.497
22	Ballina	16502	768.2	0.504	0.318	0.128	0.564	0.302	0.375	0.323	0.413
23	Batemans Bay	11294	719.7	0.487	0.314	0.143	0.54	0.263	0.41	0.327	0.473
24	Broken Hill	17589	826.5	0.562	0.218	0.072	0.66	0.26	0.369	0.37	0.413
25	Moama	5621	831.2	0.484	0.289	0.102	0.65	0.338	0.346	0.315	0.546
26	Forster–Tuncurry	19918	683.1	0.447	0.376	0.083	0.539	0.28	0.399	0.321	0.44
27	Grafton	16790	722.3	0.521	0.23	0.083	0.602	0.249	0.415	0.336	0.434
28	Griffith	18878	861.7	0.564	0.169	0.088	0.69	0.272	0.321	0.406	0.508
29	Kempsey	10649	655.9	0.531	0.211	0.073	0.561	0.222	0.407	0.371	0.412
30	Kiama	13455	977.7	0.542	0.236	0.197	0.611	0.385	0.334	0.28	0.597
31	Kurri Kurri	16790	770.9	0.568	0.162	0.044	0.633	0.165	0.343	0.492	0.494
32	Lithgow	11532	800.2	0.547	0.229	0.076	0.626	0.208	0.364	0.428	0.423
33	Morisset–Cooranbong	18741	814.6	0.522	0.248	0.147	0.618	0.283	0.34	0.377	0.551

	City name	Population size (count)	Weekly income ($)	Age18-65 (%)	Age>65 (%)	University education (%)	(% of employed labour force) Work full-time	Prof-e	Service worker	Blue-collar	Coupled family
34	Mudgee	10964	952.5	0.551	0.173	0.106	0.659	0.263	0.318	0.42	0.481
35	Muswellbrook	10405	987.5	0.591	0.121	0.073	0.689	0.191	0.288	0.521	0.47
36	Nelson Bay	13967	826.5	0.482	0.318	0.173	0.576	0.295	0.383	0.321	0.512
37	Raymond Terrace	13301	772	0.57	0.161	0.057	0.63	0.192	0.36	0.448	0.436
38	Singleton	13217	1064.5	0.59	0.12	0.099	0.683	0.216	0.33	0.454	0.535
39	Sanctuary Point	10141	670.6	0.486	0.291	0.081	0.574	0.218	0.403	0.379	0.497
40	Taree	18114	663.7	0.504	0.257	0.074	0.575	0.254	0.39	0.356	0.436
41	Ulladulla	13057	708.5	0.487	0.309	0.118	0.528	0.282	0.381	0.337	0.507
42	Alstonville	5064	853.1	0.529	0.222	0.528	0.58	0.377	0.33	0.293	0.554
43	Anna Bay	5056	814.9	0.53	0.231	0.113	0.591	0.279	0.357	0.364	0.521
44	Byron Bay	9246	912.4	0.657	0.156	0.228	0.496	0.423	0.321	0.256	0.341
45	Camden Haven	7534	714.3	0.468	0.338	0.213	0.563	0.285	0.361	0.354	0.531
46	Casino	9984	675.6	0.5	0.229	0.062	0.58	0.197	0.354	0.449	0.45
47	Cooma	6379	824.7	0.552	0.23	0.111	0.628	0.288	0.385	0.326	0.44
48	Cootamundra	5671	764.6	0.502	0.278	0.1	0.645	0.301	0.308	0.391	0.506
49	Corowa	5333	783.6	0.499	0.28	0.073	0.627	0.235	0.31	0.455	0.495
50	Cowra	8228	730.5	0.51	0.253	0.078	0.622	0.272	0.354	0.374	0.458
51	Deniliquin	6836	800.8	0.538	0.236	0.088	0.632	0.275	0.355	0.37	0.434
52	Forbes	7033	795.8	0.514	0.222	0.112	0.681	0.339	0.298	0.363	0.486
53	Glen Innes	5164	684.2	0.517	0.258	0.127	0.613	0.35	0.323	0.327	0.456
54	Gunnedah	7985	912.6	0.534	0.197	0.093	0.681	0.26	0.309	0.431	0.485
55	Helensburgh	6076	1131.9	0.595	0.117	0.257	0.643	0.358	0.346	0.296	0.685
56	Inverell	9548	742.8	0.512	0.222	0.091	0.623	0.267	0.354	0.379	0.463
57	Leeton	6928	820.5	0.524	0.184	0.112	0.705	0.286	0.278	0.435	0.499
58	Lennox Head	6095	994.6	0.572	0.166	0.287	0.549	0.424	0.34	0.235	0.574
59	Medowie	8995	907.2	0.573	0.154	0.121	0.648	0.254	0.361	0.385	0.604
60	Merimbula	7520	771.3	0.497	0.318	0.184	0.562	0.294	0.375	0.332	0.497
61	Moree	7384	890	0.563	0.172	0.089	0.727	0.297	0.353	0.351	0.385
62	Moss Vale	7861	875.7	0.522	0.22	0.168	0.629	0.28	0.337	0.383	0.514
63	Murwillumbah	9245	731.1	0.554	0.207	0.231	0.557	0.301	0.332	0.367	0.472
64	Nambucca Heads	6315	632.9	0.465	0.349	0.078	0.527	0.261	0.36	0.379	0.371
65	Narrabri	5901	888.3	0.553	0.175	0.102	0.679	0.269	0.32	0.411	0.478
66	Parkes	9964	846.5	0.531	0.19	0.083	0.666	0.275	0.346	0.379	0.467
67	Pottsville	6550	806.1	0.549	0.189	0.256	0.56	0.31	0.345	0.345	0.53

	City name	Population size (count)	Weekly income ($)	Age18-65 (%)	Age>65 (%)	University education (%)	(% of employed labour force) Work full-time	Prof-e	Service worker	Blue-collar	Coupled family
68	South West Rocks	5004	695.2	0.47	0.356	0.082	0.578	0.27	0.373	0.356	0.463
69	Summerland Point	5765	788.5	0.538	0.222	0.064	0.642	0.201	0.384	0.415	0.563
70	Tumut	6157	823.3	0.532	0.22	0.077	0.646	0.235	0.313	0.452	0.468
71	Wauchope	6879	754.3	0.511	0.222	0.133	0.611	0.259	0.381	0.359	0.539
72	Yamba	6043	685	0.483	0.329	0.265	0.534	0.294	0.354	0.352	0.461
73	Yass	5465	970.4	0.539	0.199	0.156	0.666	0.317	0.377	0.306	0.531
74	Young	7169	742.5	0.51	0.212	0.112	0.617	0.275	0.346	0.379	0.475
75	Geelong	157103	858	0.581	0.18	0.159	0.605	0.322	0.362	0.317	0.477
76	Wodonga	35131	864	0.577	0.149	0.117	0.652	0.273	0.368	0.36	0.506
77	Ballarat	93761	841.2	0.571	0.173	0.164	0.604	0.33	0.365	0.305	0.471
78	Bendigo	92384	829.5	0.568	0.176	0.138	0.604	0.313	0.362	0.325	0.474
79	Melton	54455	829	0.594	0.108	0.089	0.681	0.206	0.39	0.404	0.522
80	Mildura	33445	782	0.558	0.186	0.108	0.64	0.302	0.364	0.334	0.47
81	Shepparton	46194	806.9	0.556	0.174	0.107	0.641	0.306	0.348	0.346	0.482
82	Sunbury	34425	935.8	0.603	0.132	0.135	0.655	0.272	0.402	0.326	0.571
83	Traralgon	25482	936	0.576	0.17	0.117	0.638	0.291	0.364	0.346	0.49
84	Warrnambool	30707	829.7	0.563	0.188	0.141	0.591	0.298	0.357	0.345	0.485
85	Bacchus Marsh	17303	916	0.575	0.15	0.126	0.664	0.273	0.363	0.364	0.56
86	Bairnsdale	12950	755.7	0.519	0.247	0.099	0.586	0.269	0.37	0.361	0.465
87	Colac	11890	759.5	0.541	0.22	0.077	0.597	0.224	0.344	0.432	0.459
88	Drouin	11889	799.7	0.541	0.198	0.122	0.636	0.28	0.31	0.41	0.542
89	Drysdale	12483	814.9	0.529	0.231	0.127	0.585	0.277	0.374	0.349	0.568
90	Echuca	12902	810	0.533	0.223	0.107	0.619	0.282	0.362	0.356	0.503
91	Horsham	15630	816.7	0.546	0.207	0.109	0.616	0.315	0.369	0.316	0.486
92	Lara	13327	927	0.607	0.131	0.14	0.65	0.27	0.365	0.365	0.611
93	Leopold	11882	840	0.55	0.188	0.114	0.609	0.262	0.397	0.342	0.581
94	Moe–Newborough	15062	752.7	0.558	0.217	0.069	0.588	0.2	0.386	0.414	0.418
95	Morwell	13540	714.7	0.557	0.216	0.059	0.591	0.2	0.388	0.412	0.376
96	Ocean Grove	18208	1000.7	0.554	0.175	0.266	0.587	0.4	0.34	0.26	0.594
97	Portland (Vic)	10059	809.6	0.562	0.208	0.084	0.588	0.246	0.311	0.443	0.466
98	Sale	13507	901.5	0.557	0.19	0.129	0.622	0.32	0.344	0.335	0.469
99	Swan Hill	10603	791.9	0.544	0.203	0.09	0.65	0.313	0.354	0.333	0.453
100	Torquay–Jan Juc	16942	1071.3	0.568	0.148	0.249	0.601	0.44	0.331	0.23	0.628
101	Wangaratta	18567	781.9	0.526	0.236	0.11	0.602	0.291	0.374	0.334	0.46

	City name	Population size (count)	Weekly income ($)	Age18-65 (%)	Age>65 (%)	University education (%)	(% of employed labour force) Work full-time	Prof-e	Service worker	Blue-collar	Coupled family
102	Warragul	14274	866.4	0.54	0.206	0.174	0.615	0.337	0.321	0.342	0.538
103	Ararat	6924	761.2	0.569	0.229	0.091	0.617	0.24	0.371	0.389	0.464
104	Benalla	9296	750	0.51	0.279	0.099	0.613	0.283	0.341	0.377	0.443
105	Castlemaine	9933	793.8	0.556	0.245	0.211	0.53	0.386	0.304	0.31	0.427
106	Cobram	5376	748.3	0.5	0.273	0.072	0.658	0.264	0.294	0.442	0.482
107	Gisborne	9822	1089.6	0.554	0.153	0.228	0.631	0.385	0.35	0.265	0.669
108	Hamilton	8892	784.7	0.524	0.244	0.12	0.594	0.304	0.358	0.339	0.49
109	Healesville	8483	861.7	0.561	0.194	0.205	0.604	0.309	0.315	0.375	0.548
110	Kilmore	6953	870.1	0.552	0.17	0.17	0.648	0.247	0.347	0.406	0.538
111	Kyabram	5899	762	0.52	0.232	0.138	0.629	0.31	0.293	0.396	0.529
112	Lakes Entrance	6071	710.7	0.49	0.317	0.146	0.548	0.289	0.37	0.341	0.493
113	Leongatha	5117	820.2	0.522	0.224	0.231	0.59	0.346	0.306	0.349	0.544
114	Maryborough (VIC)	7495	621.2	0.488	0.303	0.062	0.562	0.225	0.361	0.414	0.416
115	Portarlington	6883	730.4	0.479	0.36	0.13	0.553	0.302	0.364	0.335	0.479
116	Seymour	5842	753.4	0.567	0.216	0.068	0.606	0.207	0.366	0.427	0.389
117	Stawell	5521	746.7	0.553	0.236	0.126	0.625	0.283	0.338	0.379	0.463
118	Wallan	8521	929.9	0.607	0.09	0.162	0.681	0.233	0.367	0.4	0.613
119	Wonthaggi	7917	729.3	0.509	0.28	0.294	0.551	0.304	0.341	0.354	0.468
120	Yarrawonga	7847	740.2	0.474	0.305	0.078	0.606	0.267	0.347	0.386	0.504
121	Cairns	144733	929.2	0.609	0.124	0.133	0.659	0.31	0.388	0.303	0.453
122	Sunshine Coast	243377	885.3	0.552	0.213	0.158	0.592	0.32	0.375	0.306	0.521
123	Toowoomba	100032	887.1	0.559	0.176	0.159	0.656	0.311	0.36	0.329	0.485
124	Townsville	168726	950.9	0.607	0.116	0.131	0.684	0.29	0.388	0.321	0.496
125	Bundaberg	50150	724	0.529	0.226	0.078	0.618	0.243	0.37	0.386	0.462
126	Hervey Bay	52075	706.9	0.495	0.282	0.09	0.582	0.286	0.394	0.32	0.478
127	Mackay	75704	1020.8	0.604	0.127	0.102	0.692	0.259	0.322	0.419	0.516
128	Rockhampton	61213	903.1	0.577	0.152	0.111	0.673	0.267	0.363	0.371	0.479
129	Gladstone	33417	1122.4	0.619	0.091	0.1	0.703	0.234	0.302	0.464	0.515
130	Maryborough (QLD)	22205	695.6	0.53	0.233	0.074	0.61	0.23	0.402	0.368	0.47
131	Bargara–Innes Park	11059	823.4	0.524	0.247	0.189	0.638	0.35	0.336	0.314	0.548
132	Bongaree–Woorim	18144	719.6	0.447	0.405	0.091	0.585	0.277	0.384	0.339	0.489
133	Dalby	12005	877.6	0.55	0.154	0.108	0.693	0.296	0.306	0.399	0.523
134	Emerald	13529	1180.4	0.618	0.052	0.093	0.708	0.236	0.31	0.454	0.528
135	Gracemere	10813	929.6	0.58	0.089	0.067	0.686	0.195	0.376	0.429	0.546

	City name	Population size (count)	Weekly income ($)	Age18-65 (%)	Age>65 (%)	University education (%)	(% of employed labour force) Work full-time	Prof-e	Service worker	Blue-collar	Coupled family
136	Gympie	18267	725.3	0.525	0.215	0.079	0.602	0.22	0.377	0.403	0.442
137	Kingaroy	10070	809.7	0.537	0.182	0.085	0.635	0.276	0.335	0.389	0.472
138	Mount Isa	18342	1296.4	0.63	0.07	0.096	0.795	0.239	0.282	0.479	0.464
139	Nambour	18183	769.9	0.553	0.19	0.113	0.592	0.257	0.364	0.38	0.484
140	Warwick	13860	731.2	0.514	0.212	0.083	0.628	0.231	0.347	0.422	0.479
141	Yeppoon	16351	959.7	0.564	0.18	0.125	0.655	0.28	0.348	0.372	0.513
142	Airlie Beach	9334	985.2	0.702	0.085	0.146	0.729	0.273	0.332	0.395	0.405
143	Atherton	6869	778.4	0.52	0.237	0.151	0.613	0.29	0.352	0.358	0.47
144	Ayr	8283	834.1	0.545	0.219	0.076	0.684	0.243	0.313	0.443	0.481
145	Beaudesert	5828	751.2	0.54	0.198	0.148	0.646	0.247	0.319	0.434	0.495
146	Beerwah	5033	803.7	0.557	0.179	0.138	0.601	0.251	0.325	0.424	0.561
147	Biloela	5724	1088.9	0.595	0.11	0.087	0.729	0.208	0.267	0.525	0.508
148	Bowen	8851	842.1	0.576	0.185	0.065	0.686	0.212	0.289	0.499	0.411
149	Charters Towers	8126	830.2	0.508	0.19	0.076	0.658	0.277	0.324	0.398	0.407
150	Chinchilla	5878	967.5	0.561	0.142	0.098	0.681	0.29	0.277	0.433	0.497
151	Gatton	6330	688	0.586	0.166	0.112	0.603	0.225	0.274	0.501	0.443
152	Goondiwindi	5524	922.8	0.559	0.156	0.106	0.693	0.285	0.335	0.379	0.489
153	Gordonvale	5977	906.9	0.568	0.136	0.121	0.67	0.272	0.33	0.398	0.543
154	Highfields	9474	1030.8	0.54	0.155	0.228	0.657	0.375	0.354	0.271	0.72
155	Innisfail	7241	734.2	0.544	0.201	0.094	0.622	0.259	0.309	0.432	0.426
156	Jimboomba West	5552	940.2	0.59	0.082	0.315	0.702	0.222	0.361	0.417	0.645
157	Mareeba	7736	756	0.534	0.213	0.109	0.655	0.249	0.351	0.399	0.458
158	Moranbah	8334	1541.6	0.643	0.018	0.098	0.769	0.214	0.217	0.569	0.54
159	Mount Cotton	5703	1144.9	0.601	0.089	0.208	0.696	0.353	0.348	0.299	0.721
160	Roma	6853	1020.5	0.6	0.117	0.104	0.747	0.283	0.337	0.38	0.466
161	Sandstone Point	9094	750.8	0.511	0.272	0.113	0.623	0.218	0.374	0.409	0.544
162	Tamborine Mountain	7349	902.5	0.56	0.196	0.293	0.606	0.354	0.323	0.323	0.58
163	Tannum Sands	9522	1196.5	0.598	0.091	0.097	0.695	0.249	0.287	0.464	0.596
164	Gawler	26470	841.3	0.566	0.178	0.096	0.626	0.263	0.375	0.362	0.527
165	Mount Gambier	26148	801.8	0.555	0.182	0.085	0.623	0.25	0.37	0.38	0.49
166	Whyalla	21505	857.7	0.576	0.17	0.07	0.641	0.228	0.317	0.454	0.438
167	Crafers–Bridgewater	15127	1152.7	0.562	0.173	0.355	0.591	0.537	0.277	0.185	0.65
168	Mount Barker (SA)	16630	903.2	0.565	0.157	0.143	0.598	0.319	0.386	0.295	0.556
169	Murray Bridge	16803	693.3	0.564	0.202	0.059	0.626	0.18	0.343	0.478	0.466

	City name	Population size (count)	Weekly income ($)	Age18-65 (%)	Age>65 (%)	University education (%)	(% of employed labour force) Work full-time	Prof-e	Service worker	Blue-collar	Coupled family
170	Port Augusta	12894	859.4	0.589	0.164	0.067	0.653	0.237	0.409	0.354	0.431
171	Port Lincoln	14062	837.8	0.565	0.18	0.091	0.585	0.272	0.364	0.364	0.488
172	Port Pirie	13743	738.9	0.542	0.215	0.056	0.596	0.221	0.376	0.403	0.436
173	Victor Harbor	15267	676.2	0.432	0.396	0.098	0.476	0.276	0.389	0.335	0.523
174	Goolwa	7715	676.2	0.451	0.39	0.154	0.48	0.282	0.369	0.349	0.511
175	Naracoorte	5074	807.5	0.559	0.197	0.093	0.643	0.248	0.29	0.461	0.522
176	Nuriootpa	5685	816.6	0.525	0.232	0.093	0.628	0.245	0.31	0.445	0.547
177	Strathalbyn	5488	805	0.518	0.235	0.127	0.583	0.265	0.359	0.376	0.564
178	Bunbury	71094	995.3	0.575	0.15	0.104	0.636	0.25	0.333	0.418	0.544
179	Albany	29369	867.9	0.541	0.21	0.117	0.595	0.273	0.361	0.365	0.515
180	Busselton	25325	890.8	0.527	0.213	0.097	0.579	0.252	0.35	0.398	0.549
181	Geraldton	31978	986.5	0.574	0.147	0.098	0.654	0.269	0.348	0.383	0.506
182	Kalgoorlie–Boulder	29869	1282.9	0.64	0.07	0.093	0.758	0.235	0.283	0.481	0.508
183	Broome	13984	1197.5	0.651	0.066	0.14	0.726	0.345	0.364	0.291	0.354
184	Esperance	10420	962.6	0.557	0.175	0.087	0.638	0.262	0.322	0.416	0.494
185	Karratha	15825	1599.8	0.664	0.022	0.113	0.786	0.262	0.286	0.452	0.521
186	Port Hedland	13828	1609.4	0.681	0.034	0.094	0.805	0.229	0.262	0.509	0.468
187	Collie	7192	959.7	0.567	0.179	0.051	0.632	0.156	0.285	0.559	0.508
188	Dunsborough	6034	1058	0.579	0.156	0.289	0.57	0.358	0.286	0.356	0.605
189	Margaret River	6394	963.6	0.611	0.104	0.233	0.562	0.315	0.305	0.38	0.516
190	Northam	6545	899.1	0.578	0.178	0.11	0.662	0.25	0.342	0.408	0.482
191	Launceston	75328	811.3	0.573	0.182	0.138	0.595	0.318	0.376	0.306	0.454
192	Devonport	23044	738	0.542	0.213	0.081	0.585	0.238	0.375	0.388	0.461
193	Burnie–Somerset	19388	759	0.555	0.194	0.082	0.6	0.245	0.388	0.368	0.458
194	Ulverstone	12032	754.6	0.531	0.24	0.111	0.591	0.268	0.352	0.38	0.504
195	New Norfolk	5834	707.8	0.549	0.2	0.049	0.6	0.163	0.39	0.447	0.475
196	Wynyard	5167	741.8	0.526	0.25	0.087	0.6	0.247	0.356	0.397	0.501
197	Alice Springs	23728	1179.8	0.65	0.082	0.179	0.786	0.371	0.381	0.249	0.431
198	Katherine	6303	1092.6	0.63	0.084	0.162	0.809	0.315	0.364	0.321	0.398

Source: ABS census data, authors' calculations.

Table A5: Housing-market variables of regional cities

	City name	Dwelling density (dwellings per km²)	Ownership rate	Housing sold rate (transacted per year)	Average house sale price ($)	Average weekly rent ($)
1	Queanbeyan	464	0.633	0.064	540073.5	315.7
2	Central Coast	330	0.721	0.083	611413.0	343.3
3	Tweed Heads	328	0.719	0.062	557504.9	345.6
4	Newcastle	395	0.704	0.071	559786.2	325.8
5	Wollongong	376	0.694	0.062	626226.6	323.3
6	Albury	277	0.644	0.079	339209.4	242.0
7	Maitland (NSW)	176	0.700	0.075	431220.5	302.7
8	Armidale	253	0.602	0.073	389534.9	268.4
9	Bathurst	212	0.655	0.091	400564.2	276.1
10	Blue Mountains	143	0.777	0.080	596153.8	326.8
11	Bowral–Mittagong	127	0.791	0.107	896907.2	384.7
12	Cessnock	256	0.647	0.079	311345.6	268.4
13	Coffs Harbour	256	0.663	0.080	480815.6	311.3
14	Dubbo	161	0.644	0.078	365001.6	268.6
15	Goulburn	145	0.663	0.101	368421.1	254.1
16	Lismore	269	0.646	0.071	346121.6	263.0
17	Nowra–Bomaderry	313	0.660	0.092	425901.2	266.8
18	Orange	206	0.649	0.088	368286.4	272.5
19	Port Macquarie	380	0.678	0.088	523580.4	327.0
20	Tamworth	370	0.623	0.084	345126.8	269.1
21	Wagga Wagga	263	0.638	0.085	375193.1	267.5
22	Ballina	481	0.623	0.079	505848.0	316.1
23	Batemans Bay	272	0.702	0.115	435119.0	277.4
24	Broken Hill	284	0.760	0.041	153456.2	197.0
25	Moama	69	0.752	0.067	402727.3	282.0
26	Forster–Tuncurry	253	0.706	0.091	448440.4	273.2
27	Grafton	164	0.661	0.125	308802.8	244.9
28	Griffith	132	0.633	0.070	323076.9	239.7
29	Kempsey	89	0.684	0.064	253809.5	231.7
30	Kiama	371	0.802	0.075	782432.4	395.8
31	Kurri Kurri	228	0.710	0.000	#DIV/0!	274.2
32	Lithgow	193	0.689	0.090	300680.3	227.5
33	Morisset–Cooranbong	163	0.770	0.076	541052.6	321.5

	City name	Dwelling density (dwellings per km^2)	Ownership rate	Housing sold rate (transacted per year)	Average house sale price ($)	Average weekly rent ($)
34	Mudgee	137	0.637	0.089	412820.5	294.5
35	Muswellbrook	351	0.562	0.062	286577.2	242.0
36	Nelson Bay	656	0.707	0.102	597582.0	335.6
37	Raymond Terrace	196	0.599	0.076	360730.6	264.9
38	Singleton	350	0.664	0.055	391542.3	278.4
39	Sanctuary Point	325	0.766	0.109	400468.4	286.5
40	Taree	149	0.648	0.077	293193.7	239.6
41	Ulladulla	223	0.759	0.102	534632.0	285.4
42	Alstonville	1274	0.789	0.045	502415.5	322.4
43	Anna Bay–Boat Harbour	150	0.787	0.058	552222.2	356.7
44	Byron Bay	152	0.634	0.102	1057692.3	503.3
45	Camden Haven	334	0.801	0.070	464864.9	298.1
46	Casino	365	0.666	0.065	268393.8	232.5
47	Cooma	151	0.687	0.076	263157.9	226.4
48	Cootamundra	320	0.760	0.048	239047.6	182.0
49	Corowa	89	0.741	0.051	248148.1	199.7
50	Cowra	140	0.692	0.065	250967.7	201.6
51	Deniliquin	80	0.702	0.056	235135.1	206.2
52	Forbes	164	0.736	0.047	284552.8	174.6
53	Glen Innes	333	0.737	0.037	234831.5	194.0
54	Gunnedah	98	0.648	0.057	347541.0	267.3
55	Helensburgh	592	0.864	0.060	864285.7	466.0
56	Inverell	215	0.650	0.065	284530.4	223.0
57	Leeton	257	0.702	0.051	264705.9	197.9
58	Lennox Head	535	0.771	0.071	781457.0	461.6
59	Medowie	318	0.779	0.054	494565.2	328.8
60	Merimbula	270	0.760	0.083	460674.2	278.1
61	Moree	155	0.575	0.066	244859.8	220.2
62	Moss Vale	253	0.733	0.105	574074.1	321.6
63	Murwillumbah	246	0.748	0.051	419183.7	276.6
64	Nambucca Heads	210	0.638	0.082	351923.1	256.3
65	Narrabri	129	0.669	0.034	346428.6	250.1
66	Parkes	230	0.672	0.064	282822.1	215.7
67	Pottsville	508	0.730	0.064	564220.2	366.8

	City name	Dwelling density (dwellings per km^2)	Ownership rate	Housing sold rate (transacted per year)	Average house sale price ($)	Average weekly rent ($)
68	South West Rocks	177	0.736	0.071	398319.3	291.0
69	Summerland Point–Gwandalan	284	0.801	0.111	507446.8	342.0
70	Tumut	193	0.689	0.065	266019.4	207.4
71	Wauchope	168	0.757	0.074	403286.4	287.3
72	Yamba	745	0.735	0.072	435483.9	298.0
73	Yass	293	0.758	0.071	420491.8	287.2
74	Young	447	0.693	0.071	275806.5	222.4
75	Geelong	332	0.681	0.079	454062.8	275.1
76	Wodonga	243	0.634	0.081	326874.1	255.1
77	Ballarat	222	0.674	0.094	344659.8	249.0
78	Bendigo	195	0.684	0.073	361475.9	251.8
79	Melton	289	0.725	0.080	352138.3	276.9
80	Mildura	333	0.651	0.093	292596.9	231.8
81	Shepparton–Mooroopna	223	0.673	0.068	293986.9	233.6
82	Sunbury	426	0.790	0.068	438646.0	315.0
83	Traralgon	285	0.727	0.072	298828.1	241.4
84	Warrnambool	261	0.682	0.076	355974.8	253.4
85	Bacchus Marsh	336	0.773	0.037	502040.8	259.2
86	Bairnsdale	216	0.697	0.082	288118.8	237.8
87	Colac	196	0.737	0.075	287903.2	222.7
88	Drouin	226	0.764	0.093	353535.4	256.3
89	Drysdale–Clifton Springs	318	0.820	0.083	441087.6	301.4
90	Echuca-Moama	204	0.702	0.077	345000.0	245.6
91	Horsham	153	0.716	0.071	284326.0	221.3
92	Lara	443	0.786	0.072	446540.9	303.2
93	Leopold	633	0.817	0.072	415384.6	317.3
94	Moe–Newborough	294	0.693	0.062	217142.9	179.5
95	Morwell	387	0.653	0.061	199528.3	181.7
96	Ocean Grove–Barwon Heads	179	0.794	0.107	663729.8	340.1
97	Portland (VIC)	132	0.706	0.050	264583.3	206.3
98	Sale	159	0.661	0.090	319018.4	248.6
99	Swan Hill	188	0.659	0.087	287387.4	204.3
100	Torquay	133	0.777	0.103	733887.7	390.3
101	Wangaratta	172	0.705	0.079	303258.1	222.1

	City name	Dwelling density (dwellings per km^2)	Ownership rate	Housing sold rate (transacted per year)	Average house sale price ($)	Average weekly rent ($)
102	Warragul	342	0.780	0.087	373873.9	247.5
103	Ararat	219	0.714	0.066	243165.5	216.7
104	Benalla	162	0.709	0.076	266968.3	205.8
105	Castlemaine	110	0.772	0.080	424489.8	254.8
106	Cobram	257	0.709	0.079	255384.6	211.1
107	Gisborne	171	0.853	0.074	647058.8	350.2
108	Hamilton	142	0.745	0.058	269230.8	199.7
109	Healesville	246	0.827	0.068	561338.3	283.0
110	Kilmore	254	0.780	0.077	367857.1	267.1
111	Kyabram	428	0.771	0.044	264615.4	183.4
112	Lakes Entrance	197	0.762	0.084	369262.3	227.2
113	Leongatha	590	0.804	0.056	327586.2	220.2
114	Maryborough (VIC)	328	0.711	0.074	220359.3	195.6
115	Portarlington	172	0.759	0.144	450151.1	258.2
116	Seymour	194	0.663	0.065	255000.0	196.9
117	Stawell	171	0.750	0.062	219178.1	190.4
118	Wallan	204	0.829	0.076	416129.0	319.2
119	Wonthaggi	577	0.747	0.125	364749.1	238.6
120	Yarrawonga	103	0.735	0.094	364615.4	234.2
121	Cairns	247	0.588	0.087	453171.9	309.1
122	Sunshine Coast	278	0.685	0.086	646131.1	386.5
123	Toowoomba	338	0.631	0.085	412605.8	282.0
124	Townsville	213	0.588	0.064	376802.5	299.2
125	Bundaberg	185	0.646	0.064	284414.0	251.4
126	Hervey Bay	205	0.680	0.092	357823.7	285.8
127	Mackay	184	0.629	0.043	361395.0	278.9
128	Rockhampton	236	0.667	0.055	324306.8	260.4
129	Gladstone	108	0.561	0.046	346052.6	240.2
130	Maryborough (QLD)	205	0.692	0.064	237011.5	229.9
131	Bargara–Innes Park	283	0.733	0.068	392097.3	295.7
132	Bongaree–Woorim	273	0.712	0.078	485057.5	300.0
133	Dalby	40	0.652	0.039	274647.9	222.5
134	Emerald	106	0.543	0.041	275268.8	234.8
135	Gracemere	128	0.569	0.041	336046.5	297.3

	City name	Dwelling density (dwellings per km^2)	Ownership rate	Housing sold rate (transacted per year)	Average house sale price ($)	Average weekly rent ($)
136	Gympie	176	0.629	0.087	287706.9	248.9
137	Kingaroy	69	0.595	0.071	272327.0	236.7
138	Mount Isa	103	0.531	0.037	327027.0	273.5
139	Nambour	307	0.670	0.096	417040.4	300.0
140	Warwick	147	0.643	0.080	283566.4	240.4
141	Yeppoon	154	0.674	0.069	424342.1	307.7
142	Airlie Beach	190	0.553	0.065	480985.9	344.5
143	Atherton	321	0.668	0.070	344791.7	249.2
144	Ayr	161	0.680	0.033	236842.1	218.1
145	Beaudesert	454	0.636	0.076	397757.8	273.7
146	Beerwah	311	0.719	0.091	424309.4	328.0
147	Biloela	140	0.598	0.043	276470.6	246.4
148	Bowen	78	0.604	0.037	300000.0	256.6
149	Charters Towers	69	0.661	0.035	231343.3	206.9
150	Chinchilla	222	0.584	0.048	316666.7	211.7
151	Gatton	284	0.564	0.082	282882.9	275.7
152	Goondiwindi	109	0.632	0.063	352325.6	236.7
153	Gordonvale	181	0.746	0.070	413103.4	259.3
154	Highfields	216	0.840	0.066	545454.5	366.5
155	Innisfail	335	0.565	0.052	258762.9	226.1
156	Jimboomba West	528	0.798	0.092	453211.0	381.5
157	Mareeba	282	0.677	0.054	327464.8	238.9
158	Moranbah	222	0.216	0.075	189631.0	157.4
159	Mount Cotton	377	0.866	0.086	614525.1	431.5
160	Roma	30	0.561	0.038	292000.0	238.2
161	Sandstone Point–Ningi	138	0.726	0.092	416893.7	318.8
162	Tamborine Mountain	132	0.832	0.087	570200.6	370.8
163	Tannum Sands–Boyne Island	60	0.691	0.033	420512.8	287.6
164	Gawler	215	0.726	0.070	354221.4	256.0
165	Mount Gambier	341	0.665	0.059	268408.6	197.7
166	Whyalla	274	0.600	0.017	259770.1	181.9
167	Crafers–Bridgewater	124	0.915	0.061	681547.6	359.6
168	Mount Barker (SA)	279	0.690	0.080	462908.0	299.7
169	Murray Bridge	123	0.611	0.061	264315.4	212.9

	City name	Dwelling density (dwellings per km^2)	Ownership rate	Housing sold rate (transacted per year)	Average house sale price ($)	Average weekly rent ($)
170	Port Augusta	157	0.616	0.022	232835.8	193.0
171	Port Lincoln	141	0.659	0.060	334977.6	226.3
172	Port Pirie	169	0.655	0.030	218518.5	177.6
173	Victor Harbor	232	0.752	0.091	397500.0	248.7
174	Goolwa	101	0.757	0.106	406593.4	241.9
175	Naracoorte	133	0.705	0.059	262766.0	197.9
176	Nuriootpa	282	0.762	0.057	335514.0	250.0
177	Strathalbyn	258	0.770	0.076	376315.8	260.7
178	Bunbury	193	0.708	0.062	408671.6	303.5
179	Albany	127	0.702	0.066	418634.7	270.0
180	Busselton	75	0.702	0.068	509090.9	317.3
181	Geraldton	197	0.680	0.051	360360.4	265.7
182	Kalgoorlie–Boulder	157	0.608	0.073	339261.0	294.8
183	Broome	105	0.532	0.047	509629.6	356.2
184	Esperance	137	0.681	0.052	389115.6	250.8
185	Karratha	38	0.238	0.196	369767.4	300.8
186	Port Hedland	34	0.187	0.177	484848.5	268.7
187	Collie	168	0.774	0.041	254545.5	228.1
188	Dunsborough	166	0.768	0.074	854922.3	351.5
189	Margaret River	264	0.681	0.081	603550.3	339.6
190	Northam	138	0.735	0.044	317500.0	241.8
191	Launceston	306	0.658	0.081	302505.9	234.7
192	Devonport	314	0.664	0.071	261264.0	216.4
193	Burnie–Somerset	261	0.662	0.063	233030.3	204.3
194	Ulverstone	315	0.740	0.058	274683.5	210.2
195	New Norfolk	158	0.698	0.063	236363.6	207.7
196	Wynyard	171	0.699	0.068	255172.4	198.7
197	Alice Springs	100	0.574	0.082	505585.1	326.2
198	Katherine	171	0.510	0.097	376259.0	265.5

Source: ABS census data, authors' calculations.

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