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Understanding what attracts new residents to smaller cities

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

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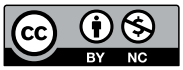

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Acronyms and abbreviations used in this report

AHURI	Australian Housing and Urban Research Institute Limited
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AIC	Akaike Information Criterion
ANZSIC	Australian and New Zealand Standard Industrial Classification
ASGS	Australian Statistical Geography Standard
BIC	Bayesian Information Criterion
CAIC	Consistent Akaike Information Criterion
COVID-19	Coronavirus Disease 2019
GIS	Geographic Information Systems
LCCM	Latent Class Choice Model
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
RUM	Random Utility Maximisation
SA	South Australia
SP	Stated Preference
UCL	Urban Centre and Locality
VIC	Victoria
WA	Western Australia

Executive summary

Key points

- In the next 50 years, Australia's population is predicted to double. Much of this growth is expected to be concentrated in major metropolitan centres that are already struggling to provide the requisite infrastructure needed to support their populations.
- More dispersed population growth strategies could help alleviate some of these urban pressures. However, for these strategies to succeed, the recent decline in regional populations needs to be reversed. In addition, new residents need to be persuaded to move to regional centres.
- Over the period 2011–16, mid-sized urban areas (populations less than 100,000) lost 23,091 more domestic migrants than they attracted. The average mid-sized urban area had a net migration rate of -1.4 per cent over this period, while the average large urban area (populations over 100,000) had a corresponding rate of 0.6 per cent.
- This study examines key drivers of migration flows and settlement patterns across Australia, and identifies key barriers to and opportunities for greater population decentralisation.
- Mid-sized urban areas with high average incomes, low unemployment rates, and easy access to education, arts and recreation services, are more likely to attract and retain migrants, especially those who are young, university-educated and/or international migrants.
- Locational factors, such as access to coastline and distance to nearest metropolitan centre, also have an important impact. For instance, coastal cities that are in close proximity to a major metropolitan centre are more likely to attract both domestic and international migrants.

- **Three-quarters of those surveyed by our study appear open to moving to a mid- sized city under the right circumstances. 21 per cent of survey respondents would be encouraged to move to mid-sized cities if they could offer comparable employment and education opportunities to large-sized cities. 54 per cent of survey respondents view mid-sized cities as excellent places to retire, and would be encouraged to move there if they could obtain support for post retirement living in terms of healthcare and home ownership.**

Key findings

Migration and settlement patterns in Australia are driven by a combination of factors relating to population size, location, economy, amenities and the environment. In general, we find that roughly three-quarters of those surveyed by our study are willing to move to a mid-sized city under the right circumstances. On average, respondents perceive mid-sized cities to offer significantly better quality of life, and large cities to offer better access to employment and education opportunities, and urban amenities.

Population effects

Large cities with populations greater than 100,000 have attracted more domestic and international migrants in recent years than mid-sized cities with populations between 5,000 and 100,000. Over the period 2011–16, the average large city had a net domestic migration rate of 0.6 per cent, while the average mid-sized city had a corresponding rate of -1.4 per cent. Per the 2016 Census, 5.4 per cent of residents in large cities were living overseas five-years ago and are likely international migrants, compared to 2.2 per cent in mid-sized cities. Large cities are especially attractive to young, university-educated individuals that value locational benefits from living in large cities, such as access to retail, food, art and cultural services.

Location effects

Coastal cities are more likely to attract domestic and international migrants. Distance to nearest capital city has a negative impact on domestic migration. Specifically, urban areas in close proximity to a major metropolitan centre are more likely to receive migrants, and most of these migrants are likely to come from the surrounding capital city. For example, in New South Wales, Central Coast, Newcastle and Wollongong have grown at the expense of Sydney, which has consistently lost domestic migrants over the period 2001–16. Coastal mid-sized cities in close proximity to a major metropolitan centre are especially attractive to older adults looking for a place to retire, as these places can offer the quality of life benefits associated with mid-sized cities, and access to healthcare and other services through their nearness to a large centre.

Economic effects

Average incomes have a positive impact on a city's attractiveness to potential migrants, and unemployment rates, housing costs and other living costs have a negative impact. On average, cities with agrarian and industrial economies are considered less attractive. The impacts of employment opportunities is greatest for young and middle-aged individuals that are more likely to be employed full-time in high-income professional and managerial jobs in white-collar sectors, such as information, media and telecommunications. In general, access to employment opportunities is cited as the single most common reason for migration, with 27 per cent of our sample reporting employment as the primary reason for why they live in their current city of residence.

Access to services

Access to pre-school and school education has a positive impact on domestic migration rates for university-educated individuals living in households with children. Similarly, access to tertiary education has a positive effect on attracting young adults. Education is cited as the second most common reason, after employment, for why mid-sized city residents move to large cities. Access to healthcare is important for older adults. Access to arts and recreation services and food and beverage services holds appeal for both young adults and overseas migrants. Access to local public transport and ease of travel are important across all sub-population groups.

Environmental factors

On average, environmental factors such as climate, pollution and incidence of natural disasters are rated as less important than economic factors and access to essential services, such as healthcare. However, environmental factors are rated more important than access to non-essential services, such as food and beverage, and arts and recreation.

Policy development options

This study examined the determinants of migration flows and settlement patterns within Australia. Its objective was to inform government policies seeking to achieve population decentralisation and encourage settlement in mid-sized regional cities. Based on our analysis, there are three broad paths that governments could take.

Develop local employment opportunities in regional centres

Our analysis finds that one in five Australians is open to moving to a mid-sized city if it could offer comparable employment and education opportunities to large cities. These individuals are more likely to be middle-aged and employed full-time in high paying managerial or professional jobs in white-collar sectors. Supporting policies could focus on the creation of local jobs, by offering appropriate incentives to employers to locate in these areas, working with local communities to aid emerging local industries, etc. The widespread adoption of remote working arrangements during the COVID-19 pandemic, and their potential continuation after the pandemic, offers new opportunities for encouraging settlement in mid-sized cities that offer better quality-of-life. “Internal migration resulted in a net loss of 11,200 people from Australia’s capital cities in the September quarter of 2020… At the same time, some regional areas experienced significant growth in house prices as demand for properties increased” (Davies 2021). Policies that support the continuation and potential expansion of remote working arrangements, used in conjunction with policies that offer higher quality-of-life in regional centres, could further help attract these individuals.

However, past government policies that have followed this path have been met with limited success. For example, the Whitlam Government in the 1970s tried to develop regional centres, such as Albury-Wodonga, as suitable sites for population growth and decentralisation, but most of these centres failed to emerge as major population hubs (Beer 2000). Some studies have argued that governments have limited capacity to influence regional economic outcomes (for example Sorensen 2000; 1993). Consequently, the ability of governments to be able to create the kinds of employment opportunities that would attract residents from large cities is questionable. It is possible that COVID-19 could fundamentally alter settlement preferences, but it is too soon to tell how large these shifts are likely to be, and how long they will persist.

Develop higher education institutions in regional centres

Mid-sized urban areas have seen very high out-migration of young adults, i.e. individuals in the age group 18–29 years. On average, these urban areas have had net out-migration rates of 30 per cent for young adults over the period 2011–16, and the trend has been similar over preceding five-year periods. Our analysis finds that these individuals place the greatest importance on employment and education opportunities. They report that policies encouraging relocation to mid-sized cities are most appealing when they support home ownership, ensure high quality of education,

and offer some form of employment security. Our findings confirm that recent policies such as the Job-Ready Graduates Package that invest significantly in higher education in regional Australia could help retain a greater proportion of young adults in mid-sized urban cities. This could in turn create new employment opportunities, and help grow the economies of mid-sized cities in the long-term.

Develop infrastructure for post-retirement living in regional centres

Our analysis finds that roughly one in two Australians view mid-sized cities as excellent places to retire, and would be encouraged to move there if they could get support for post retirement living in terms of healthcare, home ownership and access to other amenities. Our analysis further indicates that coastal cities that are in close proximity to a major metropolitan centre tend to be especially attractive retirement destinations. The ability of mid-sized urban cities to attract older Australians could have significant positive implications for their local economies. "This cohort [of older Australians] will be the most educated, diverse, and wealthy with an unparalleled body of experience and regional areas should seek to develop innovative ways to utilise them for the social and economic sustainability of their communities" (Hugo et al. 2015: 8). Our analysis echoes these findings, and offers evidence in support of policies that seek to develop mid-sized urban cities as retirement destinations as a way of reviving local population growth and regenerating local economic activity.

The study

This study is part of a broader AHURI *Inquiry on growing Australia's smaller cities to better manage population growth*. The Inquiry sets out to answer 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?

This study examines key drivers of migration flows and settlement patterns across Australia, and identifies key barriers to and opportunities for greater population decentralisation. In particular, this study addresses the following research questions:

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?

1. What are the key drivers of mobility in Australia (to/from both metropolitan and regional areas)?
2. Which factors support or motivate moves to smaller cities in regional Australia?
3. What is the role of employment opportunities, infrastructure facilities and other factors in encouraging settlement outside the metropolitan centres?

This study comprises three stages that employ different quantitative methods for data measurement, visualisation and analysis, in an attempt to address the research questions identified previously. Stage 1 uses data visualisation techniques to develop a high-level visual understanding of how migration flows have varied historically across different sub-populations. Stages 2 and 3 use formal techniques for multivariate analysis to identify the primary determinants of the resulting settlement patterns across different sub-populations. In particular, Stage 2 undertakes a macroeconomic analysis of migration patterns. We use migration flow data collected by the Census to examine how migration rates have varied across cities and over time as a function of their local economy, infrastructure and natural environment. Stage 3 develops a microeconomic model of individual preferences for settlement in different urban and regional centres. We use online survey data collected as part of this study from roughly 3,000 demographically and geographically representative Australians in February 2021. Findings from Stage 2 offer a high-level systemic perspective on what drives population migration and settlement. Meanwhile, findings from Stage 3 offer a more nuanced human-level perspective that offers the opportunity for a deeper examination of these same factors. Together, findings from this research project offer a comprehensive perspective on the key determinants of migration flows and settlement patterns within Australia.

1. Introduction

- **In the next 50 years, Australia's population is predicted to double. Much of this growth is expected to be concentrated in major metropolitan centres that are already struggling to provide the requisite infrastructure needed to support their populations.**
- **More dispersed population growth strategies could help alleviate some of these urban pressures. However, for these strategies to succeed, the recent decline in regional populations needs to be reversed, and new residents need to be persuaded to move to regional centres.**
- **This study examines key drivers of migration flows and settlement patterns across Australia, and identifies key barriers to and opportunities for greater population decentralisation.**
- **This Final Report sets out the research framework, methods, key findings, and implications for policy development.**

1.1 Background and policy context

Australia's long-term population growth strategy has prioritised major state capitals as the centres of greatest growth. Between 2016 and 2066, the Australian population is projected to increase by up to 24.6 million people, and approximately 55 per cent of this growth is expected to occur in Australia's two largest cities—Sydney and Melbourne (Australian Bureau of Statistics [ABS] 2018).

The largest Australian cities are already under great strain, as reflected by high levels of road congestion and expensive local housing markets. Sydney and Melbourne together account for roughly 75 per cent of all road congestion across major cities in Australia and New Zealand (Austroads 2016). Average housing costs in these two cities are up to 50 per cent higher than those in other Australian cities and regional centres (ABS 2019).

More dispersed population growth strategies that encourage the development of regional centres could help alleviate some of these urban pressures. For example, Austroads (2016) finds that smaller Australian cities with comparatively lower travel demand typically have higher average traffic speeds, fewer travel delays, and greater travel time reliability. Similarly, Vij, Conor et al. (2021) find that smaller Australian cities have lower home price-to-income ratios and offer more affordable housing options. However, for these strategies to succeed, the recent decline in regional populations needs to be reversed, and new residents need to be persuaded to move to regional centres.

These arguments have typically motivated government policies seeking to encourage greater settlement in mid-sized regional centres. However, consensus around the nature and extent of government intervention in the market process has evolved over time (Beer 2000).

In the 1970s, the Whitlam Government adopted a top-down approach, where a number of 'new cities' were identified as suitable sites for population growth and decentralisation, to relieve pressure off the major metropolitan centres. As part of the strategy, subsidies were offered to larger firms, usually in the manufacturing sector and the branch plants of multinational corporations, to relocate to these regional centres (Collitis 2004; Beer 2000). However, most of these centres failed to emerge as major population hubs, prompting an abandonment of the policy, and a revision in thinking around the role of government in population decentralisation policy making.

Since the 1980s, subsequent Australian governments have favoured a bottom-up approach, where they have worked in partnership with local communities to develop locally driven strategies and objectives that can facilitate 'longer run social and economic growth' (Taylor and Garlick 1989). It is broadly agreed that governments in general have limited ability to influence regional economic outcomes (such as Sorensen 2000; 1993). Consequently, it has been argued that government intervention should be selective, and targeted at regional centres that have the greatest potential for growth (Collitis 2004; Sorensen 2002).

Numerous studies have examined factors impacting the growth of different urban centres (such as Duranton and Puga 2014; Glaeser 2011). In general, studies agree that the primary determinants of migration and settlement patterns include the strength of the local economy, quality of life, climate and natural environment, and social linkages (such as Rodríguez-Pose and Ketterer 2012; Partridge 2010; Haug 2008; Glaeser et al. 2001). However, studies disagree in terms of the salience of these different factors, and this has important implications for government policies seeking to encourage greater settlement in mid-sized regional centres.

Should governments support greater economic growth in regional centres by offering incentives to employers to locate in these areas, supporting emerging local industries, and helping a region identify its comparative economic advantage? Or should governments invest in infrastructure and amenities in these regional centres, to attract potential migrants from metropolitan centres looking for better quality of life? How should these policies differ across different regional centres, and how should they be prioritised? As Collitis (2004: 92) writes, 'these questions are at the core of regional policy, and their answers are far from clear.'

1.2 Research questions

This study examines key drivers of migration flows and settlement patterns across Australia, and identifies key barriers to and opportunities for greater population decentralisation. In particular, this study addresses the following research questions:

1. 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?
2. What are the key drivers of mobility in Australia (to/from both metropolitan and regional areas)?
3. Which factors support or motivate moves to smaller cities in regional Australia?
4. What is the role of employment opportunities, infrastructure facilities and other factors in encouraging settlement outside the metropolitan centres?

Migration flows and settlement patterns are likely to vary across cities and regions as a function of their local economy, infrastructure and natural environment (Argent, Tonts et al. 2014). They are also likely to vary across different sub-populations as a function of their socio-demographic composition, including age, education, employment, household structure and ethnicity (Atkins and Tonts 2016). Our analysis controls for both sets of variables, in an attempt to identify the primary determinants of migration flows and settlement patterns within Australia. Subsequent policy initiatives and instruments can use these findings to encourage more dispersed population growth strategies.

1.3 Research methods

This study comprises three stages that employ different quantitative methods for data measurement, visualisation and analysis, in an attempt to address the research questions identified previously. Table 1 summarises the three stages, their relation to the three research questions, and the methodologies used for addressing each question.

Stage 1 uses data visualisation techniques to develop a high-level visual understanding of how migration flows have varied historically across different sub-populations. Stages 2 and 3 use formal techniques for multivariate analysis to identify the primary determinants of the resulting settlement patterns. In particular, Stage 2 undertakes a macroeconomic analysis of migration patterns, using migration flow data collected by the Census to examine how migration rates have varied across cities and over time as a function of their local economy, infrastructure and natural environment. Stage 3 develops a microeconomic model of individual preferences for settlement in different urban and regional centres, using online survey data collected as part of this study from roughly 3,000 demographically and geographically representative Australians.

Findings from Stage 2 offer a high-level systemic perspectives on what drives population migration and settlement. Findings from Stage 3 offer a more nuanced human-level perspective that offers the opportunity for a deeper examination of these same factors. Together, findings from this research project offer a comprehensive perspective on the key determinants of migration flows and settlement patterns within Australia.

Note that data for Stages 1 and 2 have been sourced from the 2006, 2011 and 2016 Census, and may not capture the effects of COVID-19 on preferences for regional settlement. It is possible that increased adoption of remote working arrangements, greater incidence of state and national border closures, and sustained periods of economic uncertainty as resulting from the pandemic could have a significant impact on future migration patterns. However, existing and emerging evidence seems to be ambiguous on the magnitude and persistence of these effects. For example, in their analysis of these effects, the Commonwealth Centre for Population finds that their 'central projection scenario sees a net shift in migration away from capital cities in favour of regional areas in 2020–21, before gradually returning towards the long-run average' (CP 2021). Therefore, while there have been some immediate shifts in migration patterns, the expectation is that we will return to the status quo in the long-term. Consequently, there is still value in examining migration and settlement trends before the pandemic, as they can offer useful insights on future long-term post-pandemic trends.

Table 1: Research questions, data sources and methodology

Research question	Data sources	Methodology (including data sources)
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?	ABS Census data: 2006, 2011, 2016; for 204 Urban Centres and Localities (UCLs) with populations greater than 5,000 as per the 2016 Census	Data visualisations using GIS and other plotting tools to examine how migration flows have varied historically across different sub-populations.
What are the key drivers of mobility in Australia (to/from both metropolitan and regional areas)?	Same as Stage 1	Spatial regressions to understand how population and sub-population growth has varied across urban centres as a function of macroeconomic place-specific factors.
Which factors support or motivate moves to smaller cities in regional Australia – what is the role of employment opportunities, infrastructure, facilities and other factors in encouraging settlement outside the metropolitan centres?	Online survey of 3,000 demographically and geographically representative Australian households	Stated preference (SP) experiments and analysis of household preferences for settlement in different cities and regions, as a function of both household-specific and place-specific factors.

Source: Author research.

2. Visualisation of migration flows

- **Mid-sized urban areas lost 23,091 more domestic migrants than they attracted over the period 2011–16. The average mid-sized urban area had a net migration rate of -1.4 per cent over this period, while the average large urban area had a corresponding rate of 0.6 per cent.**
- **Among capital cities, Melbourne, Brisbane, Perth and Canberra have consistently had net positive domestic migration rates. Conversely, Sydney, Adelaide, Darwin and Hobart have consistently had net negative domestic migration rates. All capital cities and other large urban areas have attracted disproportionately more international migrants than the national average.**
- **Mid-sized urban areas have seen very high out-migration of young adults (18–29 year olds) and university-educated individuals.**
- **Mid-sized urban areas surrounding capital cities have had net positive domestic migration rates, and most of these migrants have come from the surrounding capital city.**
- **Coastal mid-sized urban areas appear more likely to have attracted domestic migrants than inland mid-sized urban areas, and smaller regional centres with tourism and mining-based local economies have attracted disproportionately more international migrants.**

In this chapter, we develop a high-level visual understanding of migration flows within Australia using data from the Australian census. We use Geographical Information System (GIS) mapping tools to create visualisations of migration rates across different urban areas over time, and how these trends have varied across different sub-populations. This analysis seeks to identify the primary determinants of migration flows. In the following chapter, we examine the relative impact of these different factors through more formal quantitative methods.

2.1 Literature review

Numerous studies over the past decades have examined migration flows and settlement patterns within Australia (such as Bourne et al. 2020; Hugo et al. 2015; Burnley 2001; Hugo et al. 1998; Bell and Newton 1996). There are two recent studies in particular that are very closely related to the analysis undertaken in this chapter, both undertaken by the Regional Australia Institute, and we excerpt key findings from these studies over subsequent paragraphs. The first study was undertaken by Hugo et al. (2015) and used data from the 2011 Census. The second study was undertaken five years later by Bourne et al. (2020) and used data from the 2016 Census.

Contrary perhaps to popular perception, both studies report that more people are moving to mid-sized regional centres from larger capital cities than the other way.

> 'Regional Australia had a net inflow of 65,204 people…in 2006–11 this number was 70,493 people … between 2011 and 2016 more than 1.2 million people either moved to regional Australia or moved around regional Australia from one location to another. So the policy questions are more about how can we understand and amplify the drivers of these movements towards regional Australia, rather than how to make people move' (Bourne et al. 2020: 2).

> 'There is a clear pattern of growth in coastal areas, areas around major regional cities and in mining regions; conversely, areas that have seen population decline tend to be inland. In terms of population growth, there has been a gradual shift away from the south-eastern areas; a function of structural changes in the last 35 years. On the other hand, Western Australia and Queensland have increased their share of the national population. In these states in particular, coastal areas have seen dynamism and growth driven by factors such as the mining boom has profoundly influenced population dynamics' (Hugo et al. 2015: 8).

In terms of demographic factors, regional cities have attracted high proportions of older adults, and are emerging as popular retirement destinations.

> 'The evident growth of older populations (65 plus years) in almost all coastal RDAs [Regional Development Areas], especially in the south and south-east is a pre-cursor of an influx of baby boomers who have demonstrated a proclivity to move to seaside non-metropolitan locations upon retirement. Older Australians are traditionally the least mobile, however, early indications suggest baby boomers will have higher rates of mobility than earlier generations. This is highlighted by the fact that only five RDAs (mainly near capital cities and tourist areas) have high growth of their less than 65 years and low growth rates of their over 65+ years population. There is considerable variation in patterns of ageing between local areas, impacted by both ageing in place and residential mobility. These variations are important to better plan services, communities, infrastructure and support systems for both the current and future generations of older people in regional Australia. A cultural shift on the perceptions of ageing is also required as most discussion has viewed the older population as a challenge or burden. However, this cohort will be the most educated, diverse, and wealthy with an unparalleled body of experience and regional areas should seek to develop innovative ways to utilise them for the social and economic sustainability of their communities' (Hugo et al. 2015: 8)

Conversely, regional cities continue to lose young adults. For example, between 2011 and 2016, Bourne et al. (2020: 2, 26) find that:

> 'more millennials [20-35 year olds] moved into capital cities from regions than vice versa – with a net outflow from regions to [capital] cities of 31,999… Our analysis reaffirmed a key experience with which regional communities are all too familiar; that is, the shifting of their younger demographics to larger metropolitan centres. This 'move to the city' is a well-known migratory pattern and is sometimes characterised as a cultural rite of passage… Sydney was the only [capital] city to see a net outflow of millennial-aged people between 2011 and 2016… All other [capital] cities saw net inflows of millennials, with Brisbane and Melbourne seeing the largest net inflows.'

In the analysis that follows, we revisit these Census datasets. Our findings largely confirm what has been reported by these previous studies. But there are some disagreements as well. Our analysis also contributes new findings, particularly with regards to migration and settlement patterns of sub-populations that haven't received as much attention in the literature, such as university-educated and Indigenous Australians.

2.2 Methodology

We examine migration flows over the period 2001–16 between 204 urban centres and localities (UCLs), as defined by the Australian Statistical Geography Standard, with populations greater than 5,000, as per the 2016 Census. For each pair of UCLs, we examine cross-migration patterns across different sub-population groups. Following the approach taken by previous studies (e.g. Argent, Tonts et al. 2014), data for our analysis is drawn from cross-classified tables of UCL of residence at Census night and five years prior for the 2006, 2011 and 2016 Census'. Therefore, our analysis examines migration patterns over the following three five-year periods: 2001–06, 2006–11 and 2011–16.

The geographical boundaries of UCLs have changed over time. We use the 2016 boundaries to define each UCL in our sample, and we use appropriate correspondences provided by the Australian Statistical Geography Standard to ensure that the same geographic units are being compared over time. We define mid-sized urban areas as having populations between 5,000 and 99,999, and large-sized urban areas as having populations greater than 100,000, as per the 2016 Census. We have 187 mid-sized urban areas and 17 large urban areas in our sample.

We examine patterns of domestic migration for both the general population, and specific sub-populations based on age, gender, education and indigeneity. For a given UCL, sub-population and five-year time period, we measure domestic migration rates as follows:

$$r_{nti} = \frac{1}{p_{nti}} \left(\sum_{j \neq i} m_{ntji} - \sum_{j \neq i} m_{ntij} \right) \quad (1)$$

- r_{nti} is the migration rate for sub-population n and UCL i over the five-year period t;
- p_{nti} is the total number of individuals that belong to sub-population n that were resident in UCL i at the end of the five-year period t; and
- m_{ntjk} is the number of individuals in sub-population n that migrated from UCL j to UCL k over the five-year period t.

The reader should note that $\sum_{j \neq i} m_{ntji}$ and $\sum_{j \neq i} m_{ntij}$ denote in-flows and out-flows, respectively, for sub-population n and UCL i over the five-year period t. In words, we calculate migration rates by taking the difference between in-flow and out-flow to capture net flow, and we normalise the difference by dividing it by sub-population size.

Our analysis also examines settlement trends for overseas migrants. For a given UCL and five-year time period, we measure overseas migration rates as follows:

$$g_{ti} = \frac{b_{ti}}{p_{ti}} \quad (2)$$

- g_{ti} is the overseas migration rate for UCL i over the five-year period t;
- b_{ti} is the number of individuals that lived overseas at the start of the five-year period t, but were resident in UCL i at the end of the five-year period t; and
- p_{ti} is the total number of individuals that were resident in UCL i at the end of the five-year period t.

In words, overseas migration rate is measured in terms of the proportion of existing residents that lived overseas five-years ago.

We report mean and median migration rates for mid-sized urban areas and large urban areas across different sub-populations and time periods in Table 2. Over subsequent sections, we discuss these findings in greater detail. Section 2.3 examines domestic migration rates for the general population. Section 2.4 examines migration rates for international migrants. Sections 2.5 to 2.8 examine domestic migration rates for specific sub-populations, based on age, gender, education and indigeneity.

2.3 Domestic migrants

In this section, we examine internal migratory trends among Australian residents over the three five-year periods: 2001–06, 2006–11 and 2011–16, illustrated in Figure 1, Figure 2 and Figure 3, respectively. For the sake of completeness, we have included maps for each of the three time periods. However, the reader should note that, small differences notwithstanding, the major patterns appear to be the same across all three time periods. In subsequent sections, we will limit our attention primarily to migratory patterns over the period 2011–16, discussing patterns over other time periods only if they offer new and/or different insights.

Table 2: Migration flows across medium and large-sized urban areas in Australia for different sub-population groups over the period 2001–16

		Median flow as a proportion of (sub-)population size		Mean flow as a proportion of (sub-)population size		
Sub-population group	Time period	Large urban areas	Mid-sized urban areas	Large urban areas[c]	Mid-sized urban areas[c]	p-value[b]
Domestic migrants						
All individuals	2001–06	-0.3%	-1.6%	0.4%	-0.3%	0.79
	2006–11	0.6%	-1.6%	0.8%	0.6%	0.94
	2011–16	0.6%	-2.2%	0.9%	-1.4%	0.24
18–29 years	2001-06	0.5%	-29.7%	0.1%	-36.4%	0.00
	2006-11	1.0%	-25.1%	-0.5%	-28.1%	0.00
	2011-16	1.1%	-29.7%	-0.3%	-32.6%	0.00
30–64 years	2001–06	0.3%	-0.7%	0.7%	0.6%	0.99
	2006–11	0.9%	-1.5%	1.0%	0.3%	0.79
	2011–16	0.3%	-2.3%	1.2%	-2.0%	0.14
65+ years	2001–06	0.1%	-1.3%	-1.6%	-5.0%	0.62
	2006–11	0.0%	-1.4%	0.1%	-2.0%	0.40
	2011–16	0.0%	-1.7%	0.3%	-2.9%	0.20
Male	2001–06	-0.2%	-3.3%	0.7%	-2.3%	0.30
	2006–11	1.0%	-3.4%	1.0%	-1.7%	0.30
	2011–16	0.8%	-4.2%	1.1%	-3.6%	0.02
Female	2001–06	-0.1%	-2.5%	0.4%	-2.0%	0.39
	2006–11	0.7%	-2.9%	1.0%	-1.5%	0.33
	2011–16	0.8%	-4.0%	1.0%	-3.4%	0.03
College educated	2001–06	-1.4%	-10.5%	-1.2%	-15.4%	0.13
	2006–11	0.3%	-10.6%	-0.3%	-10.3%	0.01
	2011–16	0.3%	-12.3%	0.2%	-12.7%	0.00
Indigenous Australians	2001–-06	2.6%	-3.0%	0.8%	-19.9%	0.44
	2006–11	2.2%	-3.0%	1.4%	-2.2%	0.33
	2011–16	2.9%	-4.4%	1.9%	-5.4%	0.03
International migrants[a]						
	2001–06	3.8%	1.3%	3.9%	1.6%	0.00
	2006–11	5.5%	1.9%	5.4%	2.4%	0.00
	2011–16	4.9%	1.7%	5.4%	2.2%	0.00

a Flow for international migrants is measured as a proportion of the size of the total population of each UCL at the end of the five-year period.
b Two-sided test with null hypothesis that mean migration flow is same across medium and large-sized urban areas.
c Bolded values indicate the difference between medium and large-sized urban areas is statistically significantly different from zero with a confidence level of 95 per cent.

Source: Author research.

Based on our definitions of large and mid-sized urban cities, we disagree with previous studies (such as Bourne et al. 2020; Hugo et al. 2015) that regional centres have attracted more domestic migrants than metropolitan centres. The disagreement arises from differences in definitions of 'regional centres' and 'metropolitan centres'. Both Bourne et al. (2020) and Hugo et al. (2015) define regional centres as comprising any area outside of the eight capital cities. This includes large urban areas like Gold Coast–Tweed Heads and Newcastle–Maitland, with populations of 624,263 and 463,052, respectively, per the 2016 Census. It is questionable whether such urban areas can be regarded as truly regional, given their large sizes. Our analysis takes a more nuanced approach, where we define regional Australia as comprising mid-sized urban cities with populations under 100,000. Based on our definition, we find that mid-sized urban areas attracted 5,748 and 5,147 more domestic migrants than they lost in 2001–06 and 2006–11, but they lost 23,091 more domestic migrants than they attracted in 2011-16. As shown in Table 2, the average mid-sized urban area had a net migration rate of -1.4 per cent over the period 2011–16. At least in the five-years preceding the last Census in 2016, our analysis does confirm the general belief that regional Australia has lost residents to large urban areas.

There are five major patterns that are worth pointing out. First, among the capital cities, Melbourne, Brisbane, Perth and Canberra have consistently attracted more domestic migrants than they have lost. Conversely, Sydney, Adelaide, Darwin and Hobart have consistently lost more domestic migrants than they have attracted. In fact, and as we examine in more detail in the following section, population growth in these latter cities has largely been due to the settlement of international migrants.

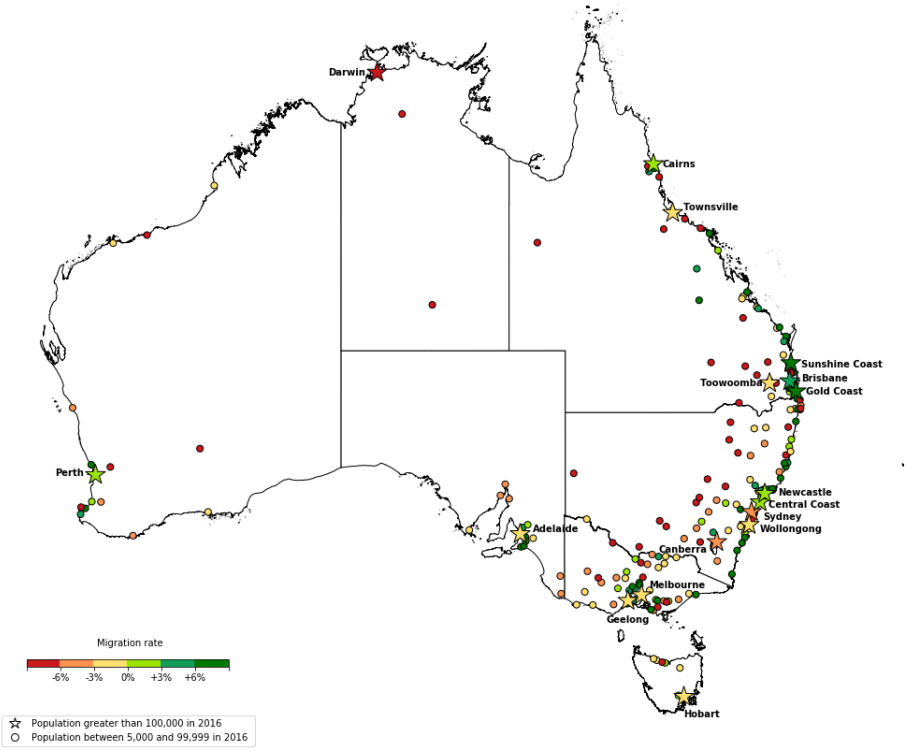
Second, smaller cities surrounding capital cities have attracted more migrants than they have lost, and most of these migrants have come from the surrounding capital city. For example, Central Coast, Newcastle and Wollongong have grown at the expense of Sydney in New South Wales. Similarly, Gawler, Crafers–Bridgewater, Mount Barker, Victor Harbour and Goolwa have grown at the expense of Adelaide in South Australia. Similar patterns are observed for each of the other capital cities.

Third, coastal mid-sized urban areas appear more likely to have grown than inland mid-sized urban areas. In particular, urban areas along the Eastern Seaboard, such as Port Macquarie and Ulladulla, and urban areas south of Perth, such as Busselton and Margaret River, have grown by more than 5 per cent between 2011 and 2016. In each of these cases, domestic migration has been the result of growth in local tourism industries.

Fourth, regional centres that are not on the coastline, nor in close proximity to a large urban area, have steadily lost more migrants than they have attracted. Important exceptions include: Bowral–Mittagong in New South Wales, which has emerged as a retirement destination for older Sydney residents; and Orange and Cessnock in New South Wales, which have benefitted from growth in local wine industries.

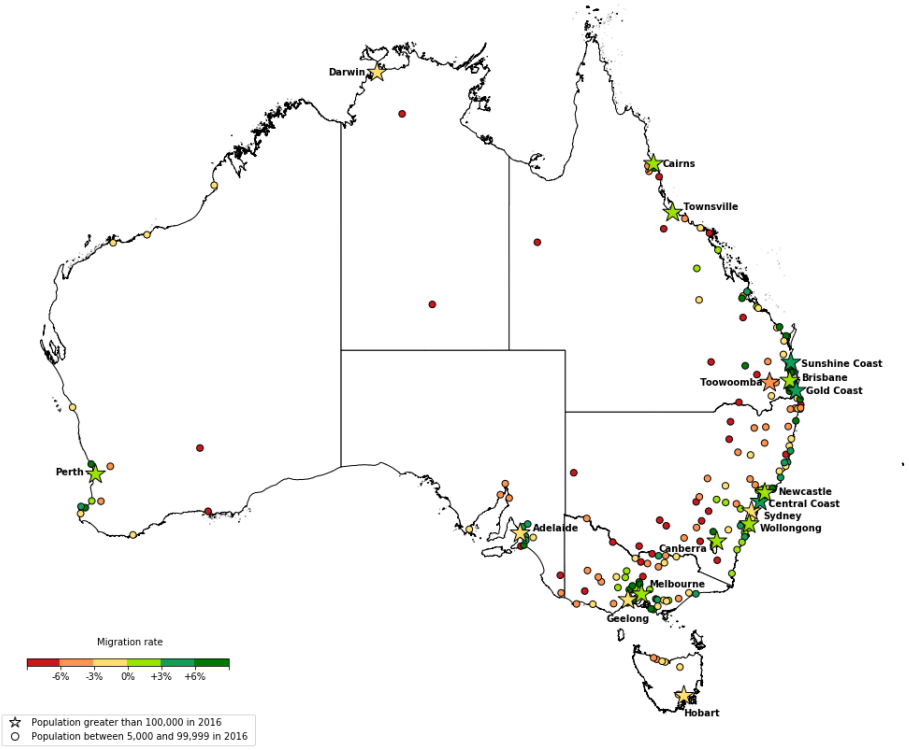
Finally, patterns of migration appear to be strongly influenced by state boundaries. Figure 4 and Figure 5 plot the distribution of domestic migrants from Sydney and Brisbane, respectively. As can readily be observed, migrants from Sydney are most likely to move to urban areas in New South Wales, and migrants from Brisbane are most likely to move to urban areas in Queensland, even after discounting for distances. We observed similar trends across other states; for the sake of brevity, we do not include the corresponding maps here.

Figure 1: Domestic migration rates for the general population across different UCLs over the period 2001–06



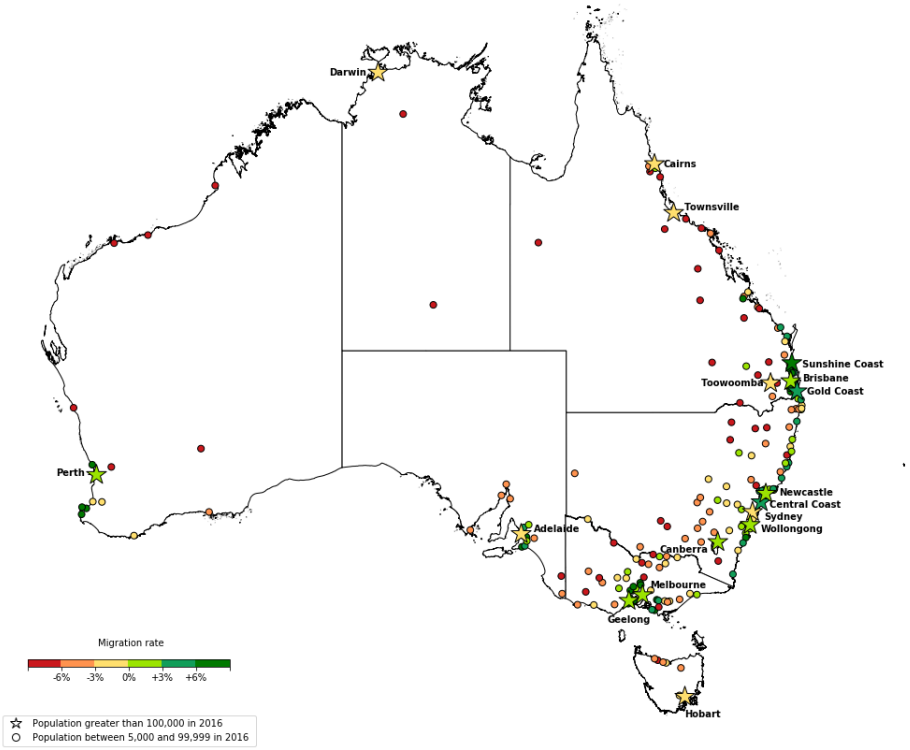
Source: Author research based on data collected by the Australian Census.

Figure 2: Domestic migration rates for the general population across different UCLs over the period 2006–11



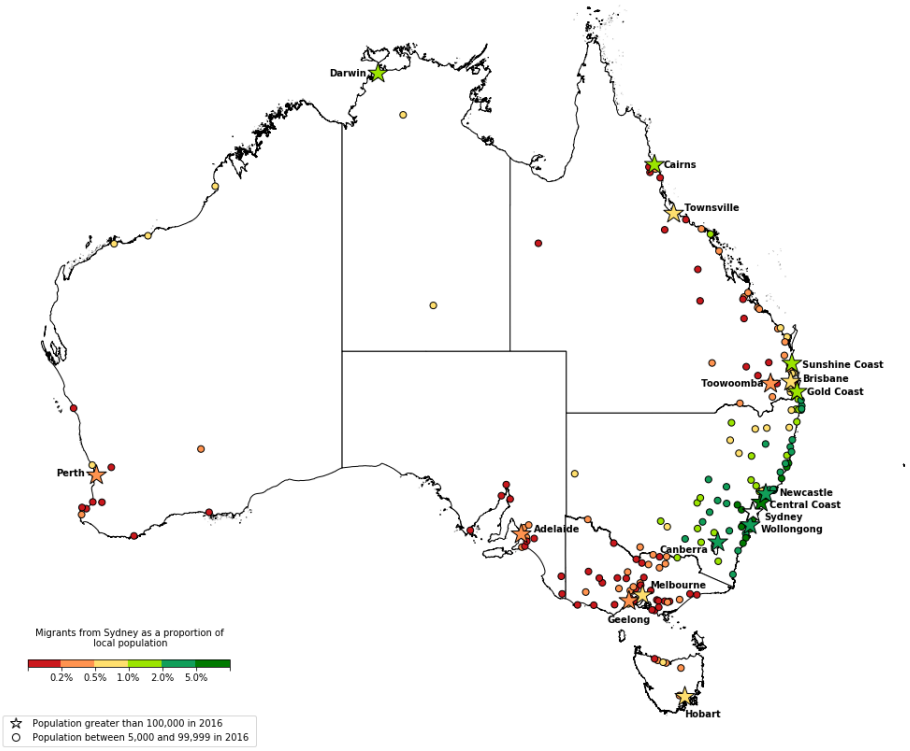
Source: Author research based on data collected by the Australian Census.

Figure 3: Domestic migration rates for the general population across different UCLs over the period 2011–16



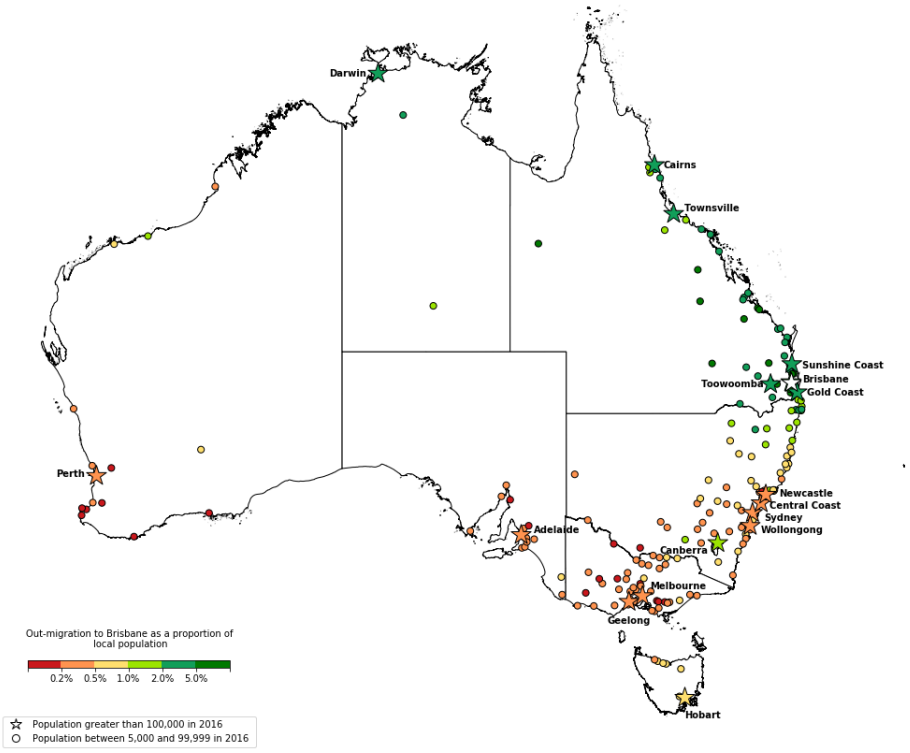
Source: Author research based on data collected by the Australian Census.

Figure 4: Migrants from Sydney to different UCLs over the period 2011–16, as a proportion of their local population in 2016



Source: Author research based on data collected by the Australian Census.

Figure 5: Migrants from Brisbane to different UCLs over the period 2011–16, as a proportion of their local population in 2016



Source: Author research based on data collected by the Australian Census.

2.4 International migrants

In this section, we examine settlement patterns of international migrants in Australia. Table 3 lists the top twenty UCLs in our sample by proportion of 2016 residents that lived overseas in 2011. Figure 7 plots the proportion of residents in each UCL in 2016 that lived overseas in 2011. For reference, 5.9 per cent of the 2016 population in Australia comprised individuals that lived overseas in 2011. We examined settlement patterns of international migrants in previous Census years as well. We did not find any significant differences across time periods. For the sake of brevity, we limit our discussion to the period 2011–16.

There are multiple trends that are worth pointing out. First, capital cities and other large urban areas have attracted disproportionately more international migrants than the national average. These include, in descending order of share, Sydney (9.1%), Darwin (8.8%), Melbourne (8.6%), Perth (8.3%), Canberra–Queanbeyan (7.1%), and Brisbane (6.7%).

Second, smaller regional centres in close vicinity to large urban areas have, in some cases, also attracted disproportionately more international migrants than the national average. For example, Gatton is a regional centre between Brisbane in the east and Toowoomba in the west, which has the greatest proportion of international migrants. Similarly, Yanchep is a small regional centre roughly 55 kilometres north of Perth that also attracted a substantial number of international migrants in the period 2011–16.

Third, smaller regional centres with tourism-based local economies have attracted disproportionately more international migrants. Examples include Alice Springs in the Northern Territory; Narracoorte in South Australia; Margaret River in Western Australia; Airlie Beach–Cannonvale in Queensland; and Byron Bay in New South Wales.

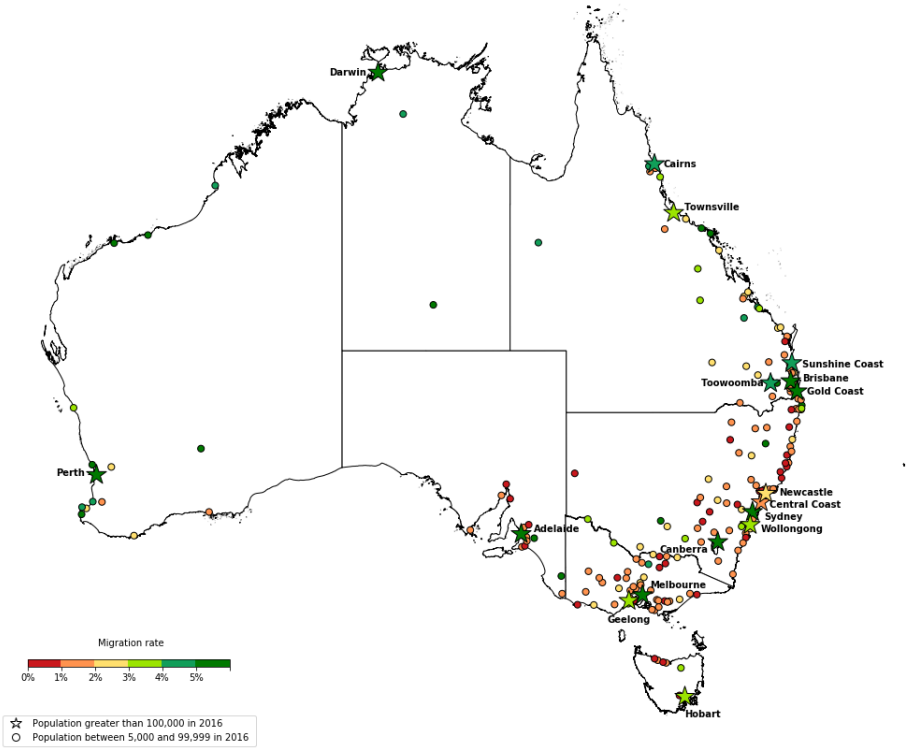
Fourth, smaller regional centres with mining-based local economies have also attracted disproportionately more international migrants. Examples include Karratha, Port Hedland and Kalgoorlie–Boulder, all in Western Australia.

Table 3: Top twenty UCLs in terms of proportion of 2016 residents that lived overseas in 2011

			2016 residents that lived overseas in 2011	
UCL	State	2016 population	Number	Proportion
Gatton	QLD	6,330	886	14.0%
Sydney	NSW	4,321,534	391,520	9.1%
Darwin	NT	118,452	10,411	8.8%
Melbourne	VIC	4,196,201	359,950	8.6%
Alice Springs	NT	23,728	2,022	8.5%
Perth (WA)	WA	1,874,577	155,259	8.3%
Yanchep	WA	8,862	686	7.7%
Naracoorte	SA	5,074	365	7.2%
Canberra–Queanbeyan	ACT	432,141	30,734	7.1%
Margaret River	WA	6,394	437	6.8%
Karratha	WA	15,825	1,062	6.7%
Brisbane	QLD	2,054,616	136,969	6.7%
Port Hedland	WA	13,828	921	6.7%
Kalgoorlie–Boulder	WA	29,869	1,934	6.5%
Byron Bay	NSW	9,246	596	6.4%
Airlie Beach–Cannonvale	QLD	9,334	571	6.1%
Armidale	NSW	20,391	1,212	5.9%
Gold Coast–Tweed Heads	QLD	600,334	35,359	5.9%
Adelaide	SA	1,165,639	67,831	5.8%
Griffith	NSW	18,878	1,054	5.6%

Source: Author research based on data collected by the Australian Census.

Figure 6: Migration rates for overseas migrants across different UCLs over the period 2011–16



Source: Author research based on data collected by the Australian Census.

2.5 Domestic migration across different age groups

In this section, we examine internal migratory trends among Australian residents across three different age groups:

1. 18–29 years
2. 30–64 years
3. 65+ years

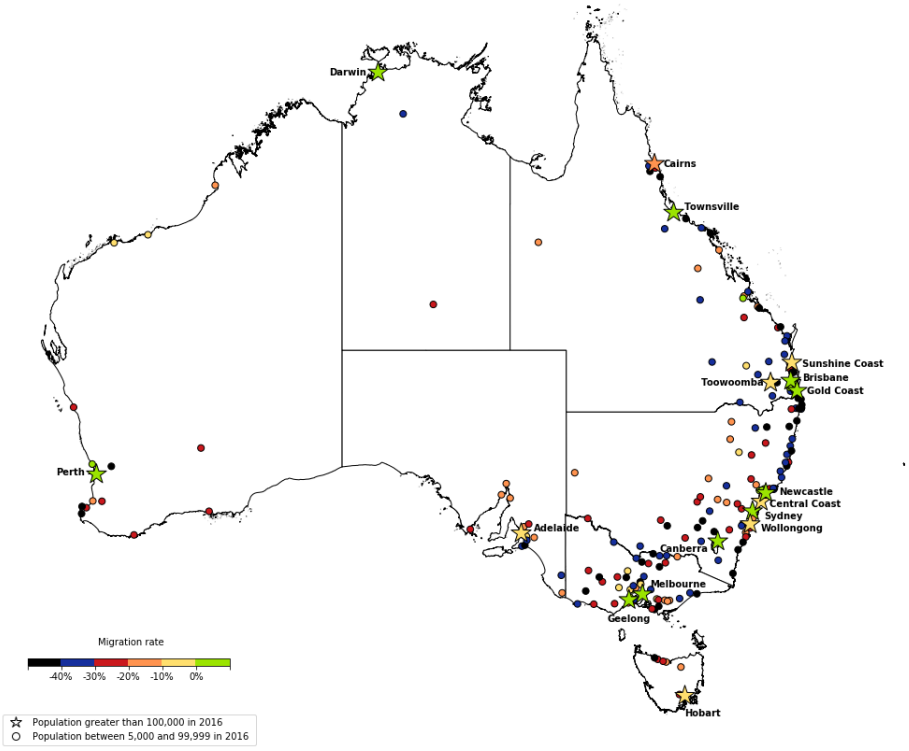
As before, we limit our attention to migratory patterns over the period 2011–16, as we did not find any significant differences over earlier time periods. Figure 7, Figure 8 and Figure 9 plot net migration flows across UCLs for each of the three age groups, respectively.

With regards to individuals in the age group 18–29 years, there has been a dramatic loss across mid-sized urban areas. On average, these urban areas have had net out-migration rates of 30 per cent over the period 2011–16, and the trend has been similar over preceding five-year periods, as noted also in Table 2. Youth out-migration from small regional centres to large urban areas in search of better educational and employment opportunities is an old and well-known phenomenon (such as Argent and Walmsley 2008; Eacott and Sonn 2006; Gabriel 2002). Our our analysis confirms the continuation of these trends over recent years.

With regards to individuals in the age group 30–64 years, migration patterns are not as dramatic. A majority of the larger urban areas have experienced positive net migration. However, multiple mid-sized urban areas have also experienced net in-migration. On average, as noted in Table 2, mid-sized urban areas attracted more such individuals than they lost over the periods 2001–06 and 2006–11, and the trend only reversed in 2011–16. Many of the trends are similar to those discussed for the general population in Section 2.1, and we do not restate them here for the sake of brevity.

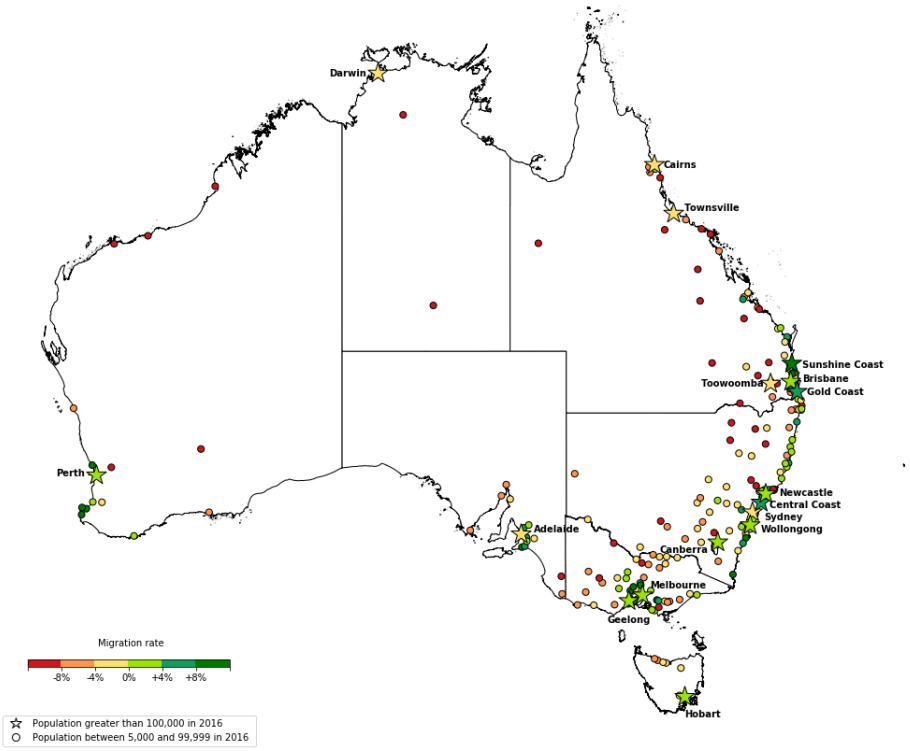
With regards to individuals in the age group 65+ years, on average large urban areas have attracted more such individuals than they have lost, and the converse holds true for mid-sized urban areas. However, the greatest proportional growth has been across coastal mid-sized urban areas that have emerged as popular retirement destinations. These destinations include Ocean Grove—Barwon Heads in Victoria, Busselton in Western Australia, Victor Harbor in South Australia, Sunshine Coast in Queensland, and Central Coast in New South Wales. Table 4 lists the top twenty UCLs in our sample by net migration rate among residents ages 65 years and older over the period 2011–16.

Figure 7: Domestic migration rates for individuals in the age group 18–29 years, as of 2016, across different UCLs over the period 2011–16



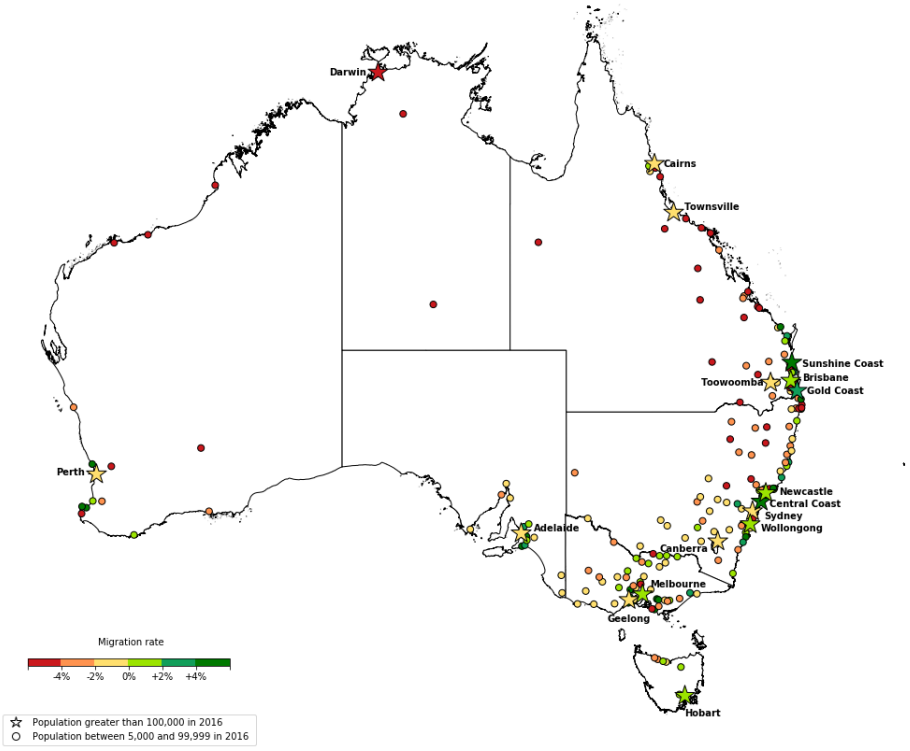
Source: Author research based on data collected by the Australian Census.

Figure 8: Domestic migration rates for individuals in the age group 30-64 years, as of 2016, across different UCLs over the period 2011–16



Source: Author research based on data collected by the Australian Census.

Figure 9: Domestic migration rates for individuals in the age group 65+ years, as of 2016, across different UCLs over the period 2011–16



Source: Author research based on data collected by the Australian Census.

Table 4: Top twenty UCLs in terms of migration rates of individuals in the age group 65+ years as of 2016, over the period 2011–16

UCL	State	Total population in 2016	Population in age group 65+ years in 2016	Net flow over the period 2011–16	Migration rate over the period 2011–16
Yanchep	WA	8,862	724	119	16%
Ocean Grove–Barwon Heads	VIC	18,208	2,674	388	15%
Salamander Bay– Soldiers Point	NSW	5,274	1,350	194	14%
Inverloch	VIC	5,066	803	112	14%
Drouin	VIC	11,889	1,482	160	11%
Busselton	WA	25,325	4,083	400	10%
Leopold	VIC	11,882	1,611	154	10%
Dunsborough	WA	6,034	481	44	9%
Mount Barker	SA	16,630	2,027	178	9%
Lara	VIC	13,327	1,166	87	7%
Bowral–Mittagong	NSW	21,397	5,208	356	7%
Bargara–Innes Park	QLD	11,059	1,623	106	7%
Victor Harbor	SA	15,267	4,881	314	6%
Morisset–Cooranbong	NSW	18,741	3,329	214	6%
Pottsville	NSW	6,550	752	43	6%
Bacchus Marsh	VIC	17,303	1,852	104	6%
Sunshine Coast	QLD	243,377	42,270	2,295	5%
Central Coast	NSW	307,740	54,623	2,955	5%
Torquay–Jan Juc	VIC	16,942	1,889	96	5%
St Georges Basin–Sanctuary Point	NSW	10,141	1,708	85	5%

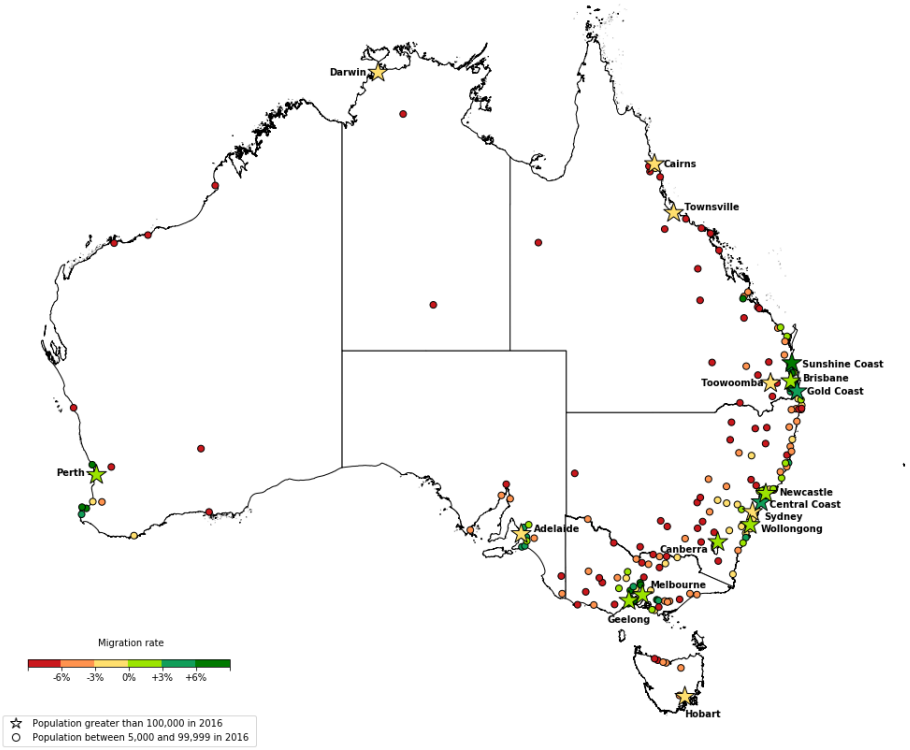
Source: Author research based on data collected by the Australian Census.

2.6 Domestic migration as a function of gender

In this section, we examine internal migratory trends among Australian residents as a function of gender. As before, we limit our attention to migratory patterns over the period 2011–16, as we did not find any significant differences over earlier time periods. Figure 10 and Figure 11 plot migration rates across UCLs for females and males, respectively.

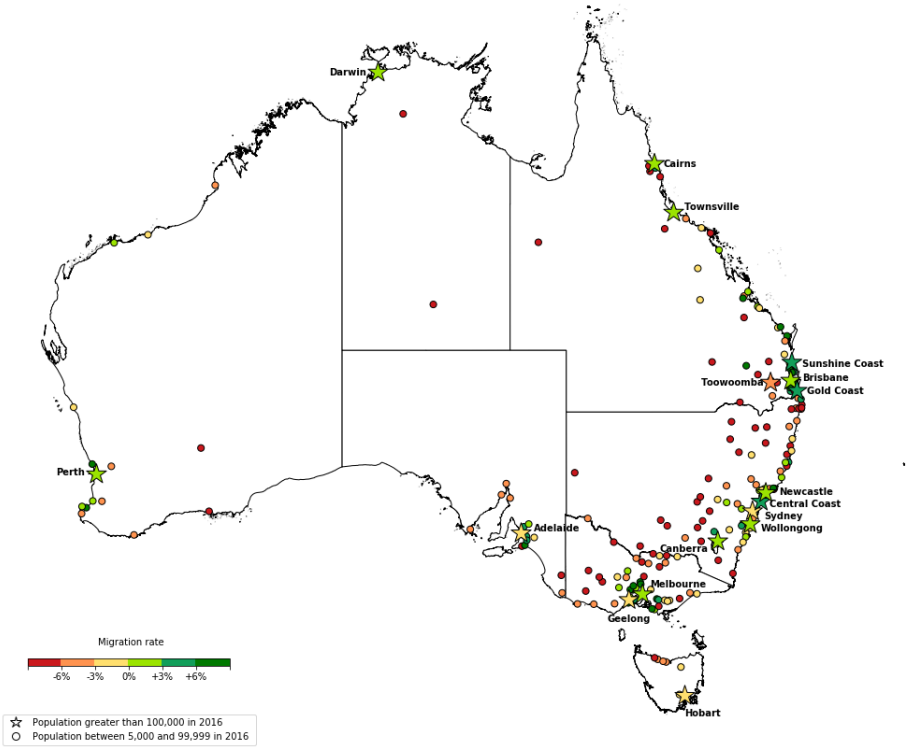
Interestingly, there are no significant discernible visual differences between maps for the two genders. By and large, trends are consistent for both genders with the general population. Previous studies have found that 'females are… more likely to leave rural regions than their male counterparts' (Argent and Walmsley 2008: 141). We did not find any statistically significant difference between migration rates for the two genders across mid-sized urban areas over any of the three five-year observation periods in our sample.

Figure 10: Migration rate for females across different UCLs over the period 2011–16



Source: Author research based on data collected by the Australian Census.

Figure 11: Migration rate for males across different UCLs over the period 2011–16



Source: Author research based on data collected by the Australian Census.

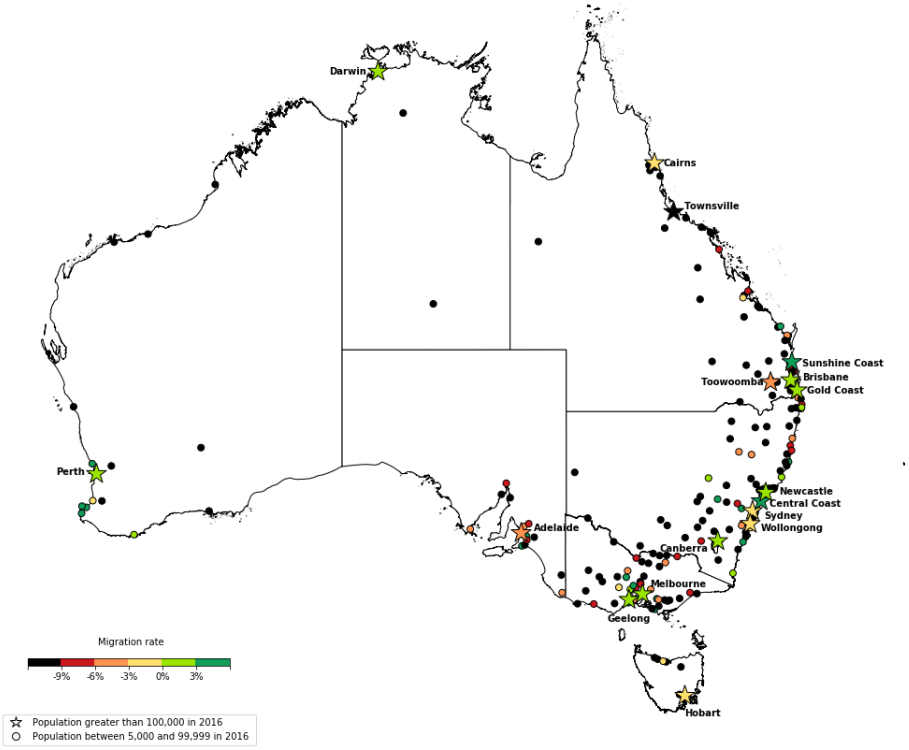
2.7 Domestic migration for university-educated individuals

In this section, we examine internal migratory trends among university-educated Australian residents. This includes individuals whose level of highest educational attainment was one of the following: Postgraduate Degree Level; Graduate Diploma and Graduate Certificate Level; or Bachelor Degree Level. As before, we limit our attention to migratory patterns over the period 2011–16, as we did not find any significant differences over earlier time periods. Figure 12 plots migration rates across UCLs for university-educated individuals.

While the migration away from mid-sized regional urban areas to large metropolitan urban areas is not as dramatic as for individuals in the age group 18–29 years, the trends and patterns are similar. Interestingly, among large urban areas, Sydney has seen a small out-migration (-0.3%) and Adelaide has seen a significant out-migration (-3.2%).

Table 5 lists the top twenty UCLs in our sample by net migration rate among college educated individuals over the period 2011–16. Medium-sized urban areas that have seen in-migration of college educated individuals include popular retirement destinations (such as Inverloch and Victor Harbor), commuter towns (such as Yanchep), tourist destinations (such as Margaret River) and regional centres (such as Port Macquarie and Orange).

Figure 12: Migration rate for university-educated individuals across different UCLs over the period 2011–16



Source: Author research based on data collected by the Australian Census.

Table 5: Top twenty UCLs in terms of migration rates of university-educated individuals over the period 2011–16

UCL	State	Total population in 2016	University-educated individuals in 2016	Net flow over the period 2011–16	Migration rate over the period 2011–16
Inverloch	VIC	5,066	388	135	34.9%
Yanchep	WA	8,862	447	96	21.5%
Ocean Grove–Barwon Heads	VIC	18,208	3,129	619	19.8%
Dunsborough	WA	6,034	551	107	19.3%
Margaret River	WA	6,394	548	64	11.6%
Castlemaine	VIC	9,933	1,438	166	11.5%
Victor Harbor	SA	15,267	1,201	132	11.0%
Torquay–Jan Juc	VIC	16,942	2,930	312	10.7%
Sunshine Coast	QLD	243,377	28,491	2,991	10.5%
Bowral–Mittagong	NSW	21,397	3,278	272	8.3%
Highfields	QLD	9,474	935	62	6.6%
Drouin	VIC	11,889	626	40	6.3%
Port Macquarie	NSW	44,811	4,407	265	6.0%
Blue Mountains	NSW	29,320	5,546	326	5.9%
Central Coast	NSW	307,740	30,827	1,745	5.7%
Leopold	VIC	11,882	972	49	5.1%
Bargara–Innes Park	QLD	11,059	859	43	5.0%
Gisborne	VIC	9,822	1,103	50	4.5%
Busselton	WA	25,325	1,713	71	4.1%
Orange	NSW	37,181	3,534	138	3.9%

Source: Author research based on data collected by the Australian Census.

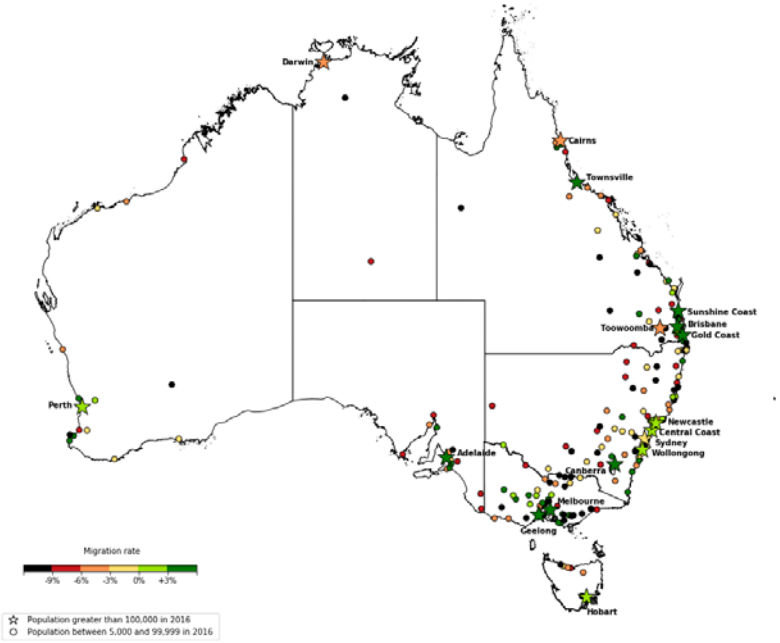
2.8 Domestic migration among Indigenous Australians

In this section, we examine internal migratory trends among Indigenous Australians; individuals who identified themselves as being of Indigenous Australian and/or Torres Strait Islander origin. As with the other sub-populations, we limit our attention to migratory patterns over the period 2011–16, as we did not find any significant differences over earlier time periods. Figure 13 plots migration rates across UCLs for Indigenous Australians.

In general, large urban areas have seen net in-migration (median migration rate of 2.9% over 2011–16), while medium-sized urban areas have seen net out-migration (median migration rate of -4.4% over 2011–16).

Table 6 lists the top twenty UCLs in our sample by migration rate among Indigenous Australians over the period 2011–16; and Table 7 lists the bottom twenty. Note that due to very small sample sizes, small net flows can lead to large migration rates. For the sake of comparison, we also include migration rates for the general population across these same UCLs, to see if there are any interesting points of difference. Horsham and Port Pirie have seen negative migration rates for the general population but positive rates for Indigenous Australians. Conversely, Bowral–Mittagong has seen positive migration rates for the general population but negative rates for Indigenous Australians. We will examine the determinants of these differences in greater detail in the next stage of our analysis.

Figure 13: Migration rate for Indigenous Australians across different UCLs over the period 2011–16



Source: Author research based on data collected by the Australian Census.

Table 6: Top twenty UCLs in terms of migration rates of indigenous Australians over the period 2011–16

		General population		Indigenous Australians		
UCL	State	Population in 2016	Migration rate over 2011–16	Population in 2016	Net flow over 2011–16	Migration rate over 2011–16
Leopold	VIC	11,882	13.3%	92	33	35.9%
Strathalbyn	SA	5,488	1.3%	68	24	35.5%
Torquay–Jan Juc	VIC	16,942	11.1%	76	16	20.6%
Murwillumbah	NSW	9,245	0.8%	218	44	20.2%
Kilmore	VIC	6,953	9.0%	28	5	19.8%
Yanchep	WA	8,862	33.4%	104	15	14.6%
Drouin	VIC	11,889	16.2%	115	17	14.6%
Sandstone Point–Ningi	QLD	9,094	11.2%	158	18	11.3%
Merimbula	NSW	7,520	4.4%	66	7	10.2%
Wonthaggi	VIC	7,917	3.0%	30	3	9.4%
Horsham	VIC	15,630	-4.7%	158	14	8.8%
Moe–Newborough	VIC	15,062	-2.7%	154	13	8.6%
Goolwa	SA	7,715	4.8%	84	7	8.6%
Port Pirie	SA	13,743	-3.6%	401	34	8.5%
Yamba	NSW	6,043	3.7%	105	9	8.4%
Margaret River	WA	6,394	8.4%	53	4	8.1%
Gracemere	QLD	10,813	9.7%	574	45	7.8%
Gordonvale	QLD	5,977	2.9%	423	33	7.7%
Inverloch	VIC	5,066	6.8%	19	1	7.2%
Melton	VIC	54,455	8.9%	571	40	7.0%

Source: Author research based on data collected by the Australian Census.

Table 7: Bottom twenty UCLs in terms of migration rates of indigenous Australians over the period 2011–16

		General population		Indigenous Australians		
UCL	State	Population in 2016	Migration rate over 2011–16	Population in 2016	Net flow over 2011–16	Migration rate over 2011–16
Alstonville	NSW	5,064	-4.2%	24	-25	-103.9%
Yarrawonga–Mulwala	VIC	9,805	1.6%	43	-22	-51.7%
Anna Bay–Boat Harbour	NSW	5,056	0.1%	97	-41	-42.7%
Beerwah	QLD	5,033	7.3%	56	-23	-40.3%
Tannum Sands–Boyne Island	QLD	9,522	-8.4%	174	-63	-36.2%
Pottsville	NSW	6,550	4.3%	124	-42	-34.1%
Portarlington–St Leonards	VIC	6,883	10.3%	36	-12	-33.3%
Wallan	VIC	8,521	13.0%	31	-9	-29.0%
Mount Cotton	QLD	5,703	13.4%	54	-15	-27.5%
Emerald	QLD	13,529	-14.7%	288	-70	-24.3%
Corowa–Wahgunyah	NSW	6,357	-3.1%	46	-11	-23.1%
Colac	VIC	11,890	-5.9%	84	-17	-20.7%
Benalla	VIC	9,296	-4.7%	99	-20	-20.4%
Bowral–Mittagong	NSW	21,397	6.2%	233	-48	-20.4%
Mount Isa	QLD	18,342	-22.7%	2,152	-434	-20.2%
Biloela	QLD	5,724	-15.0%	149	-29	-19.3%
Byron Bay	NSW	9,246	-2.1%	91	-17	-18.8%
Sale	VIC	13,507	-5.7%	114	-21	-18.4%
Nuriootpa	SA	5,685	0.1%	41	-7	-18.0%
Cootamundra	NSW	5,671	-4.9%	186	-33	-17.5%

Source: Author research based on data collected by the Australian Census.

2.9 Summary of key findings

Based on the analysis and the visualisations reported in previous sections, our key findings can be summarised as follows:

1. Mid-sized urban areas attracted 5,748 and 5,147 more domestic migrants than they lost in 2001–06 and 2006–11. However, they lost 23,091 more domestic migrants than they attracted in 2011–16. The average mid-sized urban area had a net migration rate of -1.4 per cent over the period 2011–16, while the average large urban area had a corresponding net migration rate of 0.6 per cent.
2. Our findings differ from recent related work (such as Bourne et al. 2020; Hugo et al. 2015) that found more people have moved to regional Australia than have left regional Australia. However, these differences arise from different methodologies. Both Bourne et al. (2020) and Hugo et al. (2015) include all urban areas other than the eight capital cities within their definition of regional Australia. Our analysis distinguishes between large and mid-sized urban areas based on population size. While large urban areas outside of the eight capital cities, such as Gold Coast and Wollongong, have had positive net migration rates, smaller urban areas have had negative net migration rates.

3. Among capital cities, Melbourne, Brisbane, Perth and Canberra have consistently attracted more domestic migrants than they have lost. Conversely, Sydney, Adelaide, Darwin and Hobart have consistently lost more domestic migrants than they have attracted. All capital cities and other large urban areas have attracted disproportionately more international migrants than the national average. The arrival of international migrants in smaller cities and other parts of non-metropolitan Australia has been a small-scale phenomena for the past five decades. For more than half a century we have known approximately 85 per cent of all new migrants settle in Australia's two largest cities (Hugo and Smailes 1985), with very few moving to smaller urban centres. Our analysis confirms these findings.
4. Mid-sized urban areas surrounding capital cities have attracted more domestic migrants than they have lost, and most of these migrants have come from the surrounding capital city. These mid-sized urban areas have in some cases also attracted disproportionately more international migrants than the national average.
5. Coastal mid-sized urban areas appear more likely to have attracted domestic migrants than inland mid-sized urban areas. Our analysis corroborates findings from previous studies. As Hugo et al. (2015: 102) writes, "One of the most robust and substantial trends in population change in Australia over the last three decades has been the population growth rates well above the national average in coastal communities along the east, south-east and south-western coasts of Australia. Much of this growth has been sustained by so-called 'sea change' migration (Burnley and Murphy, 2004; Salt, 2001, 2004). Internal migration is the main reason why non-metropolitan coastal communities are growing faster than their inland counterparts…An ABS (2004) analysis of internal migration trends to sea change areas focussed on the high-growth communities. It found that only one-third of new residents to those communities came from capital cities, while the rest were from other non-metropolitan areas. Hence, the growth of coastal areas has, to some extent, been at the expense of inland areas."
6. Smaller regional centres with tourism and mining-based local economies have attracted disproportionately more international migrants. While the role of tourism and mining on regional development has attracted considerable recent discussion, findings in the literature are ambiguous. For example, with regards to tourism, Hugo et al. (2015: 77) agree that 'immigrants have long been an important element in the regional tourist workforce with language factors being of some importance, especially for areas attracting large numbers of Asian tourists' (see also Bell and Carr 1994). However, with regards to mining, Hugo et al. (2015: 119) find that "a significant proportion of mining employment is in capital cities … a reflection of the increased significance of FIFO and drive-in/drive-out workers who work on site in regional areas but have their usual place of residence in other localities, often capital cities. Nevertheless, the mining employment in regional areas has more than doubled over the last decade and grew by over 10 per cent per annum during the 2006–11 intercensal period."
7. Mid-sized urban areas that are not on the coastline, nor in close proximity to a large urban area, have steadily lost domestic migrants. Our analysis is in close agreement with other studies. For example, Hugo et al. (2015: 103) find that 'in 2001–06 coastal statistical divisions grew at three times the rate of inland statistical divisions, while in the 2006–11 period it was almost 20 per cent faster.'
8. Patterns of domestic migration appear to be strongly influenced by state boundaries. We do not find any discussion of the same in the literature. We argue that these patterns are reflective of Australia's federal political system, where state-level policies likely exert some influence on intra-state patterns of migration.
9. Mid-sized urban areas have seen very high out-migration of young adults, i.e. individuals in the age group 18–29 years, and university-educated individuals. On average, these urban areas have had net out-migration rates of 30 per cent and 12 per cent for young adults and university-educated individuals, respectively, over the period 2011–16. This trend has been similar over preceding five-year periods. High patterns of youth out-migration from regional Australia are well recognised in the literature (such as Bourne et al. 2020), and our analysis corroborates these findings.

10. Older adults (those aged 65 years or older) have been more likely to migrate to large urban areas, and coastal mid-sized urban areas that have emerged as popular retirement destinations. Again, this is consistent with other studies. For example, Hugo et al. (2015: 91) note that "while the majority of older Australians live in capital cities there is a significant representation in regional areas…the older regional population is concentrated in the coastal, south-eastern and south-western parts of the nation…There is a greater concentration of the young aged in regional areas reflecting the fact that there is a strong pattern of migration of people in their 80s and 70s from regional to capital cities…Many of these move to seek to be closer to medical services or to family to care for them in old age. Many are also former retirement migrants who moved out of cities on retirement to a resort location."
11. There are no significant discernible visual differences in migration patterns between women and men. Based on our review of previous studies, we did not find any gender differences in migration and settlement patterns reported in the literature.
12. Large urban areas have seen net in-migration of Indigenous Australians (median migration rate of 2.9% over 2011–16), while medium-sized urban areas have seen net out-migration (median migration rate of -4.4% over 2011–16). Multiple previous studies have examined migration and mobility patterns of Indigenous Australians (such as Taylor and Bell 2018; Biddle and Hunter 2006; Kinfu 2006). Consistent with these studies, our analysis finds that migration rates tend to be higher for Indigenous Australians, indicating greater population mobility. However, we find that migration patterns appear to be consistent with those of the general population. In contrast, Biddle and Hunter (2006: 321) find that 'Indigenous Australians are less responsive to local economic factors than other Australians, with social and cultural factors appearing to play a particularly significant role in their decision making.'

3. Macroeconomic analysis of migration patterns

- **Mid-sized urban areas with high average incomes, low unemployment rates, and easy access to education, arts and recreation services, are more likely to attract and retain migrants, especially those who are young, university-educated and/or international migrants.**

- **Locational factors, such as access to coastline and distance to nearest metropolitan centre, also have an important impact. For example, coastal cities that are in close proximity to a major metropolitan centre are more likely to attract both domestic and international migrants.**

In this chapter, we examine how migration rates across different sub-populations have varied across urban areas over time, as a function of their local economy, infrastructure and access to other amenities.

The remainder of this chapter is structured as follows: Section 3.1 reviews the existing literature on the growth and decline of urban centres to identify the key determinants of migration rates across urban areas. Section 3.2 describes the data and econometric framework in more detail. Section 3.3 concludes with a presentation of findings from our analysis.

3.1 Literature review

The literature on human migration has sought to understand the attractiveness of different urban areas in terms of multiple competing and complementary factors. "Traditional theories regarding the attractiveness of 'places' toward migrants highlight potential financial and economic returns as the basic magnet for migrants, making differences in wages, employment opportunities, and other forms of expected income (e.g. state transfers) the driving force behind regional migration" (Rodríguez-Pose and Ketterer 2012: 536). Consequently, a number of studies have examined the dependence between migration rates across different urban areas on one hand, and the structure and performance of their local economies on the other, as measured by variables such as average incomes, unemployment rates and industrial mix (see, for example, Simionescu et al. 2016; Mayda 2010; Hunt 2006; Simon 2004; Jennissen 2003). While studies may disagree about the relative salience of these different economic variables, it is widely accepted that these variables are key determinants of migration flows.

The literature has also emphasised the importance of climate and natural environment on human migration due to their impacts on quality-of-life (such as Chen and Rosenthal 2008; Rappaport 2007). As Partridge (2010: 514) writes, 'researchers … give a special emphasis to the role of amenity migration in which people move to areas with high levels of natural amenities such as warm winters, proximity to oceans and lakes, and pleasant landscape (Ullman 1954; Graves 1976, 1979, 1980; Deller et al. 2001; Glaeser et al. 2001; Partridge and Rickman 2003; Rappaport 2007).' In fact, in their comparison of the relative effects of economic and natural environmental factors on migration rates in the United States, Partridge (2010) concluded that the effects of the latter far outweigh those of the former.

Research has found that access to place-based urban amenities can further help attract and retain migrants to urban areas. These may include access to, among other services, education (such as Gabriel 2006; Alston 2004); healthcare (Miles 2015; Gehring 2006); recreational services (such as Deller et al. 2001); and transport infrastructure (such as Duranton and Turner 2012).

Finally, sociological studies have also emphasised the role of social networks in driving migration and settlement patterns (Ryan, 2011; Haug, 2008; Massey, 1993). As MacDonald and MacDonald (1964: 82) write, 'migration is patently more complex than that merely mechanical reshuffling of heads which is assumed by crude economic 'push-pull' models'. In particular, the concept of chain migration—'movement in which prospective migrants learn of opportunities, are provided with transportation, and have initial accommodation and employment arranged by means of primary social relationships with previous migrants' (MacDonald and MacDonald (1964: 82))—has been used to explain the emergence of ethnic enclaves in urban areas.

The reader should note that the literature on the determinants of regional and international migration and settlement patterns is large and expansive. While a comprehensive review of this body of work is considered beyond the scope of the present study, we have discussed the major determinants identified by this body of work. For more details on the subject within an Australian context, the reader is referred to, among others, Raymer and Baffour (2018) and Bell et al. (2017). In the discussion that follows, we relate our own findings to this broader body of work, whenever possible.

3.2 Data and econometric framework

Data for our analysis has been sourced from the 2006, 2011 and 2016 Census in Australia. As mentioned previously, we examine migration flows over the period 2001–16 between 204 UCLs with populations greater than 5,000, as per the 2016 Census. For each pair of UCLs, we examine cross-migration patterns across different sub-population groups. Data for our analysis is drawn from cross-classified tables of UCL of residence at Census night and five years prior for the 2006, 2011 and 2016 Census. Therefore, our analysis examines migration patterns over the following three five-year periods: 2001–06, 2006–11 and 2011–16.

The dependent variables of interest are migration rates for different sub-population groups, such that r_{nti} denotes the migration rate for sub-population n and UCL i over the five-year period t, and is defined per equation (1) in Section 2. Separate regressions are employed to examine migration rates for each sub-population group, using the following general econometric specification:

$$r_{nti} = \mu_{nt} + \boldsymbol{\beta_n x_{it}} + \rho_n \sum_k w_{ik} r_{ntk} + \varepsilon_{nti} \qquad (3)$$

The parameter μ_{nt} denotes fixed effects specific to time period t, and captures short-term deviations specific to particular time periods. For example, as noted in Section 2, international migration rates peaked during 2006–11, due likely to the 2000s commodities boom that greatly benefited the Australian economy. The parameter μ_{nt} would capture such effects specific to a particular time period and sub-population group, but applicable to all urban areas in the sample for that year.

The vector of variables x_{it} denote different measures of the primary determinants of migration and settlement patterns identified by our review of the existing literature in the previous sub-section. We use the population size of an urban area to capture push and pull factors associated with agglomeration economies and diseconomies. For example, studies have found that larger urban areas frequently offer better access to jobs and services, but are also more likely to have expensive housing markets and higher congestion (Fujita 1989; Henderson 1974; Mills 1967).

We capture locational effects through three separate variables. First, we include a binary variable to identify coastal cities, because the literature has consistently found that coastal urban areas are more desirable residential locations and benefit from increased economic activity (Rodríguez-Pose and Ketterer 2012; Beer and Clower 2006). Second, we include distance to the nearest capital city to capture spatial spillover effects between surrounding urban areas located in close proximity to a large metropolitan centre (Bosker 2007). And third, given the spatial nature of our data, and the spillover effects that may exist between any two urban areas in close proximity to each other, we employ a spatial lag in our model specification. The migration rate for a particular sub-population in a particular UCL during a given time period depends on the corresponding rates in surrounding urban areas during that same time period. The parameter ρ_n captures the direction and magnitude of effect exerted by neighbouring areas, and the variable w_{ik} denotes the degree of connectivity between the urban areas i and k. There are many different ways in which w_{ik} might be constructed (for a comprehensive review of these different methods, see, for example, Anselin 2013). In our case, we constructed distance-based weights based on the well-known gravity model, where the degree of connectivity between two urban areas is inversely proportional to the square of the physical distance separating these areas. We assumed further that urban areas that are more than 1000 kilometres apart do not exert any influence on each other (i.e. $w_{ik} = 0$ for these areas i and k). The weights are normalised such that $\sum_k w_{ik} = 1$ for any urban area i.

Consistent with the literature, we measure the economic determinants of migration rates in terms of average incomes for full-time workers and unemployment rates. In addition, we also include average monthly mortgage payments as a measure of the local cost-of-living. Finally, we include the proportion of the local labour force employed in the following four one-digit Australia and New Zealand Standard Industrial Classification (ANZSIC) sectors to characterise the mix of primary, secondary and tertiary activity within the local economy:

1. agriculture, forestry and fishing
2. mining
3. manufacturing
4. professional, scientific and technical services.

In order to measure the quality of local urban services, we use the number of individuals employed in the following sub-sectors of the local economy per 1,000 residents to measure quality of local public transport and regional connectivity:

1. preschool and school education, two-digit ANZSIC sector used to measure quality of local school education
2. tertiary education, two-digit ANZSIC sector used to measure quality of local college education
3. hospitals, two-digit ANZSIC sector used to measure quality of local healthcare
4. arts and recreation services, one-digit ANZSIC sector used to measure quality of local cultural offerings
5. food and beverage services, two-digit ANZSIC sector used to measure quality of local cafes, restaurants, pubs, bars, etc
6. urban bus transport (Including tramway), four-digit ANZSIC sector used.

3.3 Estimation results

All models were estimated through the PySal library (Rey and Anselin, 2010) in Python using an implementation of maximum likelihood estimation for regression equations with spatial lag. The estimation results for our final specifications are reported in Tables 8–10. Each table reports estimation results for migration rates for different sub-population groups. We summarise the results as follows:

1. Population effects
    a. Population size has a negative impact on domestic migration rates across the general population. However, it has a positive impact on migration rates among 18–29 year old individuals, 65+ year old individuals, individuals of Aboriginal and Torres Strait Islander origin, and university-educated individuals. Note that this variable serves as a proxy for economy, amenity and quality-of-life factors not included explicitly in our analysis that are likely correlated with population size, such as access to employment, education and other services. Our analysis indicates that there has been a consistent pattern of out-migration of middle-aged individuals from large urban areas, and towards mid-sized urban areas. This could potentially be because these individuals are in search of better quality-of-life, as reported by other studies (such as Forbes et al. 2020; Verdich 2010).
    b. Population size has a positive impact on overseas migration rates, i.e. larger urban areas are more likely to attract overseas migrants than smaller urban areas. This is consistent with findings from previous studies. For example, as mentioned in the previous chapter, approximately 85 per cent of new international migrants have settled in Australia's two largest cities (Hugo and Smailes 1985), with very few moving to smaller urban centres. Our findings confirm that this pattern still holds, with roughly 57 per cent of new international migrants over the period 2011–16 settling in Sydney and Melbourne.
2. Location effects
    a. Coastal cities are more likely to attract domestic migrants, particularly 30–64 year old and/or university-educated individuals, as well as overseas migrants. The importance of natural amenities (such as warm weather, proximity to oceans and lakes, and attractive landscapes) to human migration and settlement patterns is well-recognised (such as Partridge et al. 2010; Rappaport 2007; Glaeser et al. 2001), and our analysis corroborates these findings.
    b. Distance to nearest capital city has a negative impact on domestic migration. Urban areas in close proximity to a major metropolitan centre are more likely to receive migrants. Note that large metropolitan centres themselves are likely to receive fewer domestic migrants, as indicated by the negative relationship with population size. Therefore, the positive impact of proximity indicates an outward migration from the metropolitan centre to surrounding urban areas. These findings are consistent with gravity models of migration - common early paradigms for studying migration patterns that posit that migration rates between any two regions are inversely proportional to the distance between these regions (such as Poot et al. 2016).
    c. Spatial lag is found to have a positive impact on overseas migration rates. This suggests that chain migration effects may be at play, such that high migration rates for an urban area can create positive spillover effects for other surrounding urban areas. The effect of chain migration on settlement patterns of international migrants in Australia has been recognised by other studies (such as Hougaz 2015; Žabčić 2014), and has been used to explain the growth of ethnic enclaves in major Australian cities.
3. Economic effects
    a. Unemployment rates have a negative effect on domestic migration rates across the general population. Local incomes have a positive effect on attracting 18–29 year old domestic migrants and overseas migrants. Similar results have been reported by previous studies with regards to the impact of incomes and unemployment rates (such as Biddle and Hunter, 2006). These economic effects have usually been explained using the human capital model, which predicts that a household migrates when the discounted future income stream available at a destination is greater than the discounted future income stream at the person's current location and the costs of migration (Biddle and Hunter 2006).

b. Local economies with large agricultural and mining sectors are more likely to have lost domestic migrants, but gained overseas migrants. Local economies with a large manufacturing sector are more likely to have gained 18–29 year old domestic migrants and overseas migrants. Sector-specific effects on migration and settlement patterns are reflective of 'significant structural change [in the Australian economy] over recent decades with declining employment in agriculture and manufacturing and increases in mining and services' (Hugo et al. 2015: 76). It has been argued that "long-standing patterns of out-migration from rural areas [in Australia] have seen new forms of engagement with the global in the form of international labour migration … structural gaps in local and regional labour markets are being plugged by permanent and temporary migrants, frequently from non-English-speaking background countries" (Argent and Tonts 2014: 141).

4. Access to services

   a. Access to pre-school and school education has a positive impact on domestic migration rates for university-educated individuals. Access to tertiary education has a positive effect on attracting 18–29 year old domestic migrants. The out-migration of young adults from regional Australia to large cities for access to tertiary education (and employment) opportunities is a well recognised phenomenon. Bourne et al. (2020: 9) write that "there are also increasing efforts to provide regional youth with education and career options within regional areas that are comparable to those offered in cities, with the intention of minimising this outflow in the first instance." Similarly, access to tertiary education also has a positive effect on attracting overseas migrants. Overseas students are a large fraction of tertiary student enrolments in Australia. In 2019, there were 440,000 overseas students enrolled in higher education institutions in Australia, comprising 27 per cent of total enrollments.

   b. Access to hospitals does not seem to have any statistically significant effect on migration rates. This is somewhat surprising, but not inconsistent with the literature. On one hand, studies have argued that 'health services are of increasing significance with ageing of the regional populations being exacerbated by significant levels of retirement migration, especially to coastal areas' (Hugo et al. 2015: 77). On the other, studies that have examined household preferences for migration, such as Stimson and McCrea (2004), have not identified access to health services as an important factor.

   c. Access to arts and recreation services and food and beverage services do not have any impact on domestic migration, but have a positive effect on overseas migration. It is likely that more multicultural cities have more developed services in these sectors, and the variable is indirectly capturing the effect of multiculturalism on overseas migration.

   d. Access to local public transport has a strong positive impact on domestic migration rates across all sub-population groups, but no effect on overseas migration. This is likely due to better regional connectivity. The finding is consistent with theoretical models of migration, such as the gravity model (Poot et al. 2016) and the human capital model (Biddle and Hunte, 2006).

Table 8: Estimation results of linear regression of domestic migration rates for the general population, males and females across UCLs over the period 2001–16

	General population		Males		Females	
Explanatory variable	est	p-val	est	p-val	est	p-val
Constant	9.693	0.17	-7.958	0.28	-4.841	0.51
Time effects						
2006–11	0.691	0.40	0.415	0.63	0.375	0.66
2011–16	-0.238	0.78	-0.383	0.67	-0.502	0.58
Population effects						
Population (10,000s)	-0.012	0.27	**-0.025**	**0.03**	**-0.025**	**0.03**
Logarithm of population	**-0.845**	**0.10**	0.634	0.24	0.457	0.39
Population less than 100,000	-0.489	0.81	0.661	0.76	0.320	0.88
Location effects						
Coastal city	**3.945**	**0.00**	**3.787**	**0.00**	**3.387**	**0.00**
Distance to nearest capital (km)	**-0.006**	**0.00**	**-0.006**	**0.00**	**-0.007**	**0.00**
Spatial lag	0.026	0.66	0.030	0.60	0.007	0.90
Income, employment and cost of living						
Unemployment rate (%)	-0.275	0.12	-0.303	0.10	-0.280	0.13
Average weekly personal income ($)	0.000	-	0.000	-	0.000	-
Average monthly mortgage payments ($)	0.000	-	0.000	-	0.000	-
Nature of local economic activity						
Proportion of workforce employed in…						
Agriculture, Forestry and Fishing (%)	**-0.724**	**0.00**	**-0.659**	**0.00**	**-0.692**	**0.00**
Mining (%)	**-0.141**	**0.04**	-0.092	0.21	**-0.161**	**0.03**
Manufacturing (%)	-0.045	0.59	0.026	0.77	0.006	0.95
Professional, Scientific and Technical Services (%)	0.270	0.39	0.207	0.53	0.207	0.53
Access to services						
Number of workers in following sub-sectors, per 1,000 residents						
Preschool and School Education	0.000	-	0.000	-	0.000	-
Tertiary Education	0.000	-	0.000	-	0.000	-
Hospitals	0.000	-	0.000	-	0.000	-
Arts and Recreation Services	0.000	-	0.000	-	0.000	-
Food and Beverage Services	0.000	-	0.000	-	0.000	-
Urban Bus Transport (Including Tramway)	**2.178**	**0.00**	**2.281**	**0.00**	**2.221**	**0.00**
Summary statistics						
Sample size		612		612		612
R-squared		0.239		0.220		0.242
Adjusted R-squared		0.239		0.220		0.242

Bolded values indicate the corresponding parameter is statistically significantly different from zero with a confidence level of 90%.

Source: Author research based on analysis of data collected by the Australian Census.

Table 9: Estimation results of linear regression of domestic migration rates for different age groups across UCLs over the period 2001–16

	18-29 years		30-64 years		65+ years	
Explanatory variable	est	p-val	est	p-val	est	p-val
Constant	**-209.83**	**0.00**	7.535	0.32	**-31.514**	**0.02**
Time effects						
2006-11	0.206	0.95	-0.327	0.71	**9.256**	**0.00**
2011-16	-5.671	0.34	**-1.639**	**0.08**	**7.554**	**0.00**
Population effects						
Population (10,000s)	**-0.086**	**0.01**	**-0.023**	**0.06**	-0.023	0.29
Logarithm of population	**16.866**	**0.00**	-0.663	0.23	**3.789**	**0.00**
Population less than 100,000	**10.899**	**0.07**	-0.356	0.87	4.423	0.28
Location effects						
Coastal city	**-3.999**	**0.08**	**4.099**	**0.00**	-0.271	0.86
Distance to nearest capital (km)	0.003	0.35	**-0.008**	**0.00**	**-0.003**	**0.10**
Spatial lag	**0.109**	**0.04**	0.012	0.84	**-0.125**	**0.04**
Income, employment and cost of living						
Unemployment rate (%)	**-1.802**	**0.00**	-0.176	0.36	0.000	-
Average weekly personal income ($)	**0.029**	**0.03**	0.000	-	0.000	-
Average monthly mortgage payments ($)	0.000	-	0.000	-	**-0.011**	**0.00**
Nature of local economic activity						
Proportion of workforce employed in…						
Agriculture, Forestry and Fishing (%)	-0.196	0.60	**-0.685**	**0.00**	0.181	0.46
Mining (%)	0.328	0.31	**-0.237**	**0.00**	**-0.373**	**0.01**
Manufacturing (%)	**0.708**	**0.00**	-0.025	0.78	-0.106	0.51
Professional, Scientific and Technical Services (%)	**-5.048**	**0.00**	0.582	0.09	-0.276	0.68
Access to services						
Number of workers in following sub-sectors, per 1,000 residents						
Preschool and School Education	0.000	-	0.000	-	0.000	-
Tertiary Education	**0.421**	**0.08**	0.000	-	0.000	-
Hospitals	0.003	0.99	0.000	-	0.000	-
Arts and Recreation Services	0.000	-	0.000	-	0.000	-
Food and Beverage Services	0.000	-	0.000	-	0.000	-
Urban Bus Transport (Including Tramway)	**4.354**	**0.01**	**1.933**	**0.00**	**3.023**	**0.00**
Summary statistics						
Sample size		612		612		612
R-squared		0.392		0.273		0.129
Adjusted R-squared		0.391		0.273		0.117

Bolded values indicate the corresponding parameter is statistically significantly different from zero with a confidence level of 90%.

Source: Author research based on analysis of data collected by the Australian Census.

Table 10: Estimation results of linear regression of domestic migration rates for Indigenous and university-educated individuals, and overseas migration rates for the general population, across UCLs over the period 2001–16

	Indigenous		University-educated		Intl. migrants	
Explanatory variable	est	p-val	est	p-val	est	p-val
Constant	**-115.35**	**0.04**	**-93.666**	**0.00**	**-6.197**	**0.00**
Time effects						
2006–11	12.545	0.16	**5.688**	**0.05**	0.129	0.46
2011–16	2.826	0.84	4.236	0.17	-0.359	0.23
Population effects						
Population (10,000s)	-0.016	0.85	**-0.083**	**0.01**	**0.007**	**0.00**
Logarithm of population	**9.783**	**0.01**	**5.626**	**0.00**	**0.277**	**0.00**
Population less than 100,000	5.708	0.71	**13.747**	**0.01**	-0.322	0.26
Location effects						
Coastal city	2.452	0.68	**8.544**	**0.00**	**0.356**	**0.00**
Distance to nearest capital (km)	-0.011	0.15	-0.004	0.14	**0.001**	**0.00**
Spatial lag	-0.024	0.70	-0.043	0.46	**0.417**	**0.00**
Income, employment and cost of living						
Unemployment rate (%)	0.000	-	**-0.946**	**0.07**	-0.001	0.96
Average weekly personal income ($)	0.023	0.47	0.000	-	**0.001**	**0.03**
Average monthly mortgage payments ($)	0.000	-	-0.006	0.20	0.000	-
Nature of local economic activity						
Proportion of workforce employed in…						
Agriculture, Forestry and Fishing (%)	1.090	0.26	**-0.999**	**0.00**	**0.211**	**0.00**
Mining (%)	-0.261	0.76	-0.064	0.75	**0.072**	**0.00**
Manufacturing (%)	-0.554	0.37	0.165	0.46	**0.032**	**0.01**
Professional, Scientific and Technical Services (%)	**-8.072**	**0.00**	**3.335**	**0.00**	**0.179**	**0.00**
Access to services						
Number of workers in following sub-sectors, per 1,000 residents						
Preschool and School Education	0.000	-	**0.371**	**0.03**	0.000	-
Tertiary Education	0.000	-	0.000	-	**0.040**	**0.00**
Hospitals	0.326	0.46	0.001	1.00	0.000	-
Arts and Recreation Services	0.000	-	0.000	-	**0.166**	**0.00**
Food and Beverage Services	0.000	-	0.000	-	**0.016**	**0.08**
Urban Bus Transport (Including Tramway)	**8.952**	**0.03**	**2.467**	**0.09**	0.000	-
Summary statistics						
Sample size		612		612		612
R-squared		0.055		0.194		0.623
Adjusted R-squared		0.055		0.193		0.557

Bolded values indicate the corresponding parameter is statistically significantly different from zero with a confidence level of 90%.

Source: Author research based on analysis of data collected by the Australian Census.

3.4 Policy implications

Findings from our analysis suggest that Australian migration patterns are driven by a combination of economic, location and amenity-based factors. Consequently, policies seeking to encourage greater settlement in regional centres should focus on improving both local economies and offering greater quality-of-life.

- We find some evidence that the strength of local economies, as reflected by average incomes and unemployment rates, impact migration rates, especially among those who are young, university-educated and/or international migrants.
- Locational factors, such as access to coastline and distance to the nearest metropolitan centre, have an important impact, such that coastal cities that are in close proximity to a major metropolitan centre, are most likely to attract migrants.
- The quality of local amenities, such as education, arts and recreation services, was captured by the number of workers employed in these sub-sectors per 1,000 local residents. We found the impacts of these services to be statistically insignificant for the general population, but statistically significant for those who are young, university-educated and/or international migrants, indicating that these population sub-groups value access to these amenities.

4. Individual preferences for settlement in urban and regional centres

- **Three-quarters of those surveyed by our study appear open to moving to a mid-sized city under the right circumstances.**
- **One in five survey respondents would be encouraged to move to mid-sized cities if they could offer comparable employment and education opportunities to large-sized cities.**
- **One in two survey respondents view mid-sized cities as excellent places to retire, and would be encouraged to move there if they could get support for post retirement living in terms of healthcare and home ownership.**

In this chapter, we develop microeconomic models of how individuals decide where to settle, as a function of their demographic characteristics (e.g. income, race and ethnicity, household structure) and place attributes (e.g. education and employment opportunities, housing costs, climate and natural environment, cultural amenities). Data for our analysis was collected through an online survey of roughly 3,000 demographically and geographically representative Australian households, administered in February 2021 as part of this study.

The remainder of this chapter is structured as follows: Section 4.1 reviews different relevant methodologies for developing microeconomic models of regional migration, and motivates the particular methodology employed by the present study. Section 4.2 describes the survey instrument used for data collection. Section 4.3 describes the sample in terms of baseline demographic and geographic variables. Section 4.4 undertakes a descriptive analysis of the dataset. Section 4.5 introduces the econometric framework used to model the data. Section 4.6 presents estimation results from the econometric framework. Section 4.7 concludes with a discussion of the key policy implications.

4.1 Literature review

Traditionally, individual preferences for settlement in urban and regional centres have been analysed using observed patterns of migration and settlement in the real world. Similar to our analysis in the preceding chapter, some studies have examined how migration rates vary across different urban centres, as a function of the local economy, quality-of-life, physical and natural environment, etc., stratified by demographic characteristics (such as Chen and Rosenthal 2008; Rodríguez-Pose and Ketterer 2012; Buch et al. 2014). Some studies have employed hedonic regressions (Rosen 1974; 1986) where, for example, average housing costs or wage rates across different individuals residing in different urban centres may be regressed against a number of individual-specific and place-specific factors to estimate compensating differentials for each factor of interest (such as Berger et al. 2008; Zheng et al. 2009). Some studies have used discrete choice models to examine when and why particular individuals choose to migrate, as a function of both their personal circumstances and the broader environment in which they live (such as Clark et al. 2003; Xing and Zhang 2017). Regardless of the econometric framework, in each of these cases data has been based on observable decisions made by individuals in the real world.

However, these observational datasets usually suffer from missing variables and/or measurement errors, due to either lack of key information, or imprecision in measuring this information. For example, the Census records mortgage and rent data for participating individuals, in addition to relevant individual-specific factors that are likely to influence this decision. However, information relating to place-specific determinants of settlement choice, such as access to public infrastructure, local amenities and the natural environment, must necessarily be obtained from other secondary sources. In the absence of such information, estimates of household preferences using observational data are subject to multiple sources of bias (Earnhart 2001).

Additionally, observational data offers limited statistical control over the explanatory variables of interest. The problem is particularly acute in the case of uncommon variables or variables with little variability, where there aren't enough observations to isolate the effect of different variables of interest (Earnhart 2001). The issue can further be compounded by multicollinearity, where two or more explanatory variables are highly linearly correlated, and there isn't enough variation in the data to reliably estimate the marginal effect of each variable of interest (Greene 2003).

Finally, observational data can only measure preferences under past or current market conditions. In cases where market conditions are relatively stable, it is reasonable to assume the past and/or current preferences are good predictors of future preferences. However, in cases where there has been a structural break, the use of historical data to predict future patterns is questionable. For example, as shown by our analysis in the previous sections, historic data indicates that mid-sized urban areas in Australia have been consistently shrinking in population since 2001. Local residents are migrating to larger urban areas in search of economic opportunities, higher quality-of-life, and so on. However, the ongoing COVID-19 pandemic has disrupted daily life much more so in larger urban areas than in mid-sized urban areas. This might have profound implications for future patterns of regional migration and settlement. "Internal migration resulted in a net loss of 11,200 people from Australia's capital cities in the September quarter of 2020…At the same time, some regional areas experienced significant growth in house prices as demand for properties increased" (Davies 2021). Observational data on migration and settlement patterns collected before the pandemic can only offer limited insights at best on future preferences for settlement in urban and regional centres.

As an alternative, we propose using Stated Preference (SP) experiments to collect data from participating individuals to measure their preferences for settlement in urban and regional centres. Study participants will be presented multiple scenarios where they are offered the choice to live between two or more competing urban centres. These urban centres will differ in terms of their education and employment opportunities, housing costs, climate and natural environment, cultural amenities, threat of natural disasters, and so on. For each scenario, participants will be asked to indicate the option that they most prefer. Alternative attributes will be systematically manipulated across scenarios, to understand how different individuals value each of these attributes differently. More details follow in subsequent sections of this report.

SP experiments are not subject to the same sources of bias as real-world market data. In fact, SP experiments offer perfect control—each of the variables of the decision context are defined explicitly by the analyst, and there are no omitted variables and no measurement error (Mitchell and Carson 2013; Louviere et al. 2000). In addition, SP experiments offer a basis for predicting the impact of structural breaks, such as the COVID-19 pandemic, on future regional settlement and migration patterns. SP experiments do this by incorporating these breaks as additional control variables.

However, the use of SP experiments has been criticised by traditional economists based on concerns around incentive compatibility and hypothetical bias (such as Diamond and Hausman 1994). It has been argued that due to the hypothetical nature of SP experiments, participants don't have any incentives to reveal their true preferences. Consequently, preferences measured using SP experiments are subject to hypothetical bias (such as Collins and Vossler 2009; Fifer et al. 2014). However, some of these concerns can be addressed by making the experiment design as credible and realistic as possible, so that study participants can provide meaningful responses.

These limitations notwithstanding, due to the advantages articulated previously, SP experiments have emerged as a popular technique for the measurement of consumer preferences across a wide variety of empirical contexts, such as transportation, environment and marketing. As Louviere et al. (2000: 21) write, "since the 1960s, many organisations worldwide have relied on some form of SP data to address this need, and it should be obvious to even the most obdurate economists that such a practice would not have persisted this long, much less increased many-fold, if organisations did not see value in it." However, to the best of the research team's knowledge, ours is the first application of SP experiments to the study of individual preferences for regional settlement and migration.

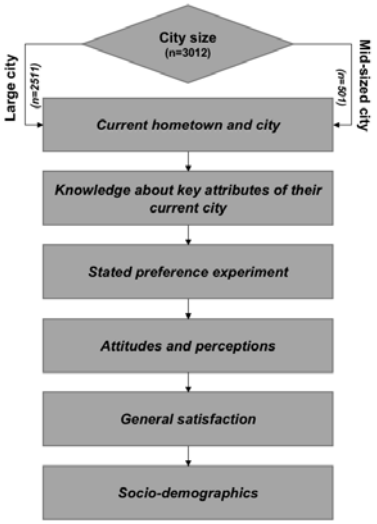
4.2 Survey instrument

We designed an online survey instrument to measure individual preference for settlement in urban and regional centres. The survey comprised six sections. Figure 14 shows the structure of the survey instrument. Over following paragraphs, we describe each section of the instrument in greater detail:

1. **Current hometown and city:** In this section of the survey, respondents were asked about their current city of residence, other Australian cities they have lived in the past for more than one year, their duration of residence in each city, and their purpose for moving to that city.
2. **Knowledge about key attributes of their current city of residence:** In this section of the survey, respondents were tested about their knowledge of different social, economic and environmental indicators of the city in which they live. In particular, for their current city of residence, they were asked the following nine indicators: (1) distance to the coast; (2) population size; (3) unemployment rate; (4) urban centre classification across six different categories (e.g. agricultural city, industrial city); (5) average home sales value; (6) average annual full-time wage rate; (7) average daily commute time; (8) average cost of living for a single person, excluding rent; and (9) climate classification. At the end of this section, the correct information for each of the indicators was revealed, so respondents could compare their answers.
3. **Stated preference experiment:** In this section of the survey, respondents were presented eight hypothetical scenarios where they were offered a choice between living in a large city (population greater than 100,000) versus living in a mid-sized city (population less than 100,000), such as the example shown in Figure 15. Both urban areas were described in terms of the same nine indicators mentioned in the previous section. Respondents were asked to indicate the urban area that they would prefer to live in. As a baseline for comparison, each scenario also presented values for the same nine indicators for their current city of residence. The values of each attribute were systematically varied across scenarios across the ranges shown in Table 11, based on a block efficient design generated using the software Ngene (Choice Metrics 2009). Appropriate constraints were used to ensure attribute combinations make sense. The final experiment design comprised 144 unique scenarios split across 18 blocks. Respondents were randomly assigned to one of the 18 blocks. Note that respondents were presented a glossary with definitions for each of the attributes, and specific values where relevant (e.g. urban centre classification, climate classification), with examples.

4. **Attitudes and perceptions:** In this section of the survey, respondents were asked about the importance of different factors to them when selecting and/or avoiding a city to live in, such as economic and education opportunities, quality-of-life, access to urban and natural amenities, and incidence of natural disasters. Respondents were asked about the importance of these same factors for why they may not want to leave their current city of residence. Respondents were asked about their perceptions of a mid-sized city and a large city in terms of these different factors. Finally, respondents were presented a list of policies that could support regional migration, such as support for employment, home ownership, etc., and asked to indicate the policies that would encourage them to stay/move to mid-sized cities.
5. **General satisfaction:** In this section of the survey, respondents were asked about their satisfaction with different aspects of their life.
6. **Socio-demographics:** In the final section of the survey, respondents were asked about their age, gender, indigeneity, country of birth, education, employment, place of residence, household size and structure, and income.

Figure 14: Structure of online survey instrument



Source: Author research.

Figure 15: Example scenario from the stated preference experiment

Imagine that you could choose to relocate to either of the following two urban areas. Which would you prefer to relocate to? For reference, we show the same attributes for your current city of residence.

Hover your cursor over the ⓘ symbol for further information.

	City 1	City 2	Adelaide
ⓘ Distance from the coast	200 km	On the coast	11 km
ⓘ Population size	100,000	500,000	1,165,639
ⓘ Unemployment rate	6%	6%	8%
ⓘ Urban centre classification	ⓘ Mixed function city	ⓘ Mixed function city	ⓘ Mixed function city
ⓘ Average home value	$650,000	$1,040,000	$474,099
ⓘ Average annual income	$85,000 per annum	$60,000 per annum	$73,118 per annum
ⓘ Average daily commute time (to and from work)	50 min	70 min	50 min
ⓘ Average monthly cost of living per person (excluding housing)	$1,300 per month	$1,400 per month	$1,200 per month
ⓘ Climate condition	Cool temperate	Hot humid summer, warm winter	Mild temperate
I would prefer to relocate to this city:	○	○	

Source: Author research.

Table 11: Range of attribute values used in our SP experiments to describe each urban area across different scenarios

#	Attribute	Range of values
1	Distance to coast	on the coast; 37.5 km, 75km, 200km, 600km
2	Population size: mid-sized cities	5k; 10k; 25k; 50k; 75k; 100k
	Population size: large cities	250k; 500k; 750k; 1m; 1.5m; 2m; 2.5m; 5m
3	Average annual income per person	$55k, $60k, $65k, $70k, $75k, $85k, $90k, $100k
4	Unemployment rate	3%, 5%, 7%, 9%, 11%, 13%, 15%
5	Urban centre classification	industry city; service city; connected city; coastal lifestyle city; mixed function centre; agricultural city
6	Average home sales value	$240k, $400k, $560k, $650k, $720k, $880k, $1.04m, $1.2m
7	Average daily commute time (minutes)	20, 30, 40, 50, 60, 70, 80, 90
8	Average monthly cost of living for single person (excluding rent)	$1k; $1.1k; $1.2k; $1.3k; $1.4k; $1.5k
9	Climate classification	hot humid summer, warm winter; warm humid summer, mild winter; hot dry summer, warm winter; hot dry summer, cool winter; warm temperate; mild temperate; cool temperate; alpine

Source: Author research.

The survey concluded with an open text question to elicit any feedback from respondents about the survey itself. Overall, the survey received positive feedback and respondents' comments highlighted that they were engaged with the topic.

4.3 Data collection

The survey was administered from 2 to 15 February 2021 through a web-based interface to a sample of 3,012 respondents 18 years and over from across Australia. Respondents were recruited to represent the Australian population demographically (age, gender and income) and as well as geographically (i.e., proportion of the population by state and proportion residing in a large or mid-sized city).

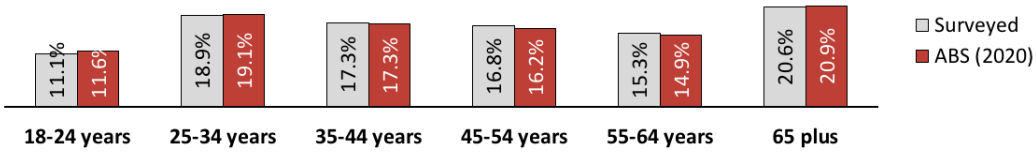
We compare our sample distribution with the distribution of the general Australian population in 2020 as estimated by the ABS across these key demographic and geographic variables. Figure 16 compares the marginal distributions across different age groups. Figure 17 compares the joint distributions across different gender and age groups. The marginal distributions across both age and gender for our sample are quite similar to the 2020 ABS projections. The average age of our sample is 47.0 years, whereas the average age of individuals ages 18 years and above per the ABS is 46.5 years. Similarly, 50.9 per cent of the sample is female, compared to 50.5 per cent of the general population. However, when we compare the joint distribution, the differences are more prominent. Younger men and older women are slightly overrepresented in our sample compared to the Australian population. However, we can control for these differences through appropriate reweighting procedures in our analyses.

Figure 18 compares the marginal distributions for household income across different income quintiles, where they are defined such that the top earns as much as the other 80 per cent of households combined. As a ratio, households earning in the highest quintile on average earn 9.5 times the average bottom quintile income. As is apparent from the plot, the two distributions are in close agreement. Relatedly, average household incomes for our sample are $1,667 per week, whereas the average earnings for full-time adults in Australia in May 2020 were $1,714 per week.

Finally, Table 12 compares the marginal distributions across different Australian states and territories. Again, the distribution for our sample is in close concordance with the corresponding distribution for the Australian population, as estimated by the ABS. Furthermore, based on the Urban Centres and Localities (2016) data, 83.4 per cent of the Australian population was living in a large city (with a population greater than or equal to 100,000), and 16.6 per cent was living in a mid-sized city (with a population less than 100,000). Our sample has the same exact distribution.

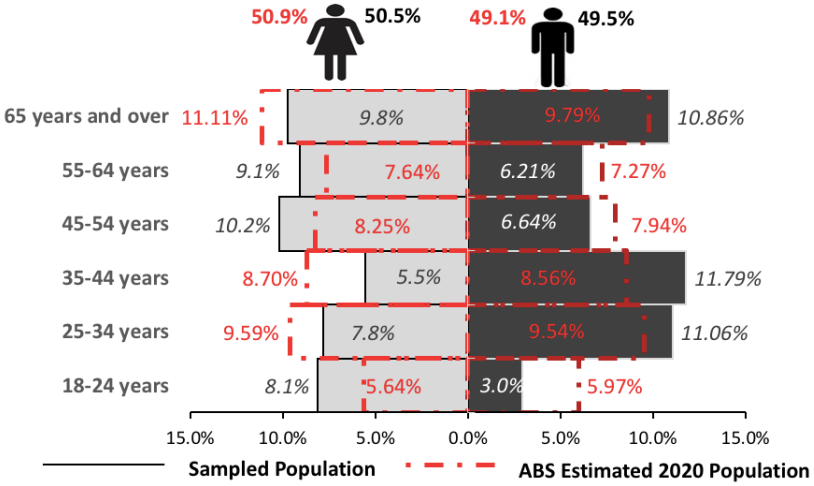
In summary, we conclude that our sample is roughly demographically and geographically representative of the Australian population. Therefore, findings from our formal analyses of this data should offer credible and robust estimates of preferences of the Australian population for settlement in urban and regional centres. Regardless, any differences between our sample and the general population will be controlled for in our analyses through appropriate reweighting procedures.

Figure 16: Sample and ABS distributions across different age groups



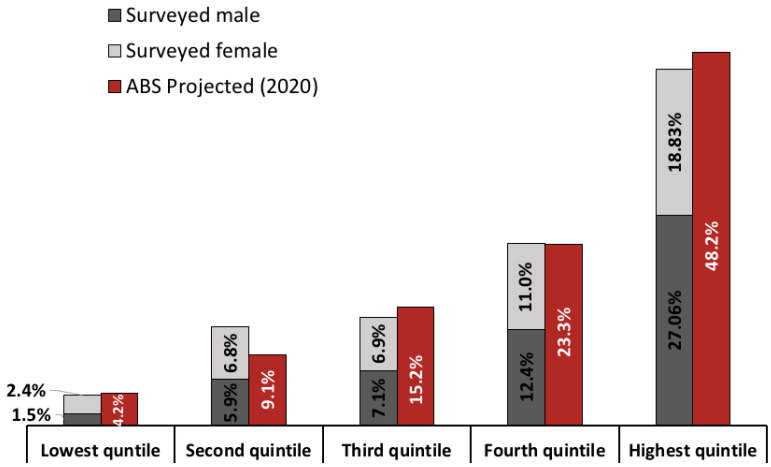
Source: Author research.

Figure 17: Sample and ABS distributions across different gender and age groups



Source: Author research.

Figure 18: Sample and ABS distributions across different income quintiles



Source: Author research.

Table 12: Sample and ABS distributions across different Australian states and territories

State or territory	Sample	ABS (2020)
Northern Territory	0.6%	1.0%
Australian Capital Territory	1.8%	1.7%
Tasmania	2.1%	2.1%
South Australia	7.6%	6.9%
Western Australia	10.1%	10.4%
Queensland	20.6%	20.1%
Victoria	24.6%	26.1%
New South Wales	32.6%	31.8%

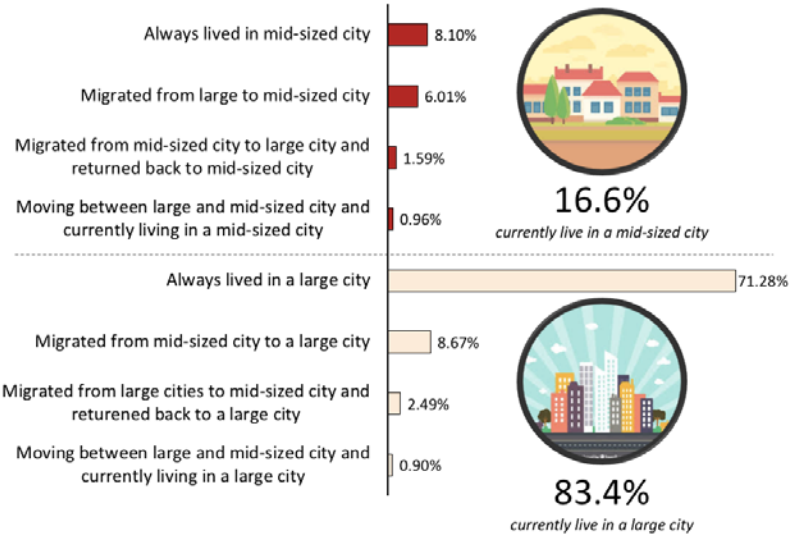
Source: Author research.

4.4 Descriptive analysis

As mentioned previously, 83.4 per cent of our respondents indicated that they are currently living in a large city (i.e. population greater than 100,000), and only 16.6 per cent are living in a mid-sized city (i.e. populations between 5,000 and 99,999).

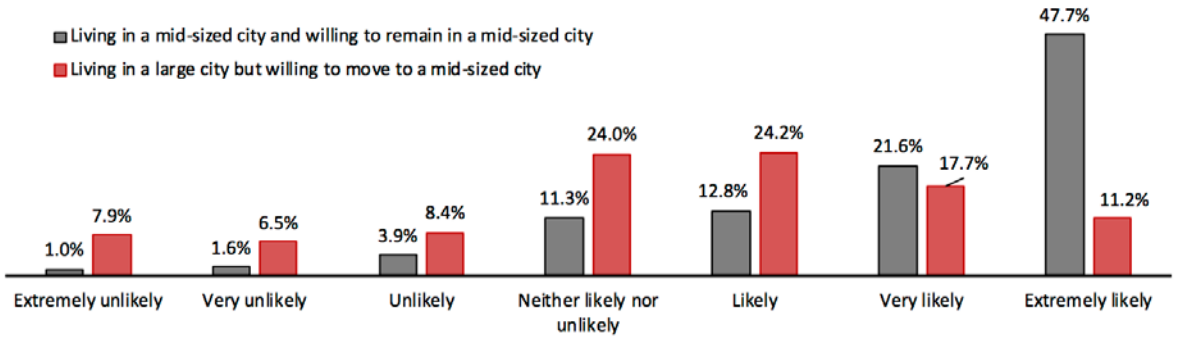
Respondents were subsequently asked to provide the names of other Australian cities they have lived in previously for more than 12 months, the main purpose for residing in that city, and the length of their stay. Based on respondents' answers, we identified different patterns with respect to settlement and migration patterns, and their relationship with city size, as shown in Figure 19. Approximately 71 per cent of our respondents have always lived in a large city, whereas only 8 per cent have always lived in a mid-sized city. Meanwhile, 9 per cent have migrated from a mid-sized city to a large city, while a lower 6 per cent have migrated from a large city to a mid-sized city. In general, the majority of mid-sized city residents have lived in a large city at some point in their past, but the majority of large city residents have lived in large cities their entire lives. Across our sample, 29 per cent have lived in a mid-sized city at some point in their lives.

Figure 19: Migration patterns as a function of current city of residence



Source: Author research.

Figure 20: Likelihood of staying in or moving to a mid-sized city



Source: Author research.

Table 13: Respondents mean and median of length of stay in each Australian city

	Total sample	Large cities	Mid-sized cities
Mean	18.9 years	20.9 years	12.9 years
Median	13.0 years	16.0 years	8.0 years

Source: Author research.

For comparison, Figure 20 plots respondents' willingness to continue living in a mid-sized city if they live in one already, or their willingness to move to one if they presently reside in a large city. Of those currently living in a mid-sized city, 82 per cent indicated that they are willing to remain living in a mid-sized city and only 7 per cent indicated that they are unlikely to remain. On the other hand, of those who are currently living in a large city, 53 per cent indicated a willingness to move to a mid-sized city, and only 22 per cent indicated that such a move would be unlikely. In summary, these statistics suggest that a majority of Australian residents are open to the prospects of living in mid-sized cities.

Table 13 shows the mean and median length of stay in a single city as a function of its size. On average, across all city sizes, respondents indicated that on average they move cities every 18.9 years. However, numbers vary quite significantly between large and mid-sized cities. Large city residents have an average length of stay of 20.9 years, compared to 12.9 years for mid-sized city residents. Based on these responses, it appears that larger cities offer more stable living conditions that afford the opportunity for households to settle for longer periods. In contrast, mid-sized cities appear to be less stable, resulting in greater attrition of local residents.

Table 14 shows how reasons for migration and settlement patterns have varied across individuals with different histories. Across our entire sample, employment and proximity to family are the two most popular reasons for why individuals choose to live in a particular city. However, there are some interesting differences when we examine this information further, based on migration histories. As one would expect, individuals that have always lived in either a mid-sized city or a large city have most frequently done so to be close to family. Reasons for moving to a mid-sized city tend to include better quality of life, more affordable housing, and better prospects to raise children. In contrast, reasons for moving to a large city tend to focus on employment and education opportunities.

Relatedly, respondents were asked about the importance of different factors in general, when deciding what city to live in, and their responses are shown in Figure 21. Interestingly, quality of life, quality of healthcare, crime rate, cost of living, and housing costs are rated as the five most important factors. Proximity to family and employment are only the sixth and seventh most important factors, respectively. In combination with responses to previous questions, it appears that while factors relating to quality of life are important determinants of where individuals choose to live, they are not always the precipitating factor that causes individuals to move to another city.

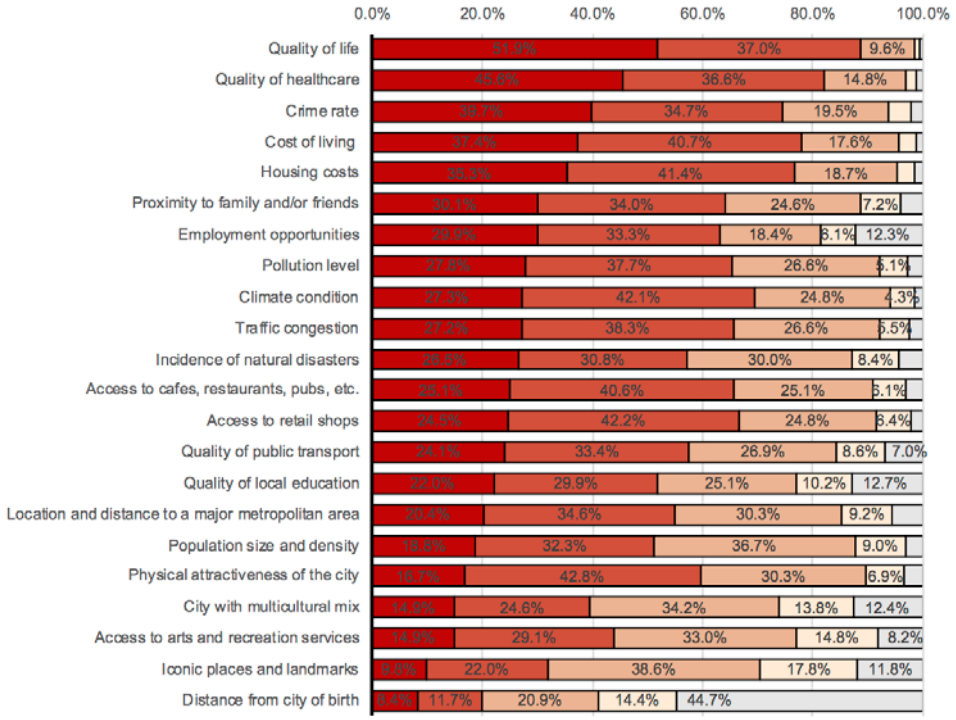
We conducted a factor analysis on the importance of the 22 characteristics listed in Figure 21, and we identified four distinct factors. Figure 22 enumerates these factors, the characteristics generating them, the average importance score of these characteristics, and the distribution. Consistent with Figure 21, characteristics pertaining to quality of life and employment and education opportunities are the most important, and characteristics pertaining to urban amenities, culture and heritage are the least important. In our formal econometric analysis, we use these four factors as explanatory variables to explain differences in individual preferences for settlement patterns.

Table 14: Reasons for settlement in different cities, as a function of migration histories

Reason for move	Full sample	Currently living in a mid-sized city (16.6%)					Currently living in a large city (83.4%)				
		Always lived in mid-sized cities	Migrated from large to mid-sized cities	Migrated from mid-sized cities to large cities and returned back to mid-sized cities		Moving between large and mid-sized cities (currently living in a mid-sized city)	Always lived in a large city	Migrated from mid-sized cities to large cities	Migrated from large cities to mid-sized cities and returened to a large city		Moving between large and mid-cities and currently living in a large city
				Reason for move to large city	Reason for return to mid-sized city				Reason for move to mid-sized city	Reason for return to large city	
Employment and industry related issues	27.3%	22.4%	23.2%	31.3%	31.3%	38.0%	17.3%	29.1%	42.7%	29.3%	37.6%
Being close to family	21.2%	32.5%	23.2%	8.3%	18.8%	21.5%	31.1%	18.8%	16.0%	17.3%	14.0%
Place of birth	10.9%	8.4%	20.4%	10.4%	6.3%	6.3%	15.0%	21.8%	5.3%	22.7%	6.5%
Better quality of life	8.9%	10.3%	7.2%	4.2%	8.3%	8.3%	11.2%	1.1%	4.0%	8.0%	4.8%
Education	8.0%	5.2%	8.3%	18.8%	10.4%	3.9%	6.7%	13.8%	9.3%	8.0%	5.4%
More affordable housing	5.1%	5.7%	7.2%	8.3%	2.1%	5.9%	3.2%	2.3%	5.3%	2.7%	2.7%
Attractive environment	3.7%	3.2%	2.8%	2.1%	4.2%	2.9%	3.0%	1.5%	2.7%	2.7%	7.0%
Higher income	2.1%	1.5%	0.6%	2.1%	2.1%	0.0%	1.6%	1.9%	1.3%	1.3%	2.7%
Better prospects to raise children(s)	1.6%	1.5%	0.6%	4.2%	2.1%	1.5%	1.8%	1.1%	1.3%	0.0%	1.1%
Better services (e.g. healthcare, banking, retail, etc.)	1.3%	1.2%	0.6%	0.0%	0.0%	0.5%	1.7%	0.4%	2.7%	1.3%	2.7%
Health related reasons	1.2%	0.0%	0.6%	0.0%	2.1%	0.0%	0.6%	0.8%	1.3%	0.0%	2.7%
Live in community with similar backgrounds	1.0%	1.5%	1.1%	0.0%	0.0%	1.5%	0.5%	0.0%	0.0%	1.3%	1.6%
Greater sense of community and belonging	1.0%	1.2%	0.0%	0.0%	2.1%	1.0%	1.1%	0.8%	0.0%	0.0%	2.2%
Amenities and entertainment facilities	0.8%	0.2%	0.6%	0.0%	0.0%	1.5%	0.8%	0.8%	0.0%	0.0%	2.7%

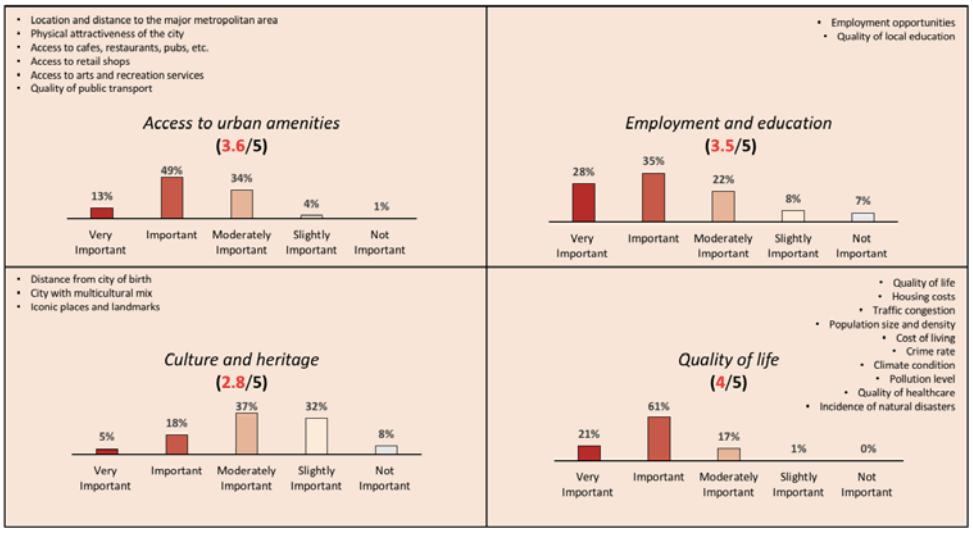
Source: Author research.

Figure 21: Importance of different characteristics when deciding on a city to live in



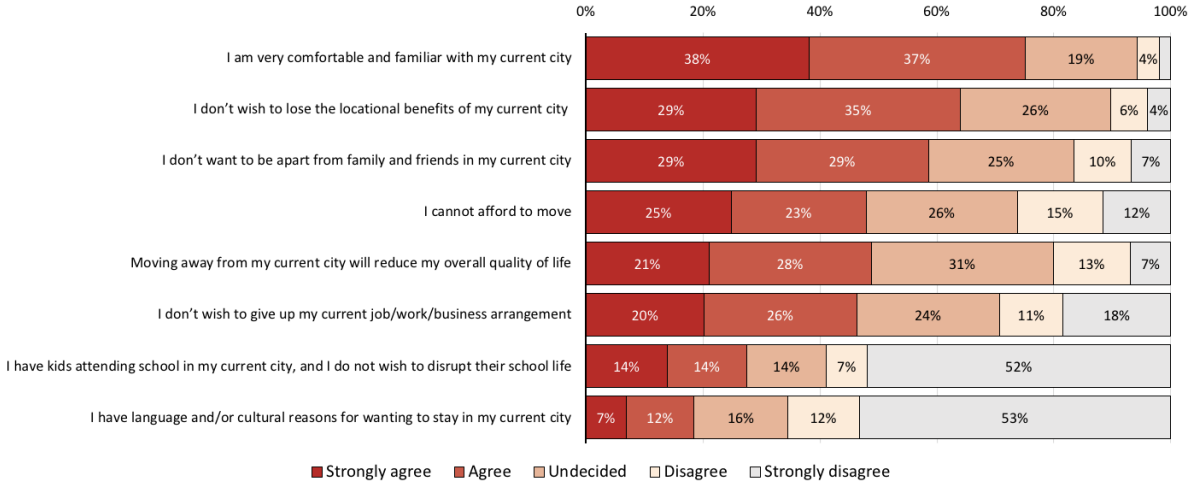
Source: Author research.

Figure 22: Four key factors identified from a factor analysis of respondent importance ratings of 22 different characteristics to their decision on which city to live in



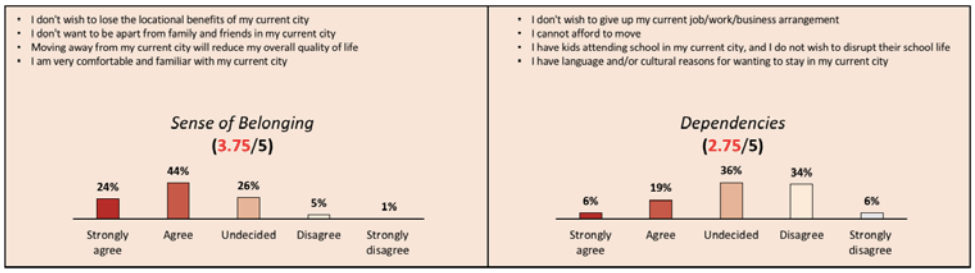
Source: Author research.

Figure 23: Importance of different reasons for not wanting to leave present city of residence



Source: Author research.

Figure 24: Two key factors identified from a factor analysis of importance ratings of 8 different reasons for why respondents would not want to leave their present city of residence



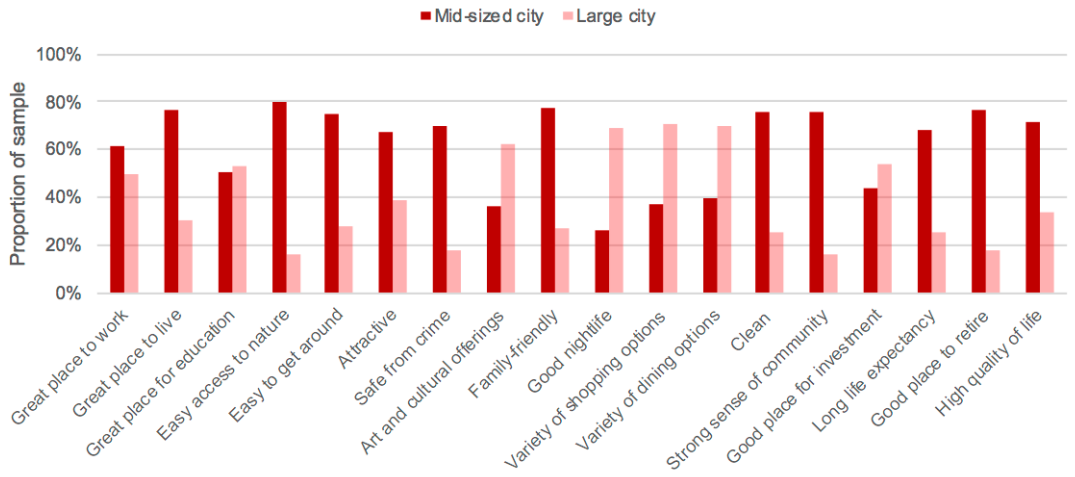
Source: Author research.

Similarly, respondents were asked about reasons that prevent them from moving away from their present city of residence, and their responses are shown in Figure 23. Comfort and familiarity, access to locational benefits and proximity to family and friends were cited as the three most important barriers. Again, we conducted a factor analysis on these characteristics to identify two main factors that act as barriers to potential relocation. These are shown in Figure 24. The first factor relates to sense of belonging, while the second factor captures dependencies. As before, we use these factors as explanatory variables in our formal econometric analysis described in subsequent sections.

Respondents were asked to select the characteristics they think best describe a mid-sized city and a large city. In total, eighteen characteristics were presented to respondents. Figure 25 plots the proportion of respondents that selected a particular characteristic to describe mid-sized cities and large cities. Consistent with responses to previous questions, respondents perceive mid-sized cities to offer better quality of life, and large cities to offer better access to urban amenities.

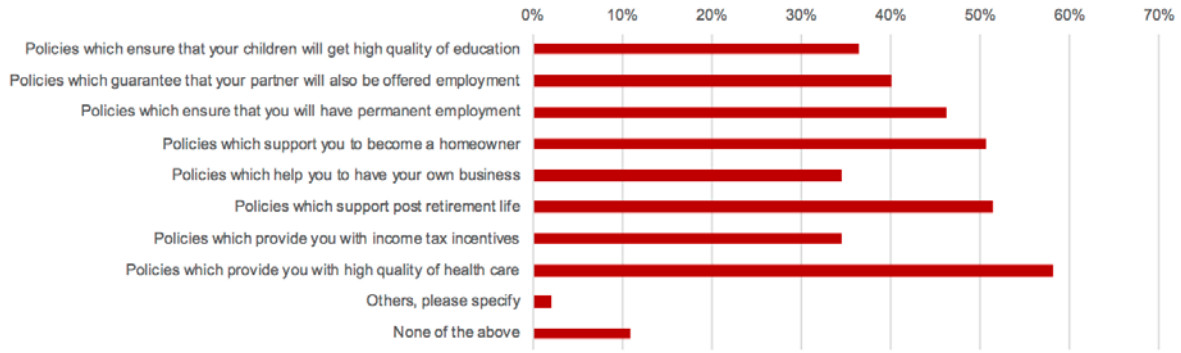
Respondents were presented eight different types of policies that local, state and national governments may use to encourage settlement in mid-sized cities, and asked to indicate which of these policies would encourage them to move to a mid-sized city. The responses are shown in Figure 26.

Figure 25: Proportion of respondents that used particular characteristics to describe mid-sized cities and large cities in general



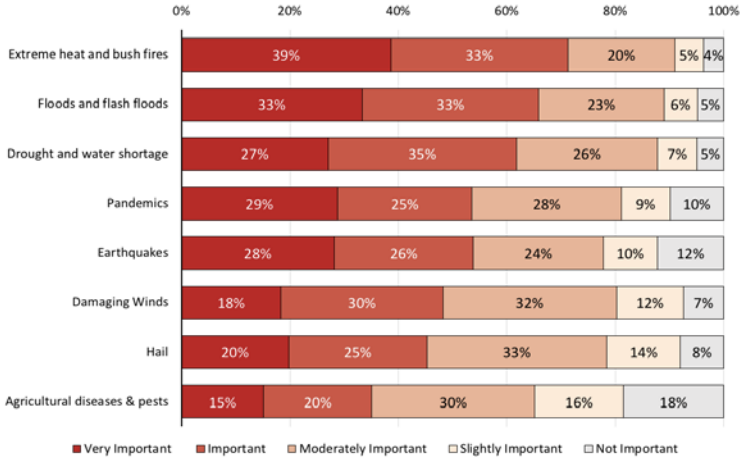
Source: Author research.

Figure 26: Proportion of respondents that agreed that the particular policy would encourage them to relocate to a mid-sized city



Source: Author research.

Figure 27: Importance of potential threat from different natural disasters, when deciding on a city to live in



Source: Author research.

The most popular policies pertain to provision of high quality healthcare and support for post-retirement living, indicating that the majority of respondents in our sample view mid-sized cities as potential places of residence for when they are older and retired from the workforce.

Finally, given the Australian bushfires in 2019–20 and the ongoing COVID-19 pandemic, we asked respondents to rate the importance of potential threats from different natural hazards, when deciding what city to live in. Figure 27 plots the responses. In general, a majority of respondents rate potential threats from most natural hazards to be an important factor. In terms of relative importance, threats from the following four natural hazards are perceived to be the greatest, in descending order:

1. extreme heat and bushfires
2. floods and flash floods
3. drought and water shortage
4. pandemic.

In our subsequent analysis, we examine if and how these attitudes have an impact on preferences for settlement and migration.

4.5 Estimation results

Each survey respondent in our sample was presented eight SP scenarios, where they were offered a choice between living in two different urban areas, and asked to indicate their preference. Data from these hypothetical scenarios was used in conjunction with other demographic and migration information collected as part of the survey to estimate Latent Class Choice Models (LCCMs) of individual preferences for settlement in urban and regional centres.

LCCMs are finite mixtures of discrete choice models. They were first developed in the field of marketing sciences as tools to identify relatively homogenous consumer segments that differ substantially from each other in terms of their behaviour in the marketplace (Kamakura and Russell 1989). They have since emerged as a very popular form of discrete choice model, finding application in a wide variety of disciplines. In our case, LCCMs allow us to identify segments in the population that differ in terms of their preferences for different urban areas. We describe the general LCCM framework in Appendix A.

We estimated a number of LCCMs with different model specifications, where we varied the explanatory variables, the functional form of the utilities, and the number of classes. Our dataset comprised 3,012 individuals, each of whom were shown eight different choice scenarios. To facilitate comparison, Table 15 enumerates for each model the number of parameters estimated, the log-likelihood at convergence, the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC) and Consistent AIC (CAIC). Based both on statistical measures of fit and behavioral interpretation, we select the four-class LCCM as the preferred model specification. In terms of fit, the four-class LCCM has the lowest AIC, BIC and CAIC, and therefore performs the best. In terms of the signs and relative magnitudes of the different model parameters and the accompanying behavioral interpretation of each of the latent classes, results for the four-class LCCM also proved to be the most satisfying.

Table 16 presents estimation results for the class-specific choice model of city preferences, and Table 17 and Table 18 present estimation results for the class membership model for the four-class LCCM. The class-specific choice models included the city-specific attributes shown in the SP experiments as the explanatory variables $\mathbf{x}_n$. The class membership model included various individual-specific characteristics as the explanatory variables $\mathbf{z}_n$, such as demographic variables, current place of residence, past settlement history, and attitudes towards settlement in urban and regional areas. To enable comparison of the marginal effects of different city characteristics on settlement choices, Table 19 further enumerates average demand elasticities with regards to each of the continuous variables in the class-specific model.

Table 15: Summary statistics for LCCMs with varying numbers of classes

Classes	Parameters	Loglikelihood	AIC	BIC	CAIC
2	86	-14,719	29,609	29,736	29,695
3	171	-14,519	29,381	29,634	29,552
4	256	-14,319	29,150	29,528	29,406
5	341	-14,272	29,226	29,730	29,567

Source: Author research.

To underscore behavioural differences across classes, a sample enumeration is conducted. For each individual in our sample, we calculate their posterior class membership probabilities based on their indicated choices to each of the eight scenarios. To arrive at the expected size of each class, the class membership probabilities are summed across individuals. The posterior probabilities are also used to calculate the average class-specific value for different explanatory variables, which are used further to profile the different classes. The results from this exercise have been incorporated in our description of each of the classes over the following paragraphs.

It is worth reemphasising that uncovering the number of classes and the underlying behaviour of each class is based on a comprehensive exploratory process, where we varied the explanatory variables, the functional form of the utilities, and the number of classes. For the final model specification presented here, we have removed any model parameters with a p-value greater than 0.2 from the model. To make the description of classes easy to follow, we have ordered the classes in terms of decreasing preferences for living in large metropolitan cities, and increasing preferences for living in regional mid-sized cities. Table 20 summarises these key differences across the four classes.

- **Class 1:** Comprising 16 per cent of the sample population, individuals belonging to this class display a distinct preference for living in large cities. These individuals are highly sensitive to average wages in a city when deciding where to live, as reflected by a high demand elasticity of 1.6–5.1. The impact of other characteristics is not found to be statistically significant. Individuals belonging to this class tend to be young higher-income urban professionals living alone or with their partners in households without children. These individuals have lived in large cities for most of their lives, and express reluctance to move to a mid-sized city.
- **Class 2:** Comprising 21 per cent of the sample population, individuals belonging to this class display a preference for living in smaller cities. These individuals are sensitive to unemployment rates, but the size of the marginal effect is small, as reflected by a low demand elasticity between -0.8 and -0.5. The impact of other characteristics is not found to be statistically significant. Individuals belonging to this class tend to be a mix of young individuals living by themselves or in shared households, and middle-aged individuals living in households with children. They are frequently university-educated, employed in full-time managerial or professional jobs in white-collar sectors such as information, media and telecommunications. These individuals have lived in large cities for most of their lives, but are open to the prospect of moving to a mid-sized city under the right circumstances. Across all classes, they place the greatest importance on employment and education opportunities, as well as physical attractiveness, the presence of iconic places and landmarks, and a multicultural mix of local residents. They report that policies encouraging relocation to mid-sized cities are most appealing when they support home ownership, ensure high quality of education, and offer some form of employment security.
- **Class 3:** Comprising 54 per cent of the sample population, individuals belonging to this class do not display a distinct preference for living in either mid-sized or large cities. Rather, their preferences are based on trade-offs across other city characteristics. Average wages and cost of living are the two most important attributes, followed by housing costs, commute times, unemployment rates, and distance to coast. Individuals belonging to this class dislike living in industrial or agricultural centres, and show a preference for mild temperate climates. Individuals belonging to this class tend to be older lower-income individuals without a university degree that are employed part-time or retired. These individuals are also open to the prospect of living in a mid-sized city under the right circumstances. One in three individuals belonging to the class have previously lived in a mid-sized city. They place a high importance on quality of life, quality of local healthcare, and housing and other living costs. They report that policies encouraging relocation to mid-sized cities are most appealing when they provide access to high quality of healthcare, and support post retirement life and home ownership.

- **Class 4:** Comprising 9 per cent of the sample population, individuals belonging to this class display a very strong preference for living in smaller cities, to the point where their preferences are seemingly insensitive to other city characteristics. As one would expect, these individuals are most likely to be presently living in a mid-sized city, and/or to have lived in one in the past. In terms of their demographic characteristics, they share a number of similarities with Class 3; individuals belonging to this class also tend to be older, lower-income, without a university degree, and/or employed part-time or retired.

Note that we had asked respondents the importance of the frequency of different natural disasters when assessing where to live. As reported in Section 4.4, a majority of respondents rated potential threats from most natural disasters to be an important factor. However, the level of importance placed by different respondents was not found to be statistically significantly correlated with differences in preferences for settlement in large or mid-sized urban areas. Therefore, we do not include them in our preceding discussion of the classes.

Table 16: Class-specific choice models of individual preferences for settlement in urban and regional centres

	Class 1		Class 2		Class 3		Class 4	
Variable	est	p-val	est	p-val	est	p-val	est	p-val
Large city constant	0.00	-	-0.125	0.01	-0.301	0.00	-∞	-
Population								
Less than 50,000	-0.573	0.00	0.141	0.00	0.000	-	Deterministic class	
50,000 – 100,000	-0.525	0.00	0.117	0.02	0.000	-		
100,000 – 500,000	0.441	0.00	0.000	-	0.000	-		
500,000 – 1,000,000	0.247	0.00	0.000	-	0.000	-		
More than 1,000,000	0.858	0.00	0.000	-	0.000	-		
Other attributes								
Distance from the coast (100 km)	-0.190	0.00	0.000	-	-0.215	0.00	Deterministic class	
Unemployment rate (%)	0.000	-	-0.029	0.01	-0.042	0.00		
Average home sales value ($100,000)	0.000	-	0.000	-	-0.082	0.00		
Average annual full-time wages ($100,000)	1.888	0.00	0.000	-	1.396	0.00		
Average daily commute time (hours)	0.000	-	0.000	-	-0.520	0.00		
Average monthly cost of living per person ($1,000)	0.000	-	0.000	-	-0.813	0.00		
Urban centre classification								
Industrial centre	0.000	-	0.000	-	-0.482	0.00	Deterministic class	
Agricultural centre	0.000	-	0.000	-	-0.398	0.00		
Climate								
Hot humid summer, warm winter	0.000	-	0.000	-	-0.320	0.00	Deterministic class	
Mild temperate	0.000	-	0.000	-	0.194	0.00		
Alpine	0.000	-	0.000	-	-0.482	0.00		

Source: Author research.

Table 17: Class membership model

	Class 1		Class 2		Class 3		Class 4	
Variable	est	p-val	est	p-val	est	p-val	est	p-val
Constant	Base class		1.645	0.04	3.091	0.00	-0.787	0.33
Age								
25–34 years	Base class	0.000	-	-0.553	0.01	0.000	-	
55–64 years		0.000	-	0.000	-	0.612	0.00	
Indigenous Australian								
Yes	Base class	0.000	-	-0.783	0.14	0.000	-	
Education								
Master's degree or equivalent	Base class	0.000	-	-0.472	0.07	-0.524	0.11	
Graduate Diploma		0.000	-	-0.419	0.10	0.000	-	
Bachelor's degree or equivalent		0.000	-	-0.412	0.01	0.000	-	
Household type								
Couple family with no children	Base class	-0.633	0.05	0.000	-	0.000	-	
Occupation								
Managers	Base class	0.964	0.00	0.000	-	0.000	-	
State of residence								
Western Australia		-0.767	0.14	0.000	-	-0.830	0.02	
Tasmania		0.000	-	0.836	0.17	0.000	-	
Australian Capital Territory		0.000	-	0.000	-	0.925	0.02	
Live in a large city								
Yes	Base class	0.000	-	0.000	-	-0.534	0.00	
Willing to move from large cities								
No	Base class	-0.678	0.14	-0.566	0.00	0.000	-	
Dwelling type								
House	Base class	0.000	-	0.232	0.18	0.000	-	
Semi-detached or townhouse		0.000	-	0.425	0.09	0.000	-	
Dwelling payment								
Monthly rent/mortgage ($1,000)	Base class	0.073	0.08	0.000	-	0.000	-	
Characteristics of current city of residence								
Mixed function urban centre	Base class	0.000	-	0.000	-	-0.534	0.00	
Unemployment rate (%)		0.000	-	-0.102	0.05	0.000	-	
Climate - hot humid summer, warm winter		0.000	-	-1.226	0.01	0.000	-	
Climate - warm humid summer, mild winter		0.000	-	-0.372	0.06	0.000	-	
Climate - warm temperate		0.000	-	-0.310	0.06	0.000	-	
Settlement and migration history								
Always lived in large cities	Base class	0.000	-	-0.874	0.00	-0.480	0.11	
Have moved from mid-sized cities to large cities		0.000	-	-0.639	0.04	0.000	-	
Have moved between large and mid-sized cities and currently living in a large city		1.188	0.25	0.000	-	0.000	-	

Source: Author research.

Table 18: Class membership model (continued)

	Class 1		Class 2		Class 3		Class 4	
Variable	est	p-val	est	p-val	est	p-val	est	p-val
Satisfaction level								
With employment	Base class	-0.225	0.08	0.082	0.23	0.000	-	
With financial situation		0.000	-	-0.202	0.01	0.000	-	
With state you live in		0.000	-	0.000	-	0.203	0.07	
With relationship with loved ones		0.261	0.09	0.000	-	0.000	-	
Barriers to migrate								
Comfort and sense of belonging	Base class	-0.997	0.00	-0.227	0.08	-0.400	0.01	
Dependencies		0.625	0.00	0.000	-	0.240	0.03	
Motivators to migrate								
Access to urban amenities	Base class	0.000	-	-0.532	0.00	-1.145	0.00	
Culture and heritage		0.386	0.04	-0.510	0.00	0.000	-	
Employment and education		0.000	-	0.158	0.04	0.000	-	
Quality of life		0.000	-	0.833	0.00	0.000	-	
Characteristics used to describe mid-sized and large cities								
Great place to live, work and study	Base class							
Mid-sized city		0.000	-	0.000	-	0.824	0.01	
Large city		-1.000	0.03	0.000	-	-0.84	0.00	
Variety of art and cultural offerings; good nightlife								
Mid-sized city		0.000	-	-0.336	0.22	0.000	-	
Large city		0.000	-	0.715	0.01	0.597	0.09	
Easy access to nature; easy to get around; attractive; safe; clean								
Large city		-0.947	0.06	-0.654	0.01	0.000	-	
Good place for investment; long life expectancy; good place to retire; high quality of life;								
Mid-sized city		0.000	-	0.998	0.00	0.000	-	
Large city		0.000	-	0.000	-	-0.909	0.01	
Policies to encourage move to mid-sized cities								
Employment guarantee for spouse/partner	Base class	-0.654	0.02	0.000	-	0.282	0.17	
Support for home ownership		0.510	0.09	0.000	-	0.647	0.00	
Support for post retirement life		0.000	-	0.423	0.00	0.000	-	
Income tax incentives		-2.316	0.11	-2.873	0.00	-0.299	0.14	

Source: Author research.

Table 19: Class-specific demand elasticities for residing in mid-sized or large cities with respect to different city characteristics

	Class 1		Class 2		Class 3		Class 4	
	Mid-sized city	Large city	Mid-sized city	Large city	Mid-sized city	Large city	Mid-sized city	Large city
Distance to coast	-0.50	-0.25	-	-	-1.14	-1.85	-	-
Unemployment rate	-	-	-0.58	-0.77	-1.47	-3.06	-	-
Average home sales value	-	-	-	-	-2.03	-7.30	-	-
Average annual full-time wages	5.06	1.57	-	-	5.11	10.66	-	-
Average daily commute time	-	-	-	-	-1.62	-6.11	-	-
Average monthly cost of living per person	-	-	-	-	-4.88	-10.46	-	-

Source: Author research.

Table 20: Narrative summary of different segments in the sample population

	Class 1 Metropolitan enthusiasts	Class 2	Class 3	Class 4 Regional enthusiasts
Share of sample population	16 per cent	21 per cent	54 per cent	9 per cent
Preferences for city size	Prefer larger cities.	Preference for smaller cities, ceteris paribus.	Neutral.	Very strong preference for smaller cities.
Sensitivity to other city characteristics	Care about wages, distance to coast, and access to urban amenities, insensitive to other attributes.	Care about unemployment rates, insensitive to other attributes.	In descending order of importance, sensitive to wages, living costs, housing costs, commute times, unemployment, and distance to coast.	Insensitive to any other city characteristics.
Settlement and migration history	Highly likely to have always lived in large cities, and reluctant to leave large cities.	Highly likely to have always lived in large cities, but open to moving.	Proportionally split between large and mid-sized city residents.	Most likely to be currently living in a mid-sized city, or have lived in one in the past.
Demographic characteristics	More likely to be younger, higher-income professionals that are single or part of a couple, and with no children.	More likely to be a mix of young individuals living in single or shared households, and middle-aged individuals living in households with children. Tend to be university-educated and employed full-time in high-wage managerial or professional jobs in white-collar sectors.	More likely to be older, lower-income individuals without a college degree that are employed part-time or retired.	

Source: Author research.

4.6 Policy implications

Our analysis identified four distinct segments, or classes, across the sample population, that differ in terms of their preferences for living in large and mid-sized cities. Based on our findings, we discuss how different policies may be targeted at different segments to encourage them to move to mid-sized cities.

- Classes 1 and 4, together comprising 25 per cent of the sample population, display distinct preferences for large and mid-sized cities, respectively, and appear unlikely to change their preferences.
    - Individuals belonging to Class 1 tend to be young urban professionals that value locational benefits from living in large cities, such as access to retail, food, art and cultural services, and are reluctant to give them up to move to a mid-sized city.
    - Individuals belonging to Class 4 tend to be older individuals that are employed part-time or retired, value quality-of-life benefits from living in mid-sized cities, such as lower housing costs and less traffic congestion, and are equally reluctant to give them up to move to a large city.
- Classes 2 and 3 comprise the remaining 75 per cent of our sample population, and appear more open to moving to a mid-sized city under the right circumstances.
    - Individuals belonging to Class 2 are more likely to be a mix of young individuals living in single or shared households, and middle-aged individuals living in households with children. They tend to be university-educated and employed full-time in high-wage managerial or professional jobs in white-collar sectors. Across all classes, they place the greatest importance on employment and education opportunities. They are likely to move to mid-sized cities if they could offer comparable opportunities.
    - Individuals belonging to Class 3 are more likely to be older, and employed part-time in lower paying jobs, or retired from the workforce. They place a high importance on quality of life, quality of local healthcare, and housing and other living costs. They view mid-sized cities as excellent places to retire, and would be encouraged to move there if they could get support for post retirement living in terms of healthcare and home ownership.

5. Policy development options

The potential of Australia's smaller cities in managing the growth and distribution of Australia's population has been acknowledged by both governments (DoHE 1983) and academic researchers (Beer et al. 1994) for more than four decades. Despite this recognition, Australians have continued to cluster in the capitals, where population grew by 10.5 per cent between 2011 and 2016, compared with 5.7 per cent for the regions. Much of this capital city growth has been driven by immigrant arrivals. Since the mid 1980s, 85 per cent or more of all new arrivals have settled in the capitals, with some 60 per cent choosing Sydney and Melbourne (Hugo and Smailes 1985).

Efforts to develop smaller cities have been hindered by the absence of a consensus on whether (Daley and Lancy 2011) and how (Beer 2012) to develop places outside the capital cities. Australia has followed a number of economic growth paradigms over the past 40 years, including perspectives informed by growth pole theory, approaches based on market liberalisation and globalisation, endogenous growth perspectives and policy perspectives drawn from the OECD (2009) that have emphasised infrastructure investment and the development of human capital. The absence of a coherent and consistent policy framework driving the growth of regional Australia has meant many parts of non-metropolitan Australia, have either not grown or have experienced population decline. This has been attributed to a mix of weak economies, diminished service provision and employment opportunities and ongoing out-migration, especially among the young (McKenzie 1996).

There has been ongoing debate about the most appropriate mix of policies to encourage the growth of regions (Productivity Commission 2017), especially those regions lagging nationally. This study contributes to this debate through an examination of the determinants of migration flows and settlement patterns within Australia. Based on our analysis described in preceding chapters, we have identified three broad ways in which government policies could enable population decentralisation and encourage settlement in mid-sized regional cities. Over subsequent sections, we describe each of these approaches in greater detail.

5.1 Develop local employment opportunities

The first path focuses on developing local employment opportunities in regional centres. Our analysis finds that roughly one in five Australians is open to moving to a mid-sized city if it could offer comparable employment and education opportunities to large cities. These individuals are more likely to be middle-aged and employed full-time in high paying managerial or professional jobs in white-collar sectors, living in households with children. Supporting policies could focus on the creation of local jobs (by offering appropriate incentives to employers to locate in these areas) and working with local communities to aid emerging local industries. The widespread adoption of remote working arrangements during the COVID-19 pandemic, and their potential continuation after the pandemic, offers new opportunities for encouraging settlement in mid-sized cities that offer better quality-of-life. Policies that support the adoption and continuation of remote working arrangements—used in conjunction with policies that offer higher quality-of-life in regional centres—could further help attract these individuals.

However, past government policies that have followed the first path have met with limited success. For example, in the 1970s the Whitlam Government tried to develop regional centres, such as Albury–Wodonga, as suitable sites for population growth and decentralisation, but most of these centres failed to emerge as major population hubs (Beer 2000). Some studies have argued that local, state and national governments have limited capacity to influence regional economic outcomes (such as Sorensen 2000; 1993). Consequently, the ability of governments to be able to create the kinds of employment opportunities that would attract residents from large cities is questionable. It is possible that COVID-19 could fundamentally alter settlement preferences, but it is too soon to tell how large these shifts are likely to be, and how long they will persist.

Others have contended that there is a need to move away from conventional 'top-down' regional policies, to embrace place-based policies that are tailored to the needs of each locality (Pugalis and Gray 2016; Beer et al. 2021). Such programs of government action emphasise the capacity to grow through the further development of a community's existing resources—endogenous development—rather than by attracting external investment. Similarly, the OECD (2019) has argued for the adoption of place-based polices because 'they help all regions use their full economic potential. Place-based policies are an indispensable complement to structural economic policies because structural economic policies do not consider specific regional factors adequately' (OECD 2019: 15).

Over the past decade increased attention has been paid to place-based policy making, particularly in the European Union and a number of other nations. It has been applied to a wide-range of policy domains, including the emergence of place-based leadership, industry policy, innovation and in managing the impacts of economic shocks and economic transition. There is a growing movement towards place focussed industry policies. Other areas of convergence include the development of industry clusters, the creation of entrepreneurial ecosystems, the implementation of smart specialisation and the development of spatially bound infrastructure programs. Many or all of these initiatives can be identified as examples of place-based policy, and could provide an alternative approach to developing local employment opportunities in regional centres.

5.2 Develop higher education institutions

The second path focuses on developing local education opportunities in regional centres. Mid-sized urban areas have seen very high out-migration of young adults (individuals in the age group 18–29 years). On average, these urban areas have had net out-migration rates of 30 per cent for young adults over the period 2011–16, and the trend has been similar over preceding five-year periods. Our analysis finds that these individuals place the greatest importance on education opportunities. They report that policies encouraging relocation to mid-sized cities are most appealing when they support home ownership, ensure high quality of education, and offer some form of employment security.

There is substantial international literature on the importance of knowledge-based employment as a basis for strengthened economic performance, including the role of universities in both providing local knowledge employment and contributing to knowledge spillovers (Drucker and Goldstein 2007; Harrison and Turok 2017). Our findings confirm that recent policies such as the Job-Ready Graduates Package—that invest significantly in higher education in regional Australia—could help retain a greater proportion of young adults in mid-sized urban cities, and help grow their economies.

National and state government policies could further leverage other streams of funding to further support the growth of education and knowledge-intensive business services in smaller cities. For example, one potential source could be research block funding for the university sector. Much of this funding is currently directed to metropolitan institutions, because of the ways in which performance formula are constructed. Some of this funding could be tied to university campuses in the regions. This could drive universities to move staff and facilities to these locations, with the change taking place over a period to remove the prospect of a policy-induced shock. This may offer the further advantage of freeing up valuable inner urban land for redevelopment.

5.3 Develop infrastructure for post-retirement living

The third path focuses on developing selected regional centres as retirement hubs. Our analysis finds that roughly one in two Australians view mid-sized cities as excellent places to retire, and would be encouraged to move there if they could get support for post retirement living in terms of healthcare, home ownership and access to other amenities. Our analysis further indicates that coastal cities that are in close proximity to a major metropolitan centre tend to be especially attractive retirement destinations. The ability of mid-sized urban cities to attract older Australians could have significant positive implications for their local economies. "This cohort [of older Australians] will be the most educated, diverse, and wealthy with an unparalleled body of experience and regional areas should seek to develop innovative ways to utilise them for the social and economic sustainability of their communities" (Hugo et al. 2015: 8). Our analysis echoes these findings, and offers evidence in support of policies that seek to develop mid-sized urban cities as retirement destinations as a way of reviving local population growth and regenerating local economic activity. Policies that promote the development of smaller cities as preferred destinations for post-retirement living should offer support for healthcare and aged care, home ownership and access to other supporting services.

The provision of high quality healthcare and aged care facilities in smaller cities will be essential to their ability to attract older residents. Regional towns experience particular issues and challenges due to their smaller size and relative geographic isolation. Health outcomes in these areas have typically lagged those in larger metropolitan centres. The National Strategic Framework for Rural and Remote Health (AHMAC 2012) identifies a number of policy areas that could be targeted by local, state and national governments to offer better healthcare and aged care facilities in smaller cities. These include funding support and incentives for the provision of healthcare and aged care services in regional towns; development of technology, infrastructure and service models that are tailored to the needs of regional towns; and improvements in the recruitment, retention and distribution of rural and remote healthcare and aged care service providers.

Limited options for home ownership and rental in regional towns are frequently cited as a barrier to population growth (such as McKenzie and Rowley 2013). The COVID-19 pandemic has exacerbated the issue further, increasing demand for housing in regional cities, and causing housing prices to rise disproportionately more in these areas (Coulter 2021). Some have argued for an expansion in the role of the national government in the supply of affordable housing in regional markets (Rääbus 2021). However, related government initiatives in the past, such as the National Affordable Housing Agreement and National Rental Affordability Scheme, have not had a significant positive impact on regional housing markets (Beer et al. 2011). Consequently, careful consideration needs to be given to the design of new policies to ensure that they can deliver housing in locations where people want to live, and at prices that they can afford.

Finally, regional cities usually have lower population densities and greater distances between places, making services less accessible. Regional cities also have limited public transport services, making access even worse for those that cannot drive. The most commonly reported problems facing older Australians are a need for assistance with mobility and transport (Whelan et al. 2006), and driving cessation is routinely cited as a cause for greater depression and lower quality of life (Musselwhite and Shergold 2013). Increased and sustained funding for community transport schemes and expansion of demand responsive transport services are deemed vital to providing a viable alternative to private car ownership and use in regional centres (Mulley and Nelson 2012). These can, in turn, help expand access to services for disadvantaged and vulnerable populations.

Appendix A: Latent class choice models

Discrete choice models based on the theory of random utility maximisation have emerged as the predominant econometric framework for modelling individual choices (such as Train 2009). Among the large family of random utility maximisation-based discrete choice models, LCCMs have proven a popular framework to capture heterogeneity in preferences and discover behavioural variations among the population. They were first developed in the field of marketing sciences as tools to identify relatively homogenous consumer segments that differ substantially from each other in terms of their behaviour in the marketplace (Kamakura and Russell 1989). They have since gained widespread application in other disciplines, such as housing (such as Walker and Li 2007), energy (such as Shen and Saijo 2009) and transportation (e.g. Vij, Carrel et al. 2013; Ardeshiri and Rashidi 2020). In our case, LCCMs allow us to identify segments in the sample population that differ in terms of their preferences for settlement in urban and regional centres.

LCCMs comprise two components: a class membership model and a class-specific choice model. The class membership model formulates the probability that an individual belongs to a particular segment, or class, as some function of the characteristics of the decision-maker. Conditioned on the class that the decision-maker belongs to, the class-specific choice model formulates the probability that the decision-maker chooses a particular alternative as some function of the attributes of all of the alternatives in the choice set.

We begin with a description of the class membership model, formulated in our case as the familiar multinomial logit function:

$$P(q_{ns} = 1) = \frac{exp(\boldsymbol{z}_n' \boldsymbol{\gamma}_s)}{\sum_{s'=1}^{S} exp(\boldsymbol{z}_n' \boldsymbol{\gamma}_{s'})} \quad (4)$$

- q_{ns} equals one if individual n belongs to class s, and zero otherwise;
- z_n is a vector of individual-specific demographic and attitudinal characteristics, such as age, household structure and perceptions of different urban areas;
- γ_s is a vector of class-specific parameters denoting sensitivity to the individual-specific characteristics; and
- S is the total number of classes.

Note that the appropriate number of classes is determined exogenously, by comparing predictive performance and behavioural interpretability across models with differing numbers of classes.

Next, we describe the class-specific choice model. Note that each survey respondent is presented eight SP scenarios, where they are offered a choice between living in two different urban areas, and asked to indicate their preference. The dependent variable of interest is the preferred choice, denoted y_{ntj}, which equals one if respondent n over scenario t chose alternative j, and zero otherwise. For a given respondent n and scenario t, the class-specific choice model predicts the probability that urban area j is preferred.

Let $u_{ntj|s}$ be the utility of urban area j for scenario t and respondent n, conditional on the respondent belonging to class s, specified as follows:

$$u_{ntj|s} = \boldsymbol{x}'_{\boldsymbol{ntj}}\boldsymbol{\beta_s} + \varepsilon_{ntj|s} \quad (5)$$

- x_{ntj} is a vector of attributes specific to urban area j, such as climate, population size and average incomes;
- β_s is the vector of class-specific parameters denoting sensitivities to these attributes; and
- $\varepsilon_{ntj|s}$ is the stochastic component of the utility specification, assumed for the sake of mathematical convenience to be i.i.d. Gumbel with location zero and scale one across urban areas, scenarios and respondents.

Assuming the decision-makers are utility-maximisers, the class-specific probability that urban area j is preferred is given by the logit expression:

$$P(y_{ntj} = 1|q_{ns} = 1) = P(u_{ntj|s} \geq u_{ntj'|s} \forall j' = 1, \dots, J) = \frac{exp(\boldsymbol{x}'_{\boldsymbol{ntj}}\boldsymbol{\beta_s})}{\sum_{j'=1}^{J} exp\left(\boldsymbol{x}'_{\boldsymbol{ntj'}}\boldsymbol{\beta_s}\right)} \quad (6)$$

In this instance y_{ntj}, is the dependent variable of interest as defined previously; and J is the number of alternatives shown to the respondent for any scenario, equal to two in our case. The reader should note that heterogeneity in the decision-making process is captured by allowing the taste parameters β_s to vary across classes.

Equation six may be combined iteratively over alternatives and scenarios to yield the following class-specific probability of observing the vectors of choices y_n:

$$P(\boldsymbol{y_n}|q_{ns} = 1) = \prod_{t=1}^{T}\prod_{j=1}^{J}[P(y_{ntj} = 1|q_{ns} = 1)]^{y_{ntj}} \quad (7)$$

At this stage, $y_n = \langle y_{n11}, \dots, y_{nTJ} \rangle$; and is T the number of scenarios shown to a single respondent, equal to eight in our case.

Equations four and seven may be combined and marginalized over classes, to yield the unconditional probability of observing the vectors of choices y_n, which in turn may be combined iteratively over decision-makers to yield the following likelihood function for the data:

$$L(\boldsymbol{\beta}, \boldsymbol{\gamma}|\boldsymbol{y}, \boldsymbol{w}, \boldsymbol{x}, \boldsymbol{z}) = \prod_{n=1}^{N}\sum_{s=1}^{S}[P(\boldsymbol{y_n}|q_{ns} = 1)P(q_{ns} = 1)] \quad (8)$$

The unknown model parameters β and γ may be estimated by maximizing the likelihood function. All models for this study were estimated using the software package PandasBiogeme (Bierlaire 2020).

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