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Inquiry into population, migration and agglomeration

From the AHURI Inquiry: Inquiry into population growth, migration and agglomeration

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Related reports and documents

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Gurran, N., Forsyth, A., Darcy, M., Searle, G., Buckle, C. and Zou, S. (2021) *Population growth, regional connectivity, and city planning—international lessons for Australian practice,* AHURI Final Report No. 362, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/362, doi: 10.18408/ahuri7322301.

James, A., Rowley, S., Davies, A., Ong ViforJ, R. and Singh, R. (2021) *Population growth and mobility in Australia: implications for housing and urban development policies,* AHURI Final Report No. 365, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/365, doi: 10.18408/ahuri8122101.

Nygaard, C., Parkinson, S. and Reynolds, M. (2021) *Agglomeration effects and housing market dynamics,* AHURI Final Report No. 366, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/366, doi: 10.18408/ahuri5122401.

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The Inquiry Panel is to provide guidance on ways to maximise the policy relevance of the research and draw together the research findings to address the key policy implications of the research. Panel members for this Inquiry:

- Emma Flockhart, Department of Social Services
- Sidesh Naikar, Department of Social Services
- Katharine Hole, Infrastructure Australia
- Oliver Richards, Infrastructure Australia
- Simon Hunter, NSW Department of Planning, Infrastructure & Environment
- John Brockhoff, Planning Institute of Australia
- Michael Buchan, SA Housing Authority
- Joe Noon, SA Housing Authority
- Llewellyn Reynders, VIC Department of Infrastructure

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Acronyms and abbreviations used in this report

ABS	Australian Bureau of Statistics
AGDPMC	Australian Government Department of the Prime Minister and Cabinet
AHURI	Australian Housing and Urban Research Institute Limited
CBD	central business district
COVID-19	Coronavirus Disease 2019
ESPON	European Spatial Planning Observatory Network
ESDP	European Spatial Development Programme
EU	European Union
FIFO	fly-in fly-out
GDP	gross domestic product
HILDA	Household Income and Labour Dynamics Australia survey
IP	Inquiry Panel
LGA	local government areas
NHFIC	National Housing Finance and Investment Corporation
NOM	net overseas migration
NSW	New South Wales
NSWDPIE	NSW Department of Planning Industry and Environment
SA	Statistical Area
SCITC	Standing Committee on Infrastructure, Transport and Cities
SEIFA	Socio-Economic Indexes for Areas
SRP	supporting research project
SUA	Significant Urban Area
UK	United Kingdom
US	United States

Executive summary

Key points

- Area and individual-level unemployment are important determinants of people moving home. Housing considerations are also a major driver of both labour mobility and location-choice decisions that households make, and it is clear that housing tenure plays a particularly strong mediating role in such decisions. In addition, there are important interactions between urban amenities, the relocation decisions of more productive workers, and economic outcomes.

- There are strong lifestyle and life-cycle effects that help explain why people move—particularly to regional cities and areas—and the COVID-19 pandemic has accelerated this trend.

- Agglomeration increases productivity at the city scale for US cities, but the evidence is weaker for European and Australian cities. Below the metropolitan scale, there is stronger evidence that benefits also apply to Australian cities.

- Density is also important, but the effects are stronger at the larger of the sub-metropolitan spatial scale examined. This suggests that agglomeration effects operate most strongly below the metropolitan scale, but above the neighbourhood level.

- Agglomeration benefits in the form of higher wages apply to Australian cities, and are not fully offset by higher housing costs—but the benefits apply disproportionately to higher-income groups. Agglomeration economies may therefore play an important role in widening inequalities.

- Productivity gains begin to arise at relatively small city scale (100,000 population) and become stronger with city size and density. Policy should emphasise investment in major infrastructure for regional areas and cities, and satellite cities, which have already been identified as locations of population and economic growth.

- A number of unique international approaches to planning for growth could be adapted to the Australian context. However, regional and satellite cities perform best when integrated in highly connected networks, which emphasises the need for increased support for transport connectivity between major and regional / satellite cities.

- There is a clear connection between economic diversification and further economic growth—particularly economic development aligned to knowledge-industry activities. These opportunities are not heavily location-dependent. We encourage targeted support designed to capitalise on these growth opportunities.

- There is strong potential for strategies that seek to support economic and population growth in 'second order' Australian cities by focussing on particular local or regional strengths.

- There are interactions between the provision of infrastructure and household-move decisions—particularly in relation to the perceived importance of lifestyle factors influencing move decisions. However, infrastructure investment is lumpy, and needs to take place before promoting locations for population growth.

- Policies designed to promote city scale, density and inter-city connectivity must be balanced by policy options that expand affordable rental supply in Australia's inner urban areas, and the development of diverse and affordable rental housing in regional areas in order to support mobility of lower-income workers.

Research questions and key findings

This Inquiry examined theoretical, international and Australian case-study evidence and econometric modelling results designed to investigate the likely optimal size of Australian cities, and the scale at which productivity benefits are likely to arise.

The concept of 'agglomeration economies' is central to the research questions posed by the Inquiry. Agglomeration economies may arise for a range of different reasons, and we explore the arguments in greater detail later in the report. At a simple level, they can be understood as the combination of cost savings, efficiencies and increased market potential that benefit firms when they locate in more heavily populated cities, higher-density cities or cities with a greater diversity of firms, economic sectors and individuals (workers). Agglomeration economies are also applicable at regional level, and may vary widely in scope and importance between economic sectors.

Four Inquiry-level research questions were examined:

1. What are the key drivers of population growth and mobility in Australia, and what do the identified effects imply for housing and urban development policies seeking to facilitate and respond to population change?
2. At what population and geographic scales do agglomeration economies begin to alter the economic productivity of cities, and at what stage do these advantages begin to slacken off or give rise to diseconomies?
3. How are Australian urban and regional governance frameworks planning for and responding to economic and population growth, and what can be learned from international experience?
4. How can the benefits of agglomeration economies be quantified in the Australian context? This includes evaluation of housing market effects, employment density, market potential, traffic congestion / commuting times / pollution and wellbeing, and differences between household types or socio-economic groups.

The Inquiry found that agglomeration economies occur through three principal processes:

- labour pooling
- shared-input markets
- technological spillovers.

In theory, these processes improve the matching between employment opportunities and workers' skills, lower production costs and increase productivity through accelerating knowledge exchange. As cities become larger or denser, these processes should increase productivity.

The econometric evidence shows that agglomeration increases productivity at the city scale for US cities, but the evidence is weaker for European and Australian cities. When moving below the metropolitan scale, there is stronger evidence that benefits also apply to Australian cities. The evidence suggests that benefits begin at a fairly small scale (above 100,000 population) and increase disproportionately thereafter. There is no evidence of diseconomies arising from scale.

The evidence is that density is also important, but the effects are stronger at the larger of the sub-metropolitan spatial scale examined. This suggests that agglomeration effects operate most strongly below the metropolitan scale, but above the neighbourhood level. However, after controlling for firm and individual-level characteristics, the estimates of agglomeration advantages are much lower than in earlier reported studies.

This suggests strong potential for strategies that seek to support economic and population growth in 'second order' Australian cities by focussing on particular local or regional strengths.

Housing considerations are a major driver of both labour mobility and location-choice decisions that households make, and it is clear that housing tenure plays a particularly strong mediating role in such decisions. This may reflect the inherent insecurity of private renters, the role of high transaction costs for owners, or some combination of these factors. Importantly, high transaction costs contribute to a lack of labour-market mobility on the part of Australian workforce, with knock-on consequences for the efficient functioning of labour markets.

There is an appetite for movement between metropolitan and regional areas, and within regional areas, suggesting that policies enabling mobility will benefit regional housing and labour markets. Household moves are triggered by more than dwelling and locational preferences, but reflect employment, health, education, recreational and lifestyle-related services.

The evidence suggests that unemployment is an important determinant of people moving home—both individual unemployment and the area level of unemployment. Australians are more likely to move long distance from regional to metropolitan areas as a result of a need to be closer to their place of employment or study. Metropolitan-to-regional moves also occur, but are more likely to be prompted by lifestyle considerations.

A review of international approaches to planning for economic growth reveals a number of unique approaches that could be adapted to the Australian context. These include:

- polycentric development of satellite cities linked to major metropolitan centres
- regional development of a network of decentralised centres linked to technology clusters
- identification of designated growth centres within an economic diversification strategy.

Overall, the Inquiry findings suggest that it is important to ensure that local housing supply can respond quickly to shifts in population demand. This requires both state and local governments to implement land-release and infrastructure strategies that can quickly respond to demand shifts. In the case of metropolitan areas, housing supply needs to be responsive enough to meet the housing needs of workers and jobseekers in job-rich areas.

However, it is also important to reflect on the premise that, even if agglomeration economies deliver higher productivity and hence higher wages, this does not mean that public policy decisions should necessarily seek to move people or jobs from one place to another.

There is no prior theoretical reason (or empirical evidence) to support the idea that gains from agglomeration fully offset (or more than offset) economic losses made elsewhere when economic activity is moved through intervention.

The evidence from this Inquiry also suggests that, while agglomeration benefits in the form of higher wages apply to Australian cities—and are not fully offset by higher housing costs—the benefits apply disproportionately to higher-income groups. Yet, the impact on housing costs is likely experienced across the entire income distribution. This suggests that agglomeration economies may play an important role in widening inequalities.

We found that there are probably important interactions between urban amenities (widely defined), the relocation decisions of more productive workers, and economic outcomes. In other words, business start-ups, entrepreneurial activity and the migration of higher productivity workers are likely to be endogenous processes.

In addition, there are strong lifestyle and life-cycle effects that help explain why people move—particularly to regional cities and areas—and the COVID-19 pandemic is seen to have accelerated this trend.

There are interactions between the provision of infrastructure, and household-move decisions, particularly in relation to the perceived importance of lifestyle factors influencing move decisions. However, infrastructure investment is lumpy and needs to take place before promoting locations for population growth.

Analysis of successful regional, satellite and growth-centre cities suggests that there are some common characteristics. These include:

- historic connections to primary industries
- recent restructuring of economies
- diversification into health and social care, retail and education.

Economic development initiatives targeting technology sectors, and the influence of university campus operations, are also important factors.

Population projections and transportation planning and infrastructure play an important role in forming funding and planning trajectories, but unambitious approaches are seen to undermine the potential for growth in regional and satellite centres.

Policy development options

We propose four principal policy development opportunities, reflecting on the results of this Inquiry.

First, we note both that productivity gains appear to arise at relatively small city scale (100,000 population) and become stronger with city size and density. We suggest the policy should emphasise investment in major infrastructure for regional areas and cities and satellite cities that have already been identified as locations of population and economic growth.

Second, reflecting that regional and satellite cities perform best when integrated in highly connected networks, we encourage increased support for transport connectivity between major and regional / satellite cities—but we also emphasise that these policies must be offset by other policies designed to maintain or improve housing affordability.

Third, there is a clear connection between economic diversification and further economic growth—particularly economic development aligned to knowledge-industry activities. These opportunities are not heavily location-dependent. We encourage targeted support designed to capitalise on these growth opportunities.

Fourth, we note from the research evidence and the expert advice from our Inquiry Panel members that it is generally much easier from a policy perspective to move people than to move jobs. We also note the strong role that tenure and housing affordability play in both facilitating and impeding labour-market mobility in Australia. We therefore advise policy options that expand affordable rental supply in Australia's inner urban areas, and the development of diverse and affordable rental housing in regional areas in order to support mobility of lower-income workers.

We also note that an Inquiry of the scale reported in this Final Report, together with its complexity, inevitably throws up additional unanswered questions that may call for future research activities. In the case of this Inquiry, the research method was designed and much of the work undertaken prior to and during the COVID-19 pandemic. This complicates the interpretation of the results and increases the need for further research activities. The research summarised in this report suggests that there are many alternative options for planning for population change and migration in Australia.

There are several remaining and new research questions:

- What are the net overseas migration (NOM) scenarios beyond 2021? When, realistically, will significant flows of migrants return to Australia, and what are the implications for economic development and planning?
- What are the longer-term implications of large-scale flows of returning Australians on labour markets, housing markets and costs, and on the economy? And to what extent do the socio-economic, demographic and household wealth characteristics of such households matter in terms of impacts to the Australian housing system?

- Are the regional housing market trends, and trends of decentralisation within cities, temporary phenomena triggered by the pandemic, or are they likely to persist for longer? What are the implications for housing markets and costs, and for job creation?
- How will patterns of commuting, interstate migration, labour mobility and teleworking change after the pandemic ends? Are there particular implications for regional and outer-urban suburban housing markets? Will patterns revert to previous patterns, or will they exhibit a permanent change?
- To what extent does the provision of infrastructure, including digital connectivity, facilitate effective spatial movement of jobs in addition to—or rather than—people?

The study

This Inquiry Final Report provides a synthesis of research findings from a suite of interrelated research activities conducted during AHURI's Inquiry into Population, Migration and Agglomeration. We found that NOM is associated with positive impacts on economic productivity.

However, labour productivity is complex, and is driven by a range of different factors. Recent debate has emphasised the potential role of agglomeration economies, which in turn suggests that the spatial organisation of labour and housing markets is key to Australia's future prosperity. Agglomeration economies matter in terms of the determination of economic productivity, and the attractiveness of places to workers and migrants.

Agglomeration economies include:

- labour pooling
- shared-input markets
- technological spillovers.

Other reasons put forward in the literature for the existence of positive agglomeration economies include the following:

- Positive (non-zero) transportation costs mean that denser areas offer an advantage or reduce relative transport costs.
- Very dense areas of economic activity offer opportunities for a higher degree of specialisation (or division of labour).

The role of housing outcomes and their influence on productivity has until now been lightly studied—particularly adverse housing-system outcomes such as lack of affordable housing opportunities, low diversity of housing choices, and long commute times. However, there are some exceptions. For example, Gurran, Phibbs et al. (2015) summarise the four main impacts of housing as:

- labour-market mobility
- labour-market participation and employment
- urban congestion
- indirect costs—such as the pressure that high housing costs exerts on wage demands.

Gurran, Phibbs et al. (2015) also note growing disparity between housing markets that offer accessibility to capital city employment markets, and outer metropolitan and regional areas. Whelan and Parkinson (2017) find that unemployed people, underemployed people and private renters have higher mobility and lower reservation wages than home owners and employed people. Van den Nouwelant, Crommelin et al. (2016) note escalating commuting times and a growing mismatch between low-income employment and low-income housing opportunities, with a knock-on impact to economic productivity (see also Maclennan, Randolph et al. 2019). Gurran, Forsyth et al. (2021) find that lower-income renters, who make up a critical sector of the urban workforce, experience high rates of housing stress, endure long commutes, or have lower rates of labour-market engagement, reflecting a shortage of affordable accommodation in employment centres.

Further population growth and continued importing of human capital from abroad may be a source of additional agglomeration benefits and productivity gains. However, population growth also requires infrastructure investment and responsive housing development to avoid developmental bottlenecks, inequality and reduced community wellbeing. This has raised debate about the economic and social benefits and costs of alternative urban transition and population distribution strategies.

The Inquiry was structured to include a range of quantitative and qualitative research methods, largely embedded within four supporting research projects (SRPs). James, Rowley et al. (2021) carried out analysis of census data, housing aspirations survey data and key-actor interviews. Nygaard, Parkinson et al. (2021) and Leishman, Bond-Smith et al. (2021) are heavily based on statistical information—particularly on econometric analysis of secondary data. Meanwhile, Gurran, Forsyth et al. (2021) is based on a combination of international case-study evidence, Australian key-actor interviews and Australian case studies.

1. Background to the Inquiry

- **This Inquiry into population, migration and agglomeration was designed and commissioned before the COVID-19 pandemic and, as such, the research design, methods and findings have been heavily impacted.**
- **Despite this, population and migration policy remain critical to Australia's economic sustainability and future. Thus the findings remain of keen relevance to Australia's future, particularly in light of the policy choices that will arise as the world begins to plan beyond the pandemic.**
- **Agglomeration economies are fundamentally about economics, and the scope of this Inquiry considers the international and Australian evidence about the existence and scale of such effects.**
- **However, the implications extend well beyond economic theory, and concern Australia's options for planning for population change and settlement for decades to come.**

1.1 Policy context

Net overseas migration (NOM) is a key driver of population growth and labour supply growth, with labour supply growth playing a significant role in overall economic expansion (growth in GDP) in Australia. NOM is associated with positive impacts on economic productivity. These impacts are associated with increasing scale and density, and also because international migrants tend to be young (of working age or students) and because younger and more highly educated or skilled temporary and permanent migrants make a net fiscal contribution (Dustmann and Frattini 2014).

Of course, labour productivity is complex, and is driven by a range of different factors. Recent debate has emphasised the potential role of agglomeration economies, which in turn suggests that the spatial organisation of labour and housing markets is key to Australia's future prosperity. There is mounting empirical evidence to show not only that agglomeration economies exist, but that they matter in terms of the determination of economic productivity. Glaeser and Gottlieb (2009) point out that human capital spillovers suggest that attracting workers to an area will boost local productivity. It has also been shown that low-income workers and households with benefit recipients tend to gravitate towards areas with stronger employment opportunities (Glaeser and Gottlieb 2009).

Agglomeration economies include three distinct categories put forward by Marshall (1890/1920):

- labour pooling
- shared-input markets
- technological spillovers.

Other reasons put forward in the literature for the existence of positive agglomeration economies are that:

- positive (non-zero) transportation costs mean that denser areas offer an advantage or reduce relative transport costs
- very dense areas of economic activity offer opportunities for a higher degree of specialisation (division of labour).

In terms of the policy implications, some commentators (for example Chatterji, Glaeser et al. 2013) argue that some policies have many positive aspects, and few negative aspects. They include allowing more skilled immigration, strengthening education systems and eliminating unwise regulations in this category of policy intervention. They argue that there is not enough evidence to show that policies designed to cluster entrepreneurship are effective.

However, the role of housing outcomes have until now been lightly studied—particularly adverse housing-system outcomes such as lack of affordable housing opportunities, low diversity of housing choices, long commute times and their influence on productivity.

There are some exceptions. For example, Gurran, Phibbs et al. (2015) summarise the four main impacts of housing as:

- labour-market mobility
- labour-market participation and employment
- urban congestion
- indirect costs—such as the pressure that high housing costs exerts on wage demands.

Gurran, Phibbs et al. (2015) also note growing disparity between housing markets that offer accessibility to capital city employment markets, and outer metropolitan and regional areas. Whelan and Parkinson (2017) find that unemployed people, underemployed people and private renters have higher mobility and lower reservation wages than home owners and employed people. Van den Nouwelant, Crommelin et al. (2016) note escalating commuting times and a growing mismatch between low-income employment and low-income housing opportunities, with a knock-on impact to economic productivity (see also Maclennan, Randolph et al. 2019). Gurran, Forsyth et al. (2021) find that lower-income renters, who make up a critical sector of the urban workforce, experience high rates of housing stress, endure long commutes, or have lower rates of labour-market engagement, reflecting a shortage of affordable accommodation in employment centres.

Agglomeration economies are fundamentally about the effects of proximity on productivity. Prior to the COVID-19 pandemic, the concept of agglomeration economies was becoming more important to Australian public policy debate for a number of reasons, including the apparent slowing down of economic growth and productivity in Australia's largest capital cities. There are also growing concerns over levels of poverty and inequality.

Meanwhile, Australia's labour productivity, while marginally improved since the global financial crisis (GFC; Campbell and Withers 2017), is nevertheless below the rate required to maintain Australia's historic per capita income growth rate of 2.5 per cent and is driven by capital deepening—that is, more capital per worker—rather than multifactor productivity (Campbell and Withers 2017).

This Inquiry was designed and commissioned before the COVID-19 pandemic, when a key policy question being faced by the Australian Government concerned the 'future of work' and technological change, including digital connectivity and automation (Infrastructure Australia 2018; Australian Government Department of the Prime Minister and Cabinet [AGDPMC] 2019).

The significance of these questions has increased further in the light of rapidly evolving working practices and reliance on digital technologies during the many periods of lockdown, which have been quite drawn out in some jurisdictions. A critical question in urban, housing and smart cities governance is how to shape the 'work–residence' relationship and commutes in the context of the increasing significance of the digital economy (Belzunegui-Eraso and Erro-Garcés 2020).

Further population growth and continued importing of human capital from abroad may be a source of additional agglomeration benefits and productivity gains. However, population growth also requires infrastructure investment and responsive housing development to avoid developmental bottlenecks, inequality and reduced community wellbeing. This has raised debate about the economic and social benefits and costs of alternative urban transition and population distribution strategies. Infrastructure Australia (2018: 2) raised a series of questions concerning population growth and urban transitions. The impact of 'megatrends' (Balliester and Elsheikhi 2018), as well as the profound disruption generated by COVID-19, will also significantly shape the policy challenge.

Productivity increases in cities and regions will have differing impacts on incomes, jobs and housing prices because of the variations in housing supply elasticity between locations. Elasticity, in turn, depends on the availability of land and the extent to which planning controls permit housing development. While planning and infrastructure responses attempt to accommodate further population growth in Australia's dominant cities, it is logical to question whether an alternative population and urban growth strategy could result in superior outcomes in terms of economic growth and wellbeing. This argument is driven by the notion that regional areas and satellite cities could begin to harness the advantages of agglomeration economies if permitted or encouraged to grow around place-based specialisations. Strategies to retain and attract populations in regional centres and satellite cities could have an economic productivity dividend and lower negative impacts (or diseconomies) such as congestion, noise, overcrowding, housing stress and pollution.

The Australian Government's 2019 framework *Planning for Australia's future population* recognises the productivity-enhancing benefits of employment concentration (AGDPMC 2019). As such, it makes provision for federal-level investment to address infrastructure and housing bottlenecks in cities that will allow cities to continue to harness the benefits of agglomeration. In this perspective, infrastructure investment becomes a means of reconfiguring the spatial relationships between housing and employment (Pill, Gurran et al. 2020). However, *Planning for Australia's future population* also sets out a 'decentralisation agenda' as a means of relieving pressure on capital cities (AGDPMC 2019).

Provision of infrastructure to support population growth is a multi-level exercise that relies on a high degree of coordination across government levels and infrastructure agencies (Pill, Gurran et al. 2020). In Australia, City Deals have emerged as a vehicle for supporting connectivity in cities, as well as multi-level coordination and collaboration around land-use planning and governance (Pill, Gurran et al. 2020). City Deals sit within a suite of place-based metropolitan economic strategies that aim to enhance the productive capacity of cities by reducing persistent inefficiencies—for example, by operating across governance levels to enable transport infrastructure that better coordinates the flow of workers between home and work. Here too, an important question will be how such a strategy can (or will) affect the economy's ability to absorb a larger population and meet challenges associated with climate change and an ageing population.

Regarding policies designed to subsidise the movement of firms or people, Glaeser and Gottlieb (2009: 1014) caution that the simple existence of agglomeration economies does not necessarily imply that policy intervention should facilitate this, or what form those interventions should take. They also note that 'the existence of agglomeration economies does not imply that the winning area will win more than losing areas loses'.

In the next section, we note that the empirical evidence supporting the existence of agglomeration economies and associated economic productivity benefits is based heavily on North American experience and data. One of the objectives of this Inquiry was to address the fact that there is relatively little existing empirical evidence to suggest that agglomeration economies are as important to Australian cities, or to demonstrate the scale of the effects. Despite the policy interest and debate, there is very little robust evidence to suggest how large cities (and potentially their hinterlands) must be before meaningful agglomeration benefits arise.

1.2 Existing research

There has been a longstanding recognition by economists and economic geographers of the complexity and significance of agglomeration effects on the productivity and competitiveness of cities (Marshall 1890/1920). The possible existence of agglomeration economies has been offered as an explanation for the higher productivity performance of larger cities. Models have been used to explain why:

- economic activities have increasingly clustered or localised in larger metropolitan areas at the same time as global flows of goods, labour and finance have increased
- incomes and employment rates do not completely converge across cities and regions in national economic systems
- some cities have had protracted performance as what has been labelled—arguably incorrectly—as superstar cities (Glaeser and Gyourko 2018).

As Leishman, Bond-Smith et al. (2021) note in their Final Report on a supporting research project (SRP) in this Inquiry, the empirical evidence that already exists in relation to agglomeration economies is largely confined to the US experience and, to a lesser extent, European cities. It is also important to note that there are very significant differences in productivity between countries—as well as between cities within countries. The evidence from US research shows that higher employment density increases labour productivity and rates of entrepreneurship, and that urbanisation economies are generally positive and found to be significant in numerous studies (see Brülhart and Mathys 2008; Carlino, Chatterjee et al. 2007; Ciccone and Hall 1996; Wheeler 2001).

Based on Canadian data, Baldwin, Beckstead et al. (2007) find buyer-supplier networks, labour-market pooling and knowledge spillovers are all significant determinants of productivity, but that the effects are not uniform between industry types. Rosenthal and Strange (2003; 2008) find that localisation economies—which are agglomeration economies arising from spatial concentration within a given industry—accumulate much more rapidly in the 'first few miles', and then slowly after that.

Foster and Stehrer (2009) examine 255 regions in 26 European countries, including Central and East European countries, and find a substantial difference in the scale of agglomeration economies between 'new' and 'old' Europe, attributing this to the more uneven nature of transport and business infrastructure in new than in old Europe. Combes and Gobillon (2014) note that highly skilled workers generate local externalities, and that they are over-represented in cities because they value these amenities.

A number of AHURI reports have focussed on the potential productivity-enhancing benefits for housing and affordable housing supply (Dodson, de Silva et al. 2017; Gurran, Phibbs et al. 2015; Maclennan, Ong et al. 2015; van den Nouwelant, Crommelin et al. 2016).

Maclennan, Ong et al. (2015: 1) conclude that there is little evidence on the long-run growth and productivity impact of housing. More recently it has been argued that there are linkages between unaffordable housing markets and lower economic productivity because unaffordable housing pushes lower-income workers to the urban periphery and diverts consumption towards payment of rent and travelling costs (Maclennan, Randolph et al. 2019). Housing affordability can therefore be seen as instrumental to productivity by enabling employment participation and better matching of skills to available jobs (Coulson and Fisher 2009; Ferreira, Gyourko et al. 2010; Oswald 1996; van den Nouwelant, Crommelin et al. 2016; Whelan and Parkinson 2017). A mismatch between the geography of affordable housing and employment concentrations is therefore sometimes seen as detrimental to economic development (Gurran, Forsyth et al. 2021; Standing Committee on Infrastructure, Transport and Cities [SCITC] 2018).

Recently—and particularly following the GFC—there has been a growing concern that larger cities that had led national productivity growth are now reverting to average national performance. For instance, there have been claims in Sydney and Melbourne that creative cultural clusters and other skilled households and firms are being diverted by high costs and congestion in major metropolitan cores to smaller, lower-cost locations. Maclennan, Ong et al. (2015) cite published evidence of such effects in North America and note that lower-cost new locations

do not always best serve long-term innovation and productivity growth for the nation. The New Zealand Government has recently been concerned that productivity in Auckland—which led the NZ economy through the 1990s—has now fallen below the national average.

A number of recent reports on commuting patterns within metropolitan areas, migration patterns from metropolitan areas to smaller cities and towns (Australian Bureau of Statistics [ABS] 2019; ONS 2019; Statistics Canada 2019), and the productivity effects of metropolitan housing shortages (Hsieh and Moretti 2019) have all suggested a worrying possibility that housing-system outcomes are driving suboptimal productivity outcomes.

1.3 Research methods

At its core, economics is concerned with maximising the wellbeing of individuals and households that make up society, and this goal is realised by striving to attain the highest possible level of economic outputs with respect to inputs. The ratio of economic output to inputs—which comprise land and capital and, above all, labour—is a measure of economic productivity. The higher the level of economic productivity, the higher the production of goods and services, hence economic wellbeing, for a given level of domestic resources.

The goal of raising economic productivity is rising in importance nationally and internationally. In part, this is because the populations of most countries in the Global North—that is, developed countries—are ageing as a result of higher life expectancy and other demographic processes. But this is not the only reason: economic productivity is elusive and, to an extent, is harmed by success.

As a country grows wealthier and the standard of living rises, so the imperatives that underpin economic productivity grow weaker. In the case of housing, it has been conjectured that the rate of unemployment is positively correlated with the rate of home ownership (Oswald 1996). This has caught the attention of housing and economic policy researchers internationally. If this is true, it now matters deeply in an Australia context because Horne's (1964) 'lucky country' achieved its past successes through the abundance of opportunity—including high quality, low-cost housing opportunities—rather than, Horne argues, through policy design.

In recent years there has been considerable research and policy attention focussed on the issues of declining economic productivity and population ageing, and the linked question of migration. In short, maintaining a high standard of living for Australians as the population ages, the costs of caring for people rises, and the effective (labour) tax base falls, can only be realised if there are significant advances in economic productivity. The ABS (2013) estimates that the proportion of working-age people in Australia will decline by 7 or 8 percentage points.

Commonly cited barriers to the improvement of economic productivity in Australia include:

- high housing costs—which reduce the opportunities to match productive workers to affordable housing opportunities
- diseconomies associated with urban agglomeration—the big cities have become too big (Hulse, Reynolds et al. 2015; Maclennan, Ong et al. 2015; van den Nouwelant, Crommelin et al. 2016).

Migration is a hotly contested topic, particularly international migration, with many commentators arguing that migration drives up housing costs, which leads to housing unaffordability, with a feedback effect in terms of reducing economic productivity. Others point out that international migrants make a positive contribution to economic output and productivity. The balance of the affordability vs the productivity impact is unclear at present, with relatively little empirical evidence to inform us.

AHURI has funded a number of research projects examining linkages between housing and productivity, and the case that housing has a role to play has been well made (see for example Gurran, Phibbs et al. 2015). It is worth noting that agglomeration economies are inherently complex—not just to estimate statistically, but in terms of how they interact with city size, regional and spatial issues, change over time, and may be subject to threshold and non-linear effects. For example, as Fingleton (2008) argues, policies designed to promote the supply of affordable

housing may give rise to higher housing prices because supply attracts migrants who then add to market potential and cause an increase in productivity. Indeed, this argument demonstrates the 'wicked problem' nature of the issue, as policy makers are as concerned about housing affordability as economic productivity, and facilitating one without undermining the other is inherently difficult.

This Inquiry was motivated by the idea that harnessing 'agglomeration economies' may provide the basis for designing policy solutions that boost economic productivity without seriously harming housing-system outcomes.

The term 'agglomeration economies' refers to the net aggregate impact of the various internal and external economies or advantages vs disadvantages that accrue when firms locate in urban areas. This includes:

- economies of scale that arise when firms access larger markets
- internal advantages when firms can access higher-quality labour supply
- cost advantages associated with accessing established supply chains.

In terms of negatives, congestion, increased travel times, and the health and wellbeing impacts associated with large urban agglomerations must be taken into account (Beer et al. 2011; Maclennan, Ong et al. 2015).

Yet as Glaeser and Gottlieb (2009) point out, agglomeration economies are difficult to estimate, and may be subject to non-linear and threshold effects. The case for making policy interventions in an attempt to realise agglomeration economy dividends is far from having been made empirically.

This Inquiry interrogated the Australian and international evidence, asking what the full range of costs and benefits are in terms of agglomeration economies, and when these effects might begin to arise, and how they change in scale as cities grow, and depending on spatial context. It did this by setting four overarching research questions, addressed by the Inquiry activities and through a set of SRPs (although there were four SRPs, they were not designed to be mapped onto or answer the four Inquiry research questions on a 1:1 basis). The Inquiry-level research questions are as follows:

1. What are the key drivers of population growth and mobility in Australia, and what do the identified effects imply for housing and urban development policies seeking to facilitate and respond to population change?
2. At what population and geographic scales do agglomeration economies begin to alter the economic productivity of cities, and at what stage do these advantages begin to slacken off or give rise to diseconomies?
3. How are Australian urban and regional governance frameworks planning for and responding to economic and population growth, and what can be learned from international experience?
4. How can the benefits of agglomeration economies be quantified in the Australian context? This includes evaluation of housing market effects, employment density, market potential, traffic congestion / commuting times / pollution and wellbeing, and differences between household types and/or socio-economic groups.

The Inquiry examines evidence from Australia and internationally in order to generate a consensus on what kinds of spatial interventions work best in terms of maximising economic productivity and minimising the adverse effects of urbanisation and agglomeration. It considers how to optimise growth strategies for urban systems and asks which regions, cities and satellite cities might offer the best prospects for future focus on population growth and economic development. To accomplish this, the Inquiry-level research methods can be summarised as follows:

- Background literature and policy reviews leading to the development of Inquiry-level research questions.
- Development of SRP research questions designed to answer specific dimensions of the Inquiry questions (with methods designed within each SRP).
- Synthesis of SRP literature reviews and empirical findings, leading to production of Inquiry Panel discussion papers.
- Inquiry Panel discussions centred on specific policy questions arising from the discussion papers.
- Overall synthesis of all SRP and Inquiry Panel findings and outputs, leading to the production of this Inquiry Final Report.

As noted above, four SRPs pursued a range of more specific research questions with a view to generating the empirical evidence necessary to address the Inquiry-level questions. Within each SRP, a range of different research methods was adopted. For example, James, Rowley et al. (2021) used a sequential mixed-methods approach beginning with a profiling of Australia's most prominent population trends between 2006 and 2016. This analysis was facilitated by commissioning a special purpose dataset using ABS census data, and by mapping data to SA3 using a methodology provided by the ABS. Specifically, this involved taking series 2 population projections available at state level, applying these at SA3 level, and then generating differences between observed and projected populations. The project also mapped these outcomes using ARCGIS software, using SA3 shape files provided by the ABS.

A second strand of analysis drew on the Household, Income and Labour Dynamics in Australia (HILDA) survey to estimate a random effects logit model of the odds of an individual making a residential move across successive waves. The model accounted for personal, housing and area-level variables (predictors) to explain mobility decisions, and to allow an analysis of the relative importance of factors such as labour-market opportunities, housing affordability and life-cycle factors in driving such decisions.

A third strand of analysis was qualitative in nature. It involved the selection of local government areas (LGA) case studies chosen by examining a group of SA3 geographical areas identified in the first strand of analysis as areas that exhibited higher or lower levels of population change than observed at state level. Semi-structured interviews were then carried out with 25 key stakeholder in the 15 LGAs chosen as case studies, with interview questions driven principally by the findings of a strand of activity contained within another SRP in this Inquiry—as reported by Gurran, Forsyth et al. (2021). Specifically, Gurran, Forsyth et al. (2021) included a review of contemporary policy frameworks designed to learn lessons for population growth, regional connectivity and city planning policy. The qualitative data from the 15 LGA case studies were analysed thematically and reported by James, Rowley et al. (2021).

The SRP reported by Gurran, Forsyth et al. (2021) also employed a mixed-methods research approach, beginning with a review of international research evidence on metropolitan and regional approaches to governance and planning, including from Australia. This review included an examination of how planning and spatial policy can promote both economic and population growth, specifically leading to the identification of growth centres, satellite cities and regional renewal areas as promising spatial strategies. As noted earlier, outcomes from this strand explicitly informed the research methods reported in James, Rowley et al. (2021).

Following on from the review of Australian and international evidence, Gurran, Forsyth et al. (2021) then went on to more in-depth testing of the potential of these spatial models and approaches for promoting economic and population growth through a set of 14 exemplar Australian and international case studies. Regional renewal case studies included EU and UK cities, while regional growth-centre case studies included EU and Australian examples. Satellite-city case studies included examples from the EU, the UK, Canada and Australia —including, for example, Toowoomba (Queensland) and Geelong (Victoria). In general, international case studies were selected on the basis of potential relevance to the Australian context. Meanwhile, Australian case studies were chosen to ensure a range of sizes and economic / growth characteristics were represented, but the focus was on regions with a population of 80,000 or higher, while excluding Australia's major capital cities. Two coastal case studies—Mandurah (WA) and Northern Rivers (NSW)—were chosen to provide an opportunity to study economic development policy and challenges in the presence of regional migration driven by lifestyle factors.

Two SRPs with strong quantitative projects are reported in full by Leishman, Bond-Smith et al. (2021) and Nygaard, Parkinson et al. (2021). These can be seen as complementary, as they respectively offer perspectives on city scale on productivity, and on agglomeration effects principally within cities.

Leishman, Bond-Smith et al. (2021) include a review of the international literature on agglomeration economies and city scale, noting that the literature is currently underdeveloped in the Australian context. The project asked at what city scales agglomeration economies arise, noting that 'agglomeration economies' is a blanket term, taken to mean the combined efficiencies and benefits of many different types of effect arising from firms locating

in proximity to each other in an urban or regional context. For example, the project investigated how important, relative to each other, are accessibility, housing costs, real estate costs, population density, environmental factors, availability of skills and migration to economic development? In the econometric analysis, the focus was on income levels (as a proxy for productivity), but the analysis also examined growth in jobs, businesses and city-scale economic output. The main innovations pursued in this project were the analysis of relationships in three international contexts (US, EU and Australian cities), and the development of a threshold model designed to identify the population scale of cities at which evidence of agglomeration economies first appears. The analysis also examined whether agglomeration effects are linear, rising or falling, with respect to city scale. In general, the research found that agglomeration effects increase in magnitude with city scale.

Meanwhile, the SRP reported by Nygaard, Parkinson et al. (2021) has a distinctly micro-economic / economic approach, with a focus on employment density rather than city scale. The project recognised that—in principle at least—both higher wages and higher housing costs can be conceived as indicators of higher urban productivity. Firms offer higher wages to more productive workers, and in more productive places. However, higher wages can, in turn, become capitalised into higher housing prices. The project undertook a micro-econometric analysis of HILDA data to test whether places with higher employment densities implied a wage premium. It also examined whether such premiums persisted after controlling for housing costs. The modelling approach employed a 'Mincer single equation earnings function' utilising demographic, education, occupation, economic sector variables, employer characteristics and a range of control variables, including area variables capturing economic structure, diversity and specialisation.

1.4 The COVID-19 pandemic

As noted earlier, this Inquiry was conceived, designed and commissioned prior to the COVID-19 pandemic, but there can be no question that the pandemic impacted upon the research process, the findings and the development of policy options. The full implications are not necessarily clear or straightforward, and require explicit consideration when reading this report and its conclusions.

As noted in Section 2.3, Australia's population before the pandemic was heavily concentrated in urban areas —particularly in Australia's two largest metropolitan areas, Sydney and Melbourne. Only around 10 per cent of population resided in smaller settlements of approximately 10,000 or less, while just over 5 per cent resided in rural areas.

One important consequence of the pandemic was the apparent shift in households' preferences towards dwellings with additional internal space for home working or learning, for external space (balconies, terraces, gardens), and a shift in preferences towards outer suburbs and regional / rural areas (see Real Insurance, 2021, for recent survey evidence and Centre for Population, 2021, for analysis of trends in regional migration). It is important to emphasise that neither the scale of these shifts, nor questions about their permanent rather than transitory nature, had been the subject of rigorous, published research at the time of finalising this report. Indeed, this reflection applies to many, if not all, of the observed shifts in preferences and behaviour since the beginning of the pandemic.

In an AHURI-commissioned study of the impacts of income-support measures on housing-cost stress, Leishman, Bond-Smith et al. (2021) highlighted that the most immediate labour-market effects in the early stage of the pandemic in Australia were large-scale losses of jobs in economic sectors reliant on face-to-face business. In Australia, the first economic impacts were felt from January 2020 in the higher education sector, closely followed by tourism, as international borders were effectively closed well in advance of the World Health Organization pandemic designation on 11 March 2020. ABS statistics for the second quarter of 2020 showed that the pre-JobKeeper—Australia's main income-support measure—loss of jobs was particularly acute in the economic sectors of healthcare and social services, followed by accommodation, administration, then arts.

While the Australian economy recovered strongly in late 2020 and throughout much of 2021, at the time of finalising this report, most of New South Wales and Victoria were locked down again in the midst of outbreaks of the Delta variant of COVID-19, and economic and trade data were beginning to point in the direction of further weakness to economic growth prospects. Most internal borders within Australia were closed, and international borders were also still largely closed, subject to very limited weekly caps on international arrivals. As Leishman, Bond-Smith et al. (2021) outline, Australian economic growth had been heavily predicated on large-scale NOM flows prior to the pandemic. The Centre for Population (2020) predicted a 2031 population 1.4 million lower than pre-COVID under their 'extended restrictions' scenario. This combination of circumstances arguably strengthens the economic case for planning, settlement and population policies that seek a productivity dividend through harnessing agglomeration effects.

The working-from-home phenomenon is another potential game changer, and has been subject to a great deal of research interest during the pandemic. The Centre for Population (2021) reported that only 21.5 per cent of people reported working from home prior to the pandemic, rising to 40 per cent in September 2020. There is little doubt that the pandemic triggered something of a revolution in working from home, and associated working practices and technologies—but there are many different views about the permanence or transience of these developments. It also seems likely at the time of writing that views and sentiment depend partly on the extent of lockdowns, other social and work restrictions and vaccination rates, as they vary between international settings. However, it may be worth speculating about several possible scenarios in order to illustrate how future trends might impact on the findings of this research, and the policy development options flowing from it. We return to these issues later in the report, when outlining policy development options in Section 5.

2. Trends in population growth and mobility

- This section synthesises a range of complex reasons that underpin households' decisions to move home and location. Overall, there strong links between residential mobility and labour mobility in Australia.
- Population ageing, outward migration of younger cohorts, technological advance and economic restructuring are important determinants of areas having lower than expected population growth.
- Mobility is linked to the availability of services valued by households, including transport, health, education, policing, childcare and recreation.
- Recent grey literature emphasises significantly increased demand for relocating to regional towns and cities during the COVID-19 pandemic. These trends will have influenced our own qualitative research, but it is too early to say whether the trends are permanent or temporary.
- The Inquiry noted the lower than expected population growth outlook in Australia, principally caused by an enormous decrease in NOM (by 2031 the population will be smaller by 1.1 million people compared to pre-pandemic scenarios).
- Policies enabling mobility are likely to have potential to benefit regional housing and labour markets.
- It is important to ensure that local housing supply can respond quickly to shifts in mobility patterns and preferences so that opportunities can be delivered without productivity gains being offset through raised housing costs.

2.1 Introduction

This section addresses the first Inquiry research question:

> **What are the key drivers of population growth and mobility in Australia, and what do the identified effects imply for housing and urban development policies seeking to facilitate and respond to population change?**

In this section we begin by examining the literature on residential mobility in order to unpack the key drivers of these processes. We then carry out a rapid synthesis of the findings of one of the SRPs (James, Rowley et al. 2021) in terms of understanding the most pronounced or evident trends in spatial patterns of population growth in Australia 2006–2016—that is, prior to the COVID-19 pandemic. We briefly introduce some of the more recent trends in population change that have occurred during the pandemic, along with their housing market implications. However, these issues are addressed more directly and in greater depth in Section 4. This section concludes by considering the implications of 2006–2016 population trends on urban development policies.

2.2 Understanding residential mobility

The majority of Australians live within Australia's capital cities—with economic, lifestyle and cultural factors all informing these locational decisions (Davies and James 2011; James, Rowley et al. (2021). Over the last decade, these preferences of both Australians and migrants have placed considerable increased pressure on infrastructure, services and housing, resulting in a need to better understand the drivers that inform location choices.

Households move for a combination of interrelated reasons that extend well beyond the physical dwelling itself, reflecting employment, health and education services, recreational facilities and lifestyle opportunities, all of which are attached to a dwelling in a given location (Davies and James 2011; Marsh and Gibb 2011). A move will take place when the factors pulling a household to a destination are sufficient to overcome its inertia (Lee 1966).

Attachment to place can influence both the desire to move (Clark and Coulter 2015) and the desire to stay put (Duque-Calvache, Clark et al. 2018). For example, proximity to family and friends features more in the decision to stay rather than to move (Clark 2017). Some households move, but remain within the vicinity of their original dwelling, which Clark, Duque-Calvache et al. (2017) explain as being demonstrative of this attachment. A majority of residential moves in Australia are over short distances: 10 kilometres or less (Productivity Commission 2014). This tends to confirm the strong role that attachment to place plays in informing the migration decisions of Australian households (Clark and Maas 2015).

Previous research on mobility shows that Australian households tend to have a preference for stability, with housing moves generally considered risky (Morrison and Clark 2016). The decision-making process around residential mobility is rarely as simple as a cost-benefit analysis (Marsh and Gibb 2011). However, Clark and Lisowski (2018) find that the most likely catalysts to create an intention to move are an adjustment in the life-course stage of the household, combined with employment loss or change.

As households move through the life cycle, they make decisions around housing consumption: dwelling type, tenure and location. Seminal work by Rossi (1955) links residential mobility to the physical structure of the dwelling—particularly space. Since the 1950s, the life cycle has become more fluid, and events such as leaving home, getting married or having children are less associated with age, which means that household composition and mobility is more dynamic and a life-course approach has been adopted (Clark 2017).

Households still adjust their housing during the life course in response to changing needs and priorities, but these are now linked to work, relationships and changing household structures (Clark 2017). The decision to move is distinct from the selection of location, which is informed by a wider set of variables—such as employment, lifestyle, education and access to services (Clark and Lisowski 2017; Davies and James 2011; James, Rowley et al. 2019; Productivity Commission 2014; Speare 1974). Location selection is also informed by housing affordability—a factor that drives mobility of both home owners and renters in Australia (Baker, Bentley et al. 2016; Rowley and James 2018).

Residential mobility, moving house in the same neighbourhood or to a different one carries a large degree of risk and is a stressful life event (Clark and Lisowski 2017; Morrison and Clark 2016). Households have an aversion to this risk, or the potential loss of what they possess because of the use value that they place or endow on their dwelling. Overall, those who are more risk averse are less likely to move (Clark 2017; Whelan and Parkinson 2017).

In advanced economies, most households move to improve their locational advantage. Forced residential mobility most often occurs in Australia when households wish to remain in a given location but find themselves forced to move in response to lease arrangements, unaffordable housing (Baker, Bentley et al. 2016; Rowley and James 2018), or poor quality housing (Desmond, Gershenson et al. 2015). Evidence suggests that lower-income households, renters and younger families move more frequently than others (Baker, Bentley et al. 2016; Coulton, Theodos et al. 2012; Productivity Commission 2014; Whelan and Parkinson 2017).

Some households may wish to move away from their current dwelling or location, but are unable to do so because of employment arrangements or the availability of affordable or appropriate housing (Duque-Calvache et al. 2018). In Australia, there are strong links between residential mobility and geographic labour mobility (Productivity Commission 2014). In urban areas, households are less likely to have to move to find work because it is often possible to access a range of work opportunities within commuting distance from home (Molloy, Smith et al. 2017).

However, long-distance commuting practices do shape population flows in Australia. For example, fly-in fly-out employment involves regular population movement for employment (Cresswell, Dorow et al. 2016). Such moves are not without cost to households, government, employers and communities (Productivity Commission 2014). Individuals moving for employment-related reasons move more regularly than most, as do young people, overseas migrants, single people or highly educated or skilled individuals.

Young people move for a range of reasons, including furthering education, employment and social opportunities (Davies 2008). A combination of career aspirations and familial ties are more likely to pull young adult migrants to a specific location rather than the characteristics of that location (Crescenzi, Holman et al. 2017).

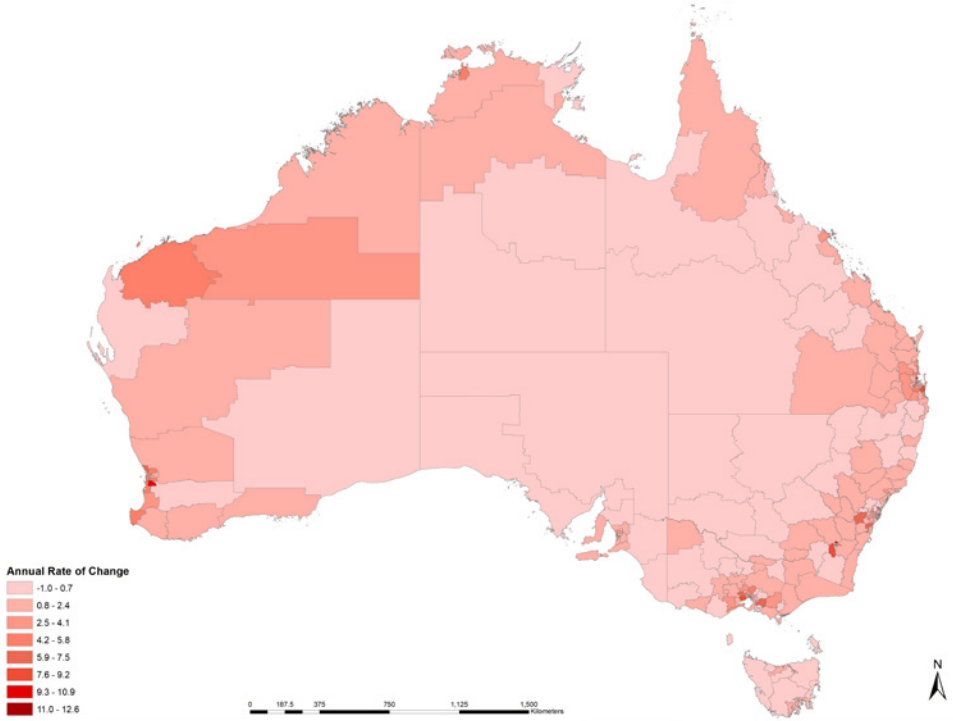
2.3 Population trends and their drivers before the COVID-19 pandemic

Just over 64 per cent of Australia's population lives in cities of over 1 million people, and a further 10.6 per cent live in medium-size cities of between 100,000 and 1 million population (AGDPMC 2019). Regional towns of up to 10,000 people account for just under 10 per cent of the population, while only around 5.6 per cent of the population live in rural properties. Australia's population is heavily concentrated along the east coast, particularly in the major capital cities. This reflects historical settlement patterns, the economic dominance of the major cities and the liveability factors of these geographic locations.

Population change, concentration, trends and projections were analysed in detail in one of this Inquiry's SRPs (James, Rowley et al. 2021). This SRP analyses population growth at the Statistical Area Level 3 (SA3) spatial unit. An SA3 has a population between 30,000 and 130,000 people and is designed to encompass the functional areas of towns and cities with similar regional characteristics, administrative boundaries and labour markets (ABS 2011).

There are 333 SA3s that cover Australia, of which 44 per cent are outside the metropolitan boundaries. Between 2017 and 2018, capital city growth accounted for 79 per cent of Australia's total population growth. Between 2017 and 2018, the number of people living in Australia's capital cities increased by 2 per cent, whereas the national averaged growth rate was 1.6 per cent (ABS 2019). Melbourne, Australia's second largest city, experienced one of the largest rates of growth at 2.5 per cent (ABS 2019), and much of the growth that occurred outside of capital cities was concentrated in large cities that are within commuting distance to a capital city. These spatial patterns are shown in Figure 1, which maps the annual rate of population change between the census years 2006 and 2016.

Figure 1: Distribution of Australia's population growth, 2006–2016



Source: ABS 2019.

Concerns have been raised about the capacity of these cities to accommodate future growth. As the AGDPMC comments:

> The Government recognises that the current rate of growth, and its concentration in major cities, has heightened existing pressures in these cities, leading to rising congestion and reduced liveability. The Government has decided to reduce the permanent migration program ceiling by a cumulative 120,000 places over four years. This is designed to reduce pressure on Australia's major cities while new arrangements for improved planning across governments and more infrastructure are put in place to manage long-term population growth and settlement across Australia (AGDPMC 2019: 18).

Population growth (or decline) does not just result in change in the absolute number of people in a community, but can also result in changes to the demographic structure of a community. Much of Australia's population growth has resulted from international migration. The concentration of migrant populations into particular locations has resulted in a statistical overrepresentation of some ethnic or age groups in particular locations (Davies and James 2011).

Similarly, some locations may have an overrepresentation or underrepresentation of people with social advantage or disadvantage (see ABS 2018). For example, the population growth being experienced in high-amenity settlements in south-east Queensland and northern coastal New South Wales is being driven by the movement of older Australians as they seek warm climates and high-amenity, well-connected settlements for their later life phases (Davies and James 2011). Importantly, sustained changes in demographic structure drive changes in demand for services, infrastructure and housing.

James, Rowley et al. (2021) examine the principal drivers of convergence and divergence of actual population change with prior sets of population projections. They argue that this generates insights to the economic, planning and cultural drivers of population change, and note that population projections provide a useful tool that policy makers can use to determine future infrastructure needs.

James, Rowley et al. (2021) note that major cities tended to gain population broadly in line with prior projections, but that outer suburban areas of major cities tended to gain population at a much greater rate by 2016 than had been projected in 2000. James, Rowley et al. emphasise that population projections do not account for land development for residential housing, as they are based on the cohort-component method. Urban infill, development of high-rise apartments and the outward expansion of residential areas of cities has underpinned the greater than projected population growth in most major cities in Australia. The rezoning and upzoning of sites during the population-projection period gives rise to greater than expected population change. This is also true for sites brought forward for development that were not within scope during original population projections.

Other types of planning controls, outside broad zoning, were another factor that James, Rowley et al. (2021) identify in their research as generating a mismatch between the forecast and actual populations. They point out that while planning controls stipulate a minimum lot size, there is no maximum, and that planning controls in urban growth areas are drafted with flexibility in mind. As markets shift over time, a combination of affordability pressures and growing appetite for smaller lots can combine to increase density more quickly than planned. Elsewhere in their case studies, James, Rowley et al. (2021) find that divergences between assumed and actual household sizes forecast for development areas had a significant impact on population outcomes. They also find that particularly strong population growth tended to be associated with rapid development of greenfield locations, with new residents attracted by the availability and relatively low price of development land.

Areas that had lower than expected rates of population growth were often found to suffer from structurally ageing populations. Areas in which people aged 65 years or older decided to age in place, or see others move into the area to retire, were also associated with outward migration of younger cohorts, either for study or employment. Migrants were not necessarily targeting metropolitan cities, but often migrate to regional centres. Some were attracted to low-growth areas by 'key worker' employment opportunities. The role of temporary migration due to life-cycle factors, with the possibility of later return, was also highlighted in the qualitative work.

James, Rowley et al. (2021) note that mobility is linked to the availability of services and amenities valued by residents, including transport, health, education, policing, childcare and recreation infrastructure. Their qualitative work demonstrates a link between insufficient state and federal investment in infrastructure and services, and subsequent low population growth. Good, affordable transportation infrastructure was highlighted as a particularly important factor in rendering a location as a good place to live. In addition, poor levels of education and health services were described as important drivers of people leaving low-growth areas, as they are attracted to alternative locations with better provision of such services. In particular, proximity to major facilities such as hospitals, airports, health campuses and education campuses was put forward as having a disproportionate effect on attracting households that were deciding to move.

Finally, James, Rowley et al. (2021) reflect how population losses can also be the result of technology advances, or changes to economic conditions. Technological advances have been associated with large-scale job losses in the mining industries, and in the agricultural sector. Structural unemployment of this type tends to be spatially concentrated, and triggers population movement. In addition, the fluctuations of commodity-driven local economies create waves of migration. Industries such as agriculture and mining are at the mercy of global markets and are seen to be volatile. Changes in commodity prices trigger very rapid changes to workforce numbers and structures.

One solution to delivering labour supply in regional Australia has been long-distance commuting—fly-in fly-out (FIFO) and drive-in drive-out employees—particularly in resource-sector communities since the 2000s (Haslam McKenzie 2016; Mayes 2020; McKenzie, Haslam McKenzie et al. 2014). Employees either live outside the town or urban centre and drive in daily, or fly in for a period of time. This model sees the population numbers in towns ebb and flow with the commodity price or demand cycles. However, recent changes to the FIFO operating models have also impacted upon population numbers. For example, a shift to using contractors to provide more of the labour force has significantly reduced the number of people permanently residing in population centres.

2.4 Drivers of mobility

2.4.1 Inter-censal trends

The SRP reported by James, Rowley et al. (2021) studied household mobility and locational choice using a mix of research methods, including econometric analysis of the HILDA survey dataset, and quantitative analysis of the 2019 AHURI-funded Housing Aspirations Survey.

A number of interesting findings are worth highlighting in this Inquiry Final Report. For example, James, Rowley et al. (2021) found that around one-third of their respondents in the Housing Aspirations Survey desired moving to a different category of location, with a sizeable number of respondents desired relocating in a CBD, inner suburbs or a small regional town. This was based on a classification that included:

- the central business district (CBD) of a capital city
- inner suburbs of a capital city
- middle/outer suburbs of a capital city
- regional city or large town
- small regional town
- remote community.

By contrast, a large number of respondents were averse to living in the middle/outer suburbs, or wanted to relocate from them. This is particularly interesting in the context of the recent pronounced trends emerging during the COVID-19 pandemic, in which demand for living in regional locations has increased dramatically.

However, the James, Rowley et al. (2021) study finds that those aspiring to move to regional towns are much more likely to be in older age cohorts. This suggests that recent trends are an acceleration of a trend evident before the pandemic, rather than an altogether new phenomenon.

Their analysis of movers in the HILDA data show that age and life-course transitions such as marriage, the arrival of children, income and employment are important drivers of the mobility decision. James, Rowley et al. find that becoming unemployed is a particularly significant driver. Interestingly, they also find that lower levels of deprivation (measured by Socio-Economic Indexes for Areas [SEIFA]) at the point of origin is associated with moving to an area of higher deprivation, and hypothesise that this may be evidence that high housing-cost burdens lead to some movers being displaced to less affluent areas. They also found that private renters are more than three times as likely to move than owners. However, their analysis is unable to fully untangle a complex variety of possible effects, including:

- owners' aversion to moving because of tax settings and high transaction costs
- renters' possibly making enforced mobility 'decisions'
- place attachment, where each additional year of residence reduces the odds of moving by 3.7 per cent (although the interaction between place attachment and tenure is unclear).

The James, Rowley et al. (2021) study goes on to examine differences between urban–urban moves and urban–regional moves. They find a set of common drivers, including:

- changes to household composition—either formation or break-up
- health reasons
- wanting to be nearer to other family members.

Urban–urban moves are more likely to be motivated by housing circumstances, including attaining home ownership or securing a larger dwelling, whereas urban–regional moves are more likely to reflect lifestyle factors or a change in employment.

Interestingly, regional–regional moves are also much more likely to reflect housing factors than regional–urban moves. Overall, the results are highly suggestive that moves within the urban/regional classification reflect life-cycle factors and the housing career, while those involving a jump to a different classification are more likely to reflect a change in pace of career—either up or down.

2.4.2 More recent trends

Although the quantitative and qualitative strands of the research undertaken in this Inquiry, and its SRPs, was designed and commissioned before the COVID-19 pandemic, much of the work was undertaken early or in the midst of the pandemic.

Inevitably, the national and international news—and direct experience of living and working in lockdown—affected participants greatly. Many questions were being asked in the media and by other commentators about how the pandemic would be likely to change living, commuting and working practices on both a temporary and a more permanent basis. There was a great deal of speculation about the possible consequences for housing demand in terms of:

- what would be in higher demand in the future—dwellings with additional rooms for home offices and schooling, and external space to allow access to fresh air and exercise
- where the demand would shift to—away from higher-density city centres to suburbs and regional locations.

A number of reports and analyses with a focus on changing patterns of demand and population change were published during the pandemic. For example, Johnson, Mundell et al. (2020) noted that between 2017 and 2020, growth in house prices was already strong in regional areas. Examples specific to Victoria and Tasmania include Geelong at 18 per cent, especially the suburb of Newtown, Launceston / north-east Tasmania the highest at 30 per cent, Hobart at 29 per cent, Ballarat at 28 per cent, LaTrobe / Gippsland at 25 per cent, and Bendigo at 17 per cent (see a recent online webinar by Conisbee 2020).

After COVID-19 hit, there was a further surge in demand, with enquiries about regional Victoria increasing by 22 per cent, as people were perceived to be rejecting apartment living in Melbourne, and with different work patterns reducing the need to be close to workplaces.

According to the Real Estate Institute of Victoria, in 2020 Geelong ranked second in the frequency of areas viewed in website searches for domestic property in Victoria (after Mornington). Australia's most in-demand regional suburbs in the six months to May 2020 were:

- Bangalow—NSW north coast, adjacent to Byron Bay
- Thirroul—NSW south coast, close to Wollongong and within commuting distance to Sydney
- Woomona—NSW south coast, close to Wollongong and commuting distance to Sydney
- Geelong West, Belmont and Jan Juc (Conisbee 2020).

NSW Department of Planning Industry and Environment ([NSWDPIE] 2020) note that in the early months of the pandemic, the largest effects on interstate migration were seen in Victoria—but were caused by a reduction in numbers coming into the state, rather than an increase in people leaving. They also note a net gain in the NSW population coming from Victoria (for the first time since 1997). They report a reduction in vacancies in regional areas and the outer suburbs of Sydney, suggesting that people are not necessarily moving to regional areas, but may also be decentralising within major cities.

The Real Estate Institute of New South Wales (Ross 2020) point out that regional areas offer a number of advantages that have become more important as a result of COVID-19. They are that:

- people can work from home effectively
- people want to leave large, densely populated communities
- people appreciate simpler lifestyles
- many people are seeking a sanctuary, a safety retreat from COVID-19.

However, commenting on the ABS (2021) Q3 regional internal migration estimates, Davies (2021) points out that although the 11,200 people moving out of capital cities and into regional areas in the September 2020 quarter may represent a record, it is nevertheless a very small element of the total population. The lack of appropriate and diverse local employment opportunities remains a major barrier for those seeking to move from capital cities for lifestyle reasons, but still desiring or needing to remain active in the labour force. The ABS (2021) data show that 76,200 people moved interstate in Q3 2020, and that this was 10,600 fewer than the corresponding quarter in 2019. Of course, it is impossible to tell what impacts the frequent and repeated internal border closures in Australia had on this trend.

The ABS data show that population loss from Sydney and Melbourne has been continuing for some time. Although the pandemic has increased the numbers, the overall volume remains very low. For example, 7,800 people left Sydney in Q3 2020 compared to 6,400 in Q2 2020. For the same quarters in Melbourne, the figures are 3,700 compared to 3,000. Queensland is reported to have seen a sizeable increase in inward migration (7,200 overall), with only 3,200 locating in Brisbane. The suggestion is that the remainder relocated interstate in regional Queensland.

In addition to short-term changes in preferences during the pandemic, there are much more significant consequences to longer-term trends. The Centre for Population (2020) point out that Australia's population is estimated to be around 4 per cent smaller (1.1 million fewer people) by 30 June 2031 than it would have been in the absence of COVID-19. The population will also be older as a result of reduced NOM and fewer births. Despite COVID-19, Australia's population is still growing and is expected to reach 28 million during 2028–29, three years later than estimated in the absence of COVID-19. COVID-19 is projected to slow population growth across all geographic areas analysed, with the duration and magnitude linked to the importance of NOM to different parts of the country. Capital cities are projected to bear the heaviest impacts, with total population across capital cities estimated to be around 5 per cent lower by 30 June 2031 than it would have been in the absence of COVID-19. By contrast, population outside the capital cities is estimated to be around 2 per cent smaller than it would otherwise have been.

Charles-Edwards, Wilson et al. (2020) used a scenario-based simulation approach and found that Australia's population could be 4 per cent lower by 2040 in a 'Severe' scenario than in the 'No pandemic' scenario, driven by a massive reduction in international migration. Impacts on population ageing will be less severe, leading to a 1 percentage point increase in the population aged 65 and over by 2040. They predict that the biggest declines will occur in the most populous states, but with the largest relative impact in Western Australia.

The National Housing Finance and Investment Corporation ([NHFIC] 2020) considered the implication of population scenarios on housing demand by considering a number of growth scenarios. These suggest that there may be significant consequences for underlying housing demand, or the demand for new housing from population growth and household formation. NHFIC estimate that underlying dwelling demand could fall by 129,000 to 232,000 dwellings between 2020 and 2023 under the three scenarios they considered. They note that if such a decline were sustained, then it would cause a contraction in construction activity that would add to the recessionary forces impacting the economy around the middle of 2020. Rowley, Crowe et al. (2020) also report that while the HomeBuilder policy had introduced a considerable stimulus to housing demand and development activity in 2020, there is a possibility of a demand vacuum later in 2021 and early 2022 if the policy proves to simply have brought forward existing demand.

The spatial impacts of population-change scenarios are also likely to be varied. NHFIC (2020) point out that NOM accounts for around 60 per cent of population growth, with about 50 per cent of this due to international students. Under pre-pandemic conditions, this induced considerable housing demand near inner-city peripheries and in apartment-style accommodation, with the bulk of demand in capital cities in the eastern states. NHFIC note that while eventually re-opening borders may lift student numbers, the economic fallout from the pandemic means it may take several years for student numbers to return to pre-COVID-19 recession levels. In addition, the rate of natural population increases in Australia tends to fall after peaks in the unemployment rate.

2.5 Implications for urban development policy

Housing considerations are a major driver of mobility and location-choice decisions, and housing tenure has the greatest impact on the decision to move versus stay among all the socio-demographic, work, income, housing and area-related predictors examined by James, Rowley et al. (2021) in their econometric modelling. This may reflect the inherent insecurity of private renters, the role of high transaction costs for owners, or some combination of these factors. Importantly, high transaction costs contribute to a lack of labour-market mobility on the part of Australian workforce, with knock-on consequences for the efficient functioning of labour markets. Interestingly, the qualitative evidence from the housing aspirations survey by James, Rowley et al. (2021) shows there is an appetite for movement between metropolitan and regional areas, and within regional areas, suggesting that policies enabling mobility will benefit regional housing and labour markets.

This section synthesises a range of complex reasons that underpin households' decisions to move home and location. It finds that moves are triggered by more than dwelling and locational preferences, but reflect employment, health, education, recreational and lifestyle-related services.

There are some distinct differences between cohorts. For example, younger people often move in order to further education, employment or social opportunities. Renters are inherently less stable than owners and move more frequently. But overall, there are strong links between residential mobility and labour mobility in Australia.

The research showed that population ageing coupled with outward migration of younger cohorts were important determinants of areas having lower than expected population growth between census years. Outward migration is often linked to employment of key workers in regional areas, and can be seen as temporary and linked to life-cycle reasons.

The evidence suggests that unemployment—both individual unemployment and the area level of unemployment—is an important determinant of people moving home. Australians are more likely to move long distance from regional to metropolitan areas as a result of a need to be closer to their place of employment or study. Metropolitan-to-regional moves also occur but are more likely to be prompted by lifestyle considerations.

The policy implications are that it is important to ensure that local housing supply can respond quickly to shifts in population demand. This requires state and local governments to implement land-release and infrastructure strategies that can quickly respond to demand shifts. In the case of metropolitan areas, housing supply needs to be responsive enough to meet the housing needs of workers and jobseekers in job-rich areas. This will help to ensure that potential productivity gains are not squandered in the form of rising house prices that may eat into wage increases or raise business costs (Ong, Wood et al. 2017). This point is also made by Nygaard, Parkinson et al. (2021) whose SRP found that the benefits of productivity arising through agglomeration disproportionately benefit higher-income groups, while housing costs actually increase across the income distribution.

3. Can agglomeration economies help Australian cities?

- **Section 3 considers the international evidence on agglomeration economies and their impacts on economic productivity, and considers whether such effects also apply to Australian cities.**
- **Agglomeration economies occur through three principal processes: labour pooling, shared-input markets and technological spillovers. In theory, these processes should increase productivity as cities become larger or denser.**
- **A review of international approaches to planning for economic growth reveals a number of unique approaches that could be adapted to the Australian context. These include polycentric development, regional development linked to technology clusters, and identification of designated growth centres within an economic diversification strategy.**
- **The econometric evidence shows that agglomeration increases productivity at the city scale for US cities, but the evidence is weaker for European and Australian cities.**
- **When moving below the metropolitan scale, there is stronger evidence that benefits also apply to Australian cities. There is no evidence of diseconomies arising from scale.**
- **Employment density is also important to productivity, but the effects appear to peak between the level of the neighbourhood and the metropolitan level.**
- **After controlling for firm and individual-level characteristics, the estimates of agglomeration advantages are much lower than in earlier reported studies.**

3.1 Existing research on agglomeration economies and housing

A number of AHURI reports have focussed on the potential productivity-enhancing benefits for housing and affordable housing supply (Dodson, de Silva et al. 2017; Gurran, Phibbs et al. 2015; Maclennan, Ong et al. 2015; van den Nouwelant, Crommelin et al. 2016). Maclennan, Ong et al. (2015) argue that housing investment can provide an important economic stimulus through aggregate demand expansion, but they also conclude that there is little evidence on the long-run growth and productivity impact of housing. Gurran, Phibbs et al. (2015) argue that labour-market mobility, participation and employment are affected by housing-system outcomes, and note that housing affordability has a feedback effect to labour markets through raised wage demands. Van den Nouwelant, Crommelin et al. (2016) also note Australia's escalating commuting times and a growing mismatch between low-income employment and low-income housing opportunities, with a knock-on impact to economic productivity.

More recently, Maclennan, Randolph et al. (2019) articulate several other possible channels from housing outcomes to economic productivity. These include:

- household incomes diverted from non-housing to housing consumption—inflation increasing housing values and reducing overall non-housing consumption
- displacement of lower-waged workers from centres of business creation and innovation.

Australia's labour productivity is below the rate required to maintain its historic per capita income growth rate of 2.5 per cent (Campbell and Withers 2017). This, together with an apparent slowing of economic productivity in Australia's main cities, and a sharp reversal in NOM trends since the beginning of the COVID-19 pandemic, conspire to push Australia's growth strategy high up the policy agenda. In this context, the concept of agglomeration economies is an important one, as it conjures up the idea that improvements in economic productivity, and hence economic growth, may arise through realising different urban and regional growth strategies.

Yet, although agglomeration economies are frequently discussed by economists and policy makers, they can be difficult to measure, and econometric estimation strategies are fraught with empirical issues—including the need to fully account for endogeneity in the relationships between causal variables. There is already an extensive literature on agglomeration economies, but it is heavily focussed on other countries—notably the United States and, to a lesser extent, European and Asian countries. There is particularly strong evidence to suggest that agglomeration increases productivity in US cities (Ahlfeldt and Pietrostefani 2019; Brülhart and Mathys 2008; Carlino, Chatterjee et al. 2007; Ciccone and Hall 1996; Combes and Gobillon 2014; Duranton and Puga 2020; Melo, Graham et al. 2009; Rosenthal and Strange 2004).

There are also some apparent contradictions. For example, Glaeser and Gottlieb (2009) suggest that attracting workers to an area will boost local productivity through human capital spillovers, but it has also been shown that low-income workers, and households with benefit recipients tend to gravitate towards areas with stronger employment opportunities. Glaeser and Gottlieb (2009) also caution that the existence of agglomeration economies does not necessarily imply that policy intervention should facilitate interventions designed to move population.

There is relatively little existing empirical evidence to suggest that agglomeration economies are as important to Australian cities, or to demonstrate the scale of the effects. Furthermore, previous Australian research has drawn on area-level productivity measurements. For example, Rawnsley and Szafraneic (2010) estimate that the overall productivity gain from doubling effective jobs density in Melbourne is 7 per cent, or ranging from 0 to 29 per cent when estimated by industry. Trubka (2011) analyses labour productivity as the sum of the industry-specific average wages weighted by the share of employment in each industry. The analysis is conducted for each Australian capital city, with the predicted effect of doubling job density, ranging from 3.5 per cent in Perth to 36.7 per cent in Canberra.

There is also a gap in our understanding about the interaction between housing costs and productivity, as mentioned earlier. It can be argued that housing affordability is instrumental to productivity by enabling employment participation and better matching an individual's skills to the jobs available (Coulson and Fisher 2009; Ferreira, Gyourko et al. 2010; Oswald 1996; van den Nouwelant, Crommelin et al. 2016; Whelan and Parkinson 2017). A mismatch between the geography of affordable housing and employment concentrations is likely to be detrimental to economic development (SCITC 2018).

3.2 Australian cities and agglomeration: the potential

The theoretical arguments for expecting to find a relationship between city size and productivity can be traced back to Marshall (1890/1920), who defined three distinct effects arising from:

1. labour pooling
2. shared-input markets
3. technological spillovers.

The underlying argument is that concentration or clustering of production (firms) is associated with higher returns to scale, or greater productivity.

Agglomeration effects can also be categorised as urbanisation economies and localisation economies:

- *urbanisation economies* arise when the interactions between multiple sectors are productivity enhancing
- *localisation economies* arise when interactions within economic sectors are productivity enhancing (Duranton and Puga 2000).

The benefits of labour pooling and shared-input markets arise when places (cities) of great scale become associated with a greater diversity of firms of different types, sizes, specialisations or sectors to develop. This in turn allows firms to source more specialised labour and intermediate inputs to the production process, raising production efficiency and thus productivity.

Labour pooling

The availability of large pools of labour with a diverse range of skills reduces firms' hiring costs because they can access the range of skills they require directly from the local market. For example, consider the case of a rapidly growing firm in the agribusiness or mining economic sectors that reaches the point in its growth trajectory at which employment of highly specialised IT or cybersecurity professionals become essential to the business. Having their headquarter function located in a large urban centre that hosts a large and diverse pool of labour will greatly facilitate identifying and recruiting workers with specialist skills in these areas, which are not central to the firm's main business. Location in smaller centres without such diversity of skills would entail more costly search and recruitment processes.

Equally, if labour demands change, firms located in urban centres of scale can rapidly restructure the size and mix of their labour force. They can also adjust labour supply without incurring training costs because they are located in proximity to many available workers with a diversity of skills and experience levels. Workers also benefit from being close to large concentrations of employment because they can change jobs without moving home, move to better jobs, plan career moves and move from failing to growing firms. These firm and labour-market effects have been usefully explored and summarised by Duranton and Puga (2004) as 'learning', 'sharing' and 'matching' effects.

Shared-input markets

Economies of scale may also apply at the level of the firm, or of the city. At the level of the firm, the size of the firm itself may give rise to efficiencies, but these are internal to the firm rather than strictly a function of being located in a larger city. In relation to shared-input markets, it is clear that cities may gain economies of scale by reaching a size at which the provision of facilities or a type of service becomes possible or cost effective—for example, large-scale public buildings, sports facilities, museums, leisure and entertainment facilities may all fall into this category.

There is a well established and developed literature that explores the interactions between the presence of 'urban amenities', migration and economic productivity. This emphasises that more creative and productive workers are attracted to locations (cities) that have an abundance of natural, heritage, artistic, leisure and other recreational amenities. Many of these can only be efficiently provided by cities of a certain scale, and so such locations possess an advantage in attracting more productive workers.

Technological spillovers

On the other hand, it is also clear that technological spillovers occur when firms are operating in proximity and derive a knowledge dividend from that fact. Reporting on one of the SRPs under this Inquiry, Leishman, Bond-Smith et al. (2021) argue that knowledge spillovers reflect that a great deal of knowledge is tacit rather than codified and disseminated, and is usually exchanged through personal interactions or 'face-to-face' contacts in the course of work and business. These exchanges of tacit information are important in service industries and in innovation processes, where cross-firm trust can be important. Knowledge spillovers also arise when individuals in informal social and leisure settings exchange information and build trust. Developing these relationships of trust is argued to lead to a higher generation rate of new ideas and their faster transmission into innovations.

Implications of agglomeration economies

According to Nygaard, Parkinson et al. (2021), reporting on another of the SRPs in this Inquiry, agglomeration economies may also have temporal dynamics. They note that Brülhart and Mathys (2008) found evidence that agglomeration effects have increased over time and are driven by cross-sectoral effects—an urbanisation effect. Data availability inhibits testing this thesis in the Australian context.

Economists typically define 'productivity' as the amount of output produced by each worker, relative to the inputs available to them. When workers produce more output with the same amount of inputs, productivity can be defined as having increased. Where agglomeration results in greater productivity, businesses will benefit more from each worker and use some of this surplus to offer higher wages to attract labour. Higher wages compensate households for greater congestion costs, are assumed to be mobile across space, and improve their housing, working and leisure-time outcomes.

The international and Australian evidence suggest that there are positive productivity effects from agglomeration. However, the net benefits are mediated by the responsiveness of housing markets to demand, and by local supply conditions, regulation, and households' preferences for living and working in different locations. Subject to local supply restrictions, households choose locations based on the income obtainable in different labour markets or access to urban amenities. Rising housing costs associated with higher densities may reduce or eliminate the benefits created by agglomeration-driven productivity effects.

Where agglomeration leads to higher wages, there is a strong possibility that this will also lead to higher housing costs, because workers are incentivised to bid up the price of housing in order to secure access to more productive localities and higher wages (Glaeser and Gottlieb 2009). This process may be particularly problematic if the effects of agglomeration on wages are not uniform for all workers. For example, if some workers with higher human capital or skills in limited supply benefit disproportionately from agglomeration-driven productivity, then the result will be higher wages for those cohorts, and partial capitalisation in higher land values for all. This leads to greater income inequality and polarisation of housing outcomes, as housing becomes less affordable for those workers who are not in the more productive cohorts that benefit from higher wages.

Thus, while there is a strong and well-rehearsed consensus about the origins and different forms and contexts of productivity gains arising from agglomeration economies, there remain some unanswered questions. In section 3.1 we noted that there is a thin evidence-base supporting the existence of such effects in the context of Australian cities. In this section, we recognise that there are likely to be important interactions between housing-system outcomes, urban amenities and agglomeration effects, and that it is by no means certain that such effects are uniform across all population and labour cohorts. It is worth asking: are there housing outcomes of policies that are more or less likely to create a competitive metropolitan economy? We pick up again on this theme in Section 3.4.

3.3 The international evidence and implications for Australian cities

3.3.1 Planning for growth

This section addresses Inquiry research question 3:

> **How are Australian urban and regional governance frameworks planning for and responding to economic and population growth, and what can be learned from international experience?**

Gurran, Forsyth et al. (2021) carried out a detailed review of international case studies with a focus on planning for economic growth beyond dominant urban areas. They examined metropolitan, regional and continental approaches, as well as policies that included satellite cities or networks of cities interacting with a major urban centre. Their case studies included:

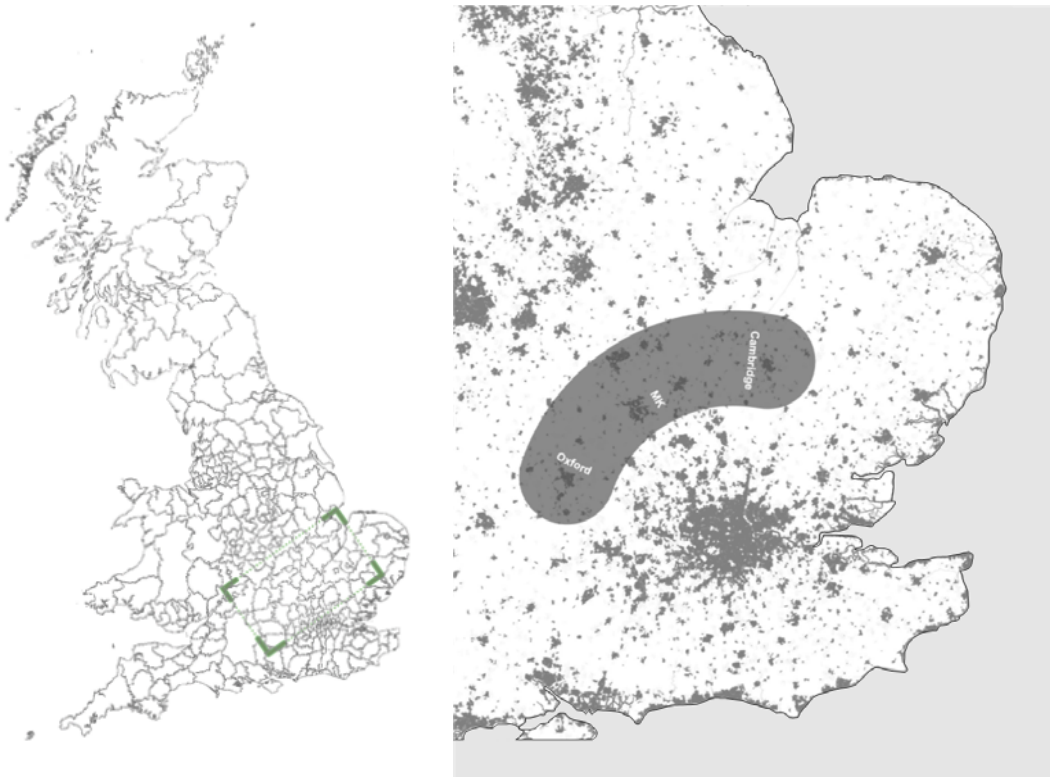
- **Europe:** the European Spatial Development Programme (ESDP) and European Spatial Planning Observatory Network (ESPON)
- **Canada:** Hamilton, Kitchener and the Greater Golden Horseshoe, Ontario
- **UK:** Manchester, England
- **UK:** Cambridge, Oxford and Milton Keynes, England
- **France:** Marne-la-Vallée, Île-de-France
- **UK:** Dundee, Scotland.

The report notes that ESDP and ESPON arose from an EU initiative designed to increase economic performance and social cohesion, with an underlying objective to coordinate urban development, infrastructure and conservation activities. A central goal was to ensure that less central developed regions could thrive by progressing polycentric growth. A more recent development is the adoption of 'Smart Specialisation Strategies', which requires regions to identify a domain of specialisation and set key priorities. Gurran, Forsyth et al. (2021) further note a recent shift away from weaker regions to cities, with a particular focus on cities over 300,000 population. The authors suggest that an Australian equivalent might be a national settlement strategy to secure balanced growth involving thriving regional areas that reduce pressure on core urban centres.

Marne-la-Vallée is the only one of five new satellite towns in the Paris region that has continued to grow into the 2000s (Bowie 2013). Gurran, Forsyth et al. (2021) note that it initially developed more slowly than the other four towns, and reached a population of 290,000 by 2010. The five satellite towns were developed as the outcome of a regional planning process that identified a need to decentralise population and employment, to assist the development of a polycentric urban region. While the region benefits from an express railway and international train station, parts of the region are more distant from Paris, and Gurran, Forsyth et al. (2021) draw a parallel with satellite cities such as Geelong and Wollongong. They note that although the region has a particularly complex urban planning and development institutional environment, it has achieved strong job growth centred on Euro Disneyland and around the 'Advancity' sustainable city and transportation cluster of activity.

The Oxford to Cambridge Arc (O2C) (see Figure 2) was a concept devised, funded and marketed by regional development agencies to promote a band of counties 80 kilometres north-northwest of London between 2003 and 2009. The idea was to build upon an existing golden triangle of leading UK biotech clusters to increase collaboration between organisations in the region, and to join up the two university pole cities of Cambridge and Oxford, which are home to very substantial concentrations of technology, biotechnology and support organisations. Milton Keynes, a New Town dating from 1967, was designed to ease overcrowding in London and Birmingham and was intentionally placed between Cambridge and Oxford on the M1 motorway corridor. Between 2010 and 2016, Milton Keynes saw the highest percentage growth in employment of any UK city (29 per cent).

Figure 2: London satellites context (left) and O2C arc components (right)



Note: MK refers to Milton Keynes.
Source: Adapted from 5th Studio SQW (2018).

Gurran, Forsyth et al. (2021) point out that Cambridge and Oxford are among the oldest and strongest universities in the world, and so their cities are exceptional cases, which probably limits the extent to which the Milton Keynes success story could be replicated elsewhere. However, there is a more general lesson that more typical regional cities can generate strong local innovation, specialist employment growth and clusters of innovation through a combination of housing strong universities and having good connectivity to larger centres.

In their Canadian case study, Gurran, Forsyth et al. (2021) note that Hamilton and Kitchener are satellite cities within commuting distance of Toronto, Ontario. They draw parallels with Wollongong, near Sydney, or Geelong, near Melbourne. Hamilton and Kitchener recorded growth in technology jobs of 52 per cent and 40 per cent respectively between 2014 and 2019. It is important to note that both cities lie within the designated economic engine of the province, the Greater Golden Horseshoe. However, Hamilton lies within the heavily urbanised inner ring, while Kitchener is located within a larger but more diverse area in the outer ring, which is protected by a greenbelt. The key planning interventions include the identification of 25 urban growth centres and a deliberate transition from manufacturing and agri-food sectors towards knowledge-intensive, high-value-added activities. The strategy is underpinned by infrastructure funding for transport connectivity and targeted support for high growth, new economy economic sectors.

Analysis of the two remaining UK case studies (Manchester and Dundee) emphasises urban renewal objectives. Manchester reinvented and rebranded itself as a city through a combination of good accessibility to other cities in the UK, and particularly Northern England, inter-city rail links, as host to world-renowned football teams, an international airport and its governance by a metropolitan-scale strategic planning authority (Greater Manchester Combined Authority [GMCA]). Manchester had a strong post-industrial legacy in the 1980s, coupled with high unemployment and high crime levels. Government-sector-led developments focussed on rebranding around culture, tourism and events, including the 2002 Commonwealth Games, quayside development, theatres, art

galleries and museums. Its award of an infrastructure-focussed city deal in 2012 was also instrumental to its success. However, Gurran, Forsyth et al. (2021) sound a cautionary note because economic development and the creation of jobs have been perceived as uneven, with many in peripheral areas of deprivation having missed out on the benefits. They suggest this may be a limitation arising from concentration on rebranding without sufficient emphasis on job creation.

Overall, Gurran, Forsyth et al. (2021) observe a recent shift in regional economic policy towards a focus on place-based specialisation and competitive advantage. Within this model, infrastructure and funding investments seek to support growth, in part, by improving transport connectivity to larger centres, but also by supporting internal networks within and between regional areas.

3.3.2 Productivity benefits of agglomeration economies

Sections 1.2, 3.1 and 3.2 synthesise the theoretical and empirical literature on agglomeration economies, emphasising that there is now a well-developed body of literature suggesting the existence of such effects. The literature emphasises the North American experience, but there are also numerous studies of the European and Asian context. In this section, we summarise the findings of empirical work carried out in the Inquiry SRPs, which were designed to determine whether economic productivity benefits are likely to accrue to Australian cities by virtue of population size or density. The section addresses Inquiry research questions 2 and 4:

> **At what population and geographic scales do agglomeration economies begin to alter the economic productivity of cities, and at what stage do these advantages begin to slacken off or give rise to diseconomies?**
>
> **How can the benefits of agglomeration economies be quantified in the Australian context? This includes evaluation of housing market effects, employment density, market potential, traffic congestion / commuting times / pollution and wellbeing, and differences between household types and/or socio-economic groups.**

This subsection is mainly concerned with Inquiry research question 2. Subsection 3.3.2.2 picks up on Inquiry research question 4—evaluating the wider context of agglomeration effects, including unintended outcomes.

3.3.2.1 City scale and productivity

One of the Inquiry SRPs examined the relationship between productivity—as proxied by the real wage rate—and city scale (population). The empirical work examined US, EU and Australian cities, using datasets briefly described below. The modelling approach was based on Ahrend, Lembcke et al. (2017), which posits productivity differentials between cities as a function of city population and other city-specific characteristics.

$$\ln(y_{it}) = yr_t + a\ln(pop_{it}) + \Sigma_j b_j ch_{ijt} + x_t + z_i + \beta\ln(h_{it}) \qquad (1)$$

Where ch_{it} and z_i represent time-varying and non-time-varying city characteristics, while x_t represents time-varying characteristics that affect all cities. The term j indexes the type of city characteristics that may vary over time and can be treated as a time-fixed effect without being observed, while z_i is the city-specific productivity differential that is not explained by the other explanatory variables.

In addition to the standard model shown in (1), Leishman, Bond-Smith et al. (2021) experiment by splitting the population variable and expressing as population below, between and above a set of arbitrarily chosen threshold levels. The purpose is to determine whether any non-linearity is likely to exist in this relationship, and whether productivity gains from agglomeration appear at or above a certain size of city (in terms of population). The models were estimated separately for the US, EU and Australian datasets.

The US dataset covered the period 2010–2017 and the observational units were cities/metropolitan areas. Income per capita was set as the dependent variable and total population as the main independent variable, but variables were also included to measure a range of concentrations of levels of educational attainment and a selection of labour-market variables. Concentration of employment in a total of 12 industries or economic sectors was also measured.

The EU dataset spanned 2000–2016 and was sourced from Eurostat. It included a similar set of variables to the US dataset, with 21 variables relating to income, education, population, industry and employment. Employment weighting to 13 industry groups was also included, in addition to a set of educational outcome / concentration variables. However, for the latter, some imputation and reweighting was necessary in order to overcome disparity between the availability of variables and the unit of geography used in the analysis (full details are in Leishman, Bond-Smith et al. 2021).

The Australian dataset covered the period 2011–2016—a much shorter period than the EU dataset but comparable in length to the US dataset. It was extracted from the ABS Regional Statistics. We start with the data at Statistical Areas Level 2 (SA2), and then construct the data for the Significant Urban Areas (SUA) or city level. Specifically, we categorise the SA2s into their associated SUAs on the basis of the list provided by ABS. There are 34 variables in the Australian dataset, including:

- working age and total population
- population density
- employed and unemployed people
- the participation rate
- concentration of employment in 20 industry groups
- mean employee income.

The dataset also includes an array of education variables describing percentage of persons with Bachelors Degree, Postgraduate Degree, Certificate, Advanced Diploma, and Year 12 completion.

The results of the main models based on US, EU and Australian data are summarised in Box 1.

Box 1: Wage to population elasticities

US cities: 0.076—moving from a city of 500,000 to 1M gives a 7.6 per cent higher wage rate

EU cities: 0.144—moving from a city of 500,000 to 1M gives a 14.4 per cent higher wage rate, but this result is not statistically significant

Australian cities: 0.061—moving from a city of 500,000 to 1M gives a 6.1 per cent higher wage rate, but this result is not statistically significant

The results from the simple, initial models—that is, without threshold effects—therefore suggest that the relationship between city scale (agglomeration) and productivity (proxied by wages) is only statistically significant in the US dataset. The EU and Australian estimates are similar in magnitude, but are not significant. This is explored in more detail in the subsequent threshold models, with a summary of results shown in Box 2.

Box 2: City scale and threshold effects

US cities

Lower threshold	99,725
Elasticity at lower threshold	0.065–0.071 (weak significance: 10%)
Second threshold	108,945
Elasticity at second threshold	0.068–0.074 (weak significance: 10%)
Third threshold	153,972
Elasticity at third threshold	0.032–0.057 (not significant)

EU cities

Lower threshold	480,100
Elasticity at lower threshold	0.144–0.171 (not significant)
Second threshold	527,400
Elasticity at second threshold	0.148–0.167 (not significant)
Third threshold	736,500
Elasticity at third threshold	0.144–0.172 (not significant)

Australian cities

Lower threshold	15,192
Elasticity at lower threshold	0.056–0.073 (weak significance: 10%)
Second threshold	43,166
Elasticity at second threshold	0.066–0.083 (significant)
Third threshold	123,820
Elasticity at third threshold	0.079–0.086 (significant)
Elasticity above the third threshold	0.084–0.086 (significant)

As Box 2 outlines, the population thresholds chosen for the US, EU and Australian datasets are quite different. To an extent, the choice of thresholds is arbitrary, but the choices were also driven by the number of observations (cities, years) in each dataset and by the size of the geographical units for which the data were available. It is notable that the geographic units in the EU dataset are much larger than the US and Australian equivalents, and it is possible that this distorts the result. Certainly, the results for the EU threshold models are not illuminating because none of the terms are significant. Leishman, Bond-Smith et al. (2021) attribute this to the large scale of the observation units. They suggest that while there may be agglomeration effects at work, the quality of the data renders it impossible to estimate the effects properly.

The US and Australian results are more interesting. For the US cities, the elasticities are smaller in the threshold model than the simpler model with no threshold effects. The elasticities are smaller for the lowest thresholds, and increase with the thresholds. This seems to suggest that agglomeration economies begin to appear at a small city scale (about 100,000 population), and that there is evidence they become larger—the elasticities become larger, so the effects are non-linear—as cities grow larger. However, it is important to note that only the lower thresholds (99,725 and 108,945) have statistically significant effects. Taking the simple model and the threshold model together, this could be argued to imply that agglomeration effects are significant overall for all cities, but weaker at the smaller city scales. There is no evidence of a drop in productivity at higher city scales—this would be a negative effect implying diseconomies. We interpret this to mean that city scale would need to become very large—well above the scales observed in the US, European and Australian data—before diseconomies arising from congestion and pollution arise.

For the Australian cities, the results suggest that the threshold effects are very important. City scale is statistically significant when the data are stratified according to thresholds. However, the first threshold—which is very small in the case of the Australian data at 15,192—is only weakly significant. The elasticity of productivity with respect to population increases as we move up the thresholds, and there are model estimations for which this effect is statistically significant at every threshold. In general, the effect increases with city scale—elasticity begins at 0.056 at the first threshold but increases to as much as 0.086 above the final threshold. This implies that city scale does increase productivity, and that the effect accelerates with city size. The results also suggest that there are no diseconomies of scale in Australian cities.

3.3.2.2 Employment density and productivity

The Inquiry SRP reported by Nygaard, Parkinson et al. (2021) explore the role of geographic scale in more depth. Nygaard, Parkinson et al. examine the relationship between employment density and productivity at individual respondents' place of work (identifiable at POA level) using fine-grained (SA2) and broader (SA4) level agglomeration measures: density, market potential, economic diversity, economic specialisation. Specifically, Nygaard, Parkinson et al. combined data from waves 17 and 18 of HILDA with data from the ABS Census TableBuilder in order to generate a panel dataset of wages, employment density and control variables for individual and firm-level and institutional-level characteristics.

Nygaard, Parkinson et al. (2021) find broad support for the idea that higher levels of employment density increase productivity. They estimate that a doubling of density increases productivity by 1 to 4 per cent, with OLS (ordinary least squares) results yielding somewhat smaller estimates than instrumental variable results. Importantly, Nygaard, Parkinson et al. also note that estimates drop dramatically—by around 60 per cent—when individual and firm-level characteristics are controlled for. Overall, the results are lower than previous work on Australian cities. Trubka (2011) found agglomeration elasticities ranging from 3.5 per cent to 36.7 per cent, with estimates for Sydney and Melbourne being around 7 per cent or 8 per cent. The findings suggest the following.

- The characteristics of individuals and firms are important determinants of productivity and must be accounted for in the empirical estimations. However, these do not necessarily represent agglomeration effects.
- Spatial scale is important. There is some variation in the estimates when comparing across SA2 and SA4 level agglomeration inputs, particularly relating to the presence of urbanisation and localisation economies.

These findings resonate with the findings from the earlier literature review, and emphasise the existence of many forms of endogeneity that make it difficult to derive robust and unbiased estimates of agglomeration effects. The Nygaard, Parkinson et al. (2021) modelling approach includes individual-level control variables, such as:

- gender
- age
- marital status
- socio-economic status
- skill level
- country of birth
- skill level
- employment type.

Firm-level variables include:

- industrial classification
- firm size in terms of number of employees
- number of locations.

The model also includes measures of:

- industrial diversity—urbanisation economies
- relative specialisation—localisation economies.

The inclusion of this extensive array of control variables reduces the estimated agglomeration elasticity by some 60 per cent, which shows that there is a strong endogeneity between employment density and the propensity of firms / employees to locate or take-up employment. However, it must be emphasised above all that agglomeration effects have not been extensively studied in the Australian context, so it is very difficult to draw firm conclusions on our finding that agglomeration effects in our findings are much weaker than those found in the very limited amount of previous work in this area.

The divergence of the empirical findings between the SA4 and SA2 units of measurement is also interesting. In Subsection 3.3.2.1 it was reported that agglomeration effects on productivity were not found to be significant for EU cities, which were measured using much larger spatial units than those used for US or Australian cities. But below the metropolitan scale, this effect appears to reverse, at least to some extent. Nygaard, Parkinson et al. (2021) note that the effects of employment density on productivity are somewhat stronger at SA4 than SA2 levels. This is also true for economic diversity, which was found to be insignificant at SA2 but weakly significant at SA4 level. Furthermore, industry specialisation—which is argued to be a factor driving localisation economies—was found to be positive and statistically significant at SA2 and SA4 levels, with the effect having a somewhat higher magnitude at the SA4 level. The analysis also attempts to adjust for endogeneity in employment density. In the alternative instrumental variable (IV) estimates, the diversity and specialisation effects are generally greater at SA2 level, but only marginally changed at SA4 level.

A surprising finding in this context is that market potential variables were not significant at either SA4 or SA2 levels, and become negative in an alternative IV estimation. Given that such variables are intended to measure the effect of economic activity in surrounding, nearby or contiguous spatial units, this finding seems to contradict the general direction of findings that agglomeration effects from employment density are stronger at the larger of the sub-metropolitan spatial scales. A potential explanation for this is the nature of variable construction. At SA4 level there is also some evidence of collinearity between SA4 employment density and nearby economic activity that biases the point estimates. When dropping market potential, the SA2-level and SA4-level estimates become comparable. In other words, despite extensive steps to control for endogeneity between employment density and market potential—which is the density of economic activity in nearby 'areas' within a city—it appears that these measures are too closely related to fully separate the effects.

3.4 Agglomeration economies: policy development implications

This section considers the international evidence on agglomeration economies and their impacts on economic productivity, and considers whether such effects also apply to Australian cities.

Agglomeration economies occur through three principal processes: labour pooling, shared-input markets and technological spillovers. In theory, these processes:

- improve the matching between employment opportunities and workers' skills
- reduce production costs
- increase productivity by accelerating knowledge exchange.

As cities become larger or denser, these processes should increase productivity.

A review of international approaches to planning for economic growth reveals a number of unique approaches that could be adapted to the Australian context. These include:

- polycentric development of satellite cities linked to major metropolitan centres
- regional development of a network of decentralised centres linked to technology clusters
- identification of designated growth centres within an economic diversification strategy.

The econometric evidence shows that agglomeration increases productivity at the city scale for US cities, but the evidence is weaker for European and Australian cities. Interestingly, there is some evidence put forward in one of the SRPs (Leishman, Bond-Smith et al. 2021) that large cities in closer proximity to other large cities—as in central Europe—exhibit stronger agglomeration / productivity effects. In that SRP, the concept is referred to as the 'borrowed size' effect.

Below the metropolitan scale, there is stronger evidence that benefits also apply to Australian cities. The evidence suggests that benefits begin at a fairly small scale (above 100,000 population) and increase disproportionately thereafter. There is no evidence of diseconomies arising from scale.

The evidence is that density is also important—but the effects are stronger at the larger of the sub-metropolitan spatial scale examined. This suggests that agglomeration effects operate most strongly below the metropolitan scale, but above the neighbourhood level. However, after controlling for firm-level and individual-level characteristics, the estimates of agglomeration advantages are much lower than in earlier reported studies.

This suggests strong potential for strategies that seek to support economic and population growth in 'second order' Australian cities by focussing on particular local or regional strengths.

4. Housing and lifestyle implications of agglomeration

- **In this section we introduce the idea that agglomeration economies may widen inequalities through a number of mechanisms, and that this may undermine the 'social license' for planning around them.**
- **We find that productivity benefits from higher wages do not accrue to all, but are concentrated higher in the income distribution. Despite this, housing costs are pushed up across the income distribution.**
- **However, higher housing costs do not fully offset the gains from higher productivity.**
- **The provision of infrastructure, lifestyle and life-cycle factors are important in determining some households' decisions to move to regional areas.**
- **An analysis of regional, satellite and growth-city case studies suggests that there are important common characteristics in the success stories in city-regional economic development.**
- **Population projections, transportation, planning and infrastructure play an important role in setting funding and planning trajectories, but can undermine growth potential if they are unambitious.**

4.1 Agglomeration and the social license

Members of our Inquiry Panels raised the point that even if agglomeration effects apply to Australian cities and can be linked to increased productivity and higher wages, this does not automatically mean that there is a 'social license' to increase city scale. This highly pertinent point is reminiscent of Glaeser and Gottlieb's (2008) caution that, even if agglomeration effects are found to exist, this does not necessarily mean that public policy interventions should seek to move economic activities from one area to another. There is no guarantee that the gains from spatial areas receiving the redistribution of activities more than offset the losses of spatial areas that lose them. Another concern raised during Inquiry Panel discussions is that the benefits of agglomeration may not be uniformly or equitably distributed across the working population. That concern lies at the core of this Section.

In Section 4.1 we explore why there are reasons to suppose that such outcomes might occur. We then move on to examine the empirical evidence arising from research activities undertaken during the Inquiry. (This evidence largely arises from one of the four SRPs, but more recent evidence also emerges from AHURI's recently published suite of COVID-19–oriented research projects.) Finally, we consider the implications of the evidence on options for planning economic development in Australia's city-regions and regional cities.

It is important to recognise that home and neighbourhood are jointly purchased (or rented) in the housing market, and are at the core of household activity. Thus, the quality and variety of housing and the mix of households within a neighbourhood are important to the production of knowledge exchange and creativity. These endogeneities have been highlighted throughout the literature.

For example, the contexts of neighbourhood and home may be important to entrepreneurial behaviours. Glaeser (2010) notes the significance of residential clusters in developing ethnic businesses. Florida and King (2018) emphasise the importance of tolerant, bohemian neighbourhoods in attracting particular kinds of skilled groups and aged groups. High quality residential suburbs—and their social and sports amenities (urban amenities)—are fertile ground for social exchange relevant to business and professional cohorts.

In practice, there are many reasons why households may not be fully mobile across space, including:

- longer-term structural changes in the supply of affordable private rentals (Hulse, Reynolds et al. 2019)
- enduring patterns of social segregation that reproduce spatial inequalities and impede 'upward socio-spatial mobility' (Bailey and Minton 2018; Whelan and Parkinson 2017).

Thus home and neighbourhood are pertinent to the generation of agglomeration effects, just as spatial access to employment concentrations is important to outcomes in labour markets. For example, high-tech workers not only seek high-quality interactive neighbourhoods, they also have a predisposition to walk or cycle to work, so they are sensitive to all the key characteristics of housing choices on offer. This raises questions of mix and variety of housing in relation to core nodes of employment and their accessibility to different income and skills groups. Another obvious example relates to public sector workers. They may lag behind during wage and housing-price booms in expanding cities, and increasingly find homes displaced away from employment cores, such as the CBD.

This 'key worker' problem is a widespread manifestation of the misalignment of labour and housing market systems in contemporary metropolitan areas. The displacement of lower-income and middle-income households further into the suburbs may reduce lifetime earnings and productivity—primarily through the inability to capture knowledge-spillover benefits rather than transport cost savings. When workers are displaced away from employment cores, the solution is often seen as building new roads and transit systems. Insufficient attention is paid to how changes in housing mix and density closer to employment nodes might better resolve the issues for the long term (Maclennan, Crommelin et al. 2018).

Inquiry Panel members also highlighted that there is a complicated relationship between attracting people to an area (city, or regional area) and the provision of infrastructure. There are various dimensions to this problem. For example, infrastructure provision is costly and lumpy, but the benefits and boost to economic productivity—via a feedback loop to tax receipts—play out slowly and over the longer term. However, the empirical work reported by Gurran, Forsyth et al. (2021) emphasises the importance of various forms of infrastructure to promote the desirability and liveability of place. Specific examples put forward include educational institutions and health services, recreation, leisure and sports facilities:

> When people move to town, the first thing they do is they look at schools for their kids. Professionals, [it's] not so much the job that I'm going to. It's, 'What's the schooling like in that town?' (State Planning Agency Regional Manager)

> We've probably been a bit deficient in the building of—I'll call them community facilities which encompass quite a range of things—…so some of that organised recreation and sport, some of it's things like neighbourhood houses, community health centres, gathering places for groups and organisations, consolidating them into a limited number of places around the city. (Local Government Sustainability Manager)

Note: see Gurran, Forsyth et al. (2021) for more detail and full context.

Lifestyle factors include the presence and diversity of retail, dining and recreational venues, generally understood to be linked to growing demographic diversity, but also strongly linked to attracting a diverse workforce that includes professional and managerial occupations. The fieldwork reported in Gurran, Forsyth et al. (2021) suggests that amenities linked to lifestyle factors are important in explaining the population growth in some of the regional cases they reviewed. For example, some coastal areas have long attracted population for their lifestyle and amenity profiles, rather than for their economic or employment opportunities. Rapid growth dominated by retirees and other lifestyle-seekers, combined with second-home ownership and tourism demand, has led to infrastructure deficits and expensive housing in some cities:

> We had this constant game of trying to catch up with the infrastructure, trying to build infrastructure, trying to fund infrastructure, to meet our community needs. (Local Government Economic Development Officer)

Inquiry Panel discussions also emphasised the heightened and strengthening role of digital connectivity in rendering locations attractive to relocating population. This became even more important during the COVID-19 pandemic. Regional cities have always offered relatively more affordable housing than the major cities, and this was regarded by some participants in the Gurran, Forsyth et al. (2021) study to represent a comparative advantage. Recent improvements in connectivity and social infrastructure meant that some regional centres were being viewed as a viable option for working-age people moving out of capital cities, even prior to the COVID-19 pandemic:

> There's that young urban professional looking for lifestyle, or increasingly satisfied that there's a lifestyle on offer there that they perhaps didn't think was the case 15, 20 years ago. There's an affordability element that goes hand in hand with that. (State Planning Agency Regional Director)

> There is certainly a lifestyle factor that is an important part of why [this city] is an attractive place to live. Affordability aspects and amenities and ease of getting around the city; we're not impacted by congestion to the same extent … we get a number of enquiries for people that, through our economic development team, for people looking to move [here] for lifestyle factors and then look for a job rather than the other way around. (State Planning Agency Regional Director)

In considering the demographic characteristics of people likely to move to regional areas, it is important to acknowledge that retaining local populations of young adults may also be a long-term strategy for larger regional centres and satellite cities. Traditionally, younger school-leavers have left regional areas for education or employment opportunities in the major cities. Improving higher educational facilities and diversifying local economies will help to retain this important cohort—or attract them to return. Similarly, diversifying housing options available for young single professionals, who often seek smaller rental units, may also be an important consideration for regional towns and cities characterised by homogenous housing and limited rental markets. Efforts to counter negative perceptions about regional areas and the lifestyle and employment opportunities they provide was also seen by the expert actors in this study as an important strategy.

4.2 Housing and equality outcomes of agglomeration

This section addresses Inquiry research question 4:

> **How can the benefits of agglomeration economies be quantified in the Australian context? This includes evaluation of housing market effects, employment density, market potential, traffic congestion / commuting times / pollution and wellbeing, and differences between household types and/or socio-economic groups.**

The analysis is focussed particularly on the latter part of the question, as the main econometric evidence about the existence of agglomeration effects on productivity and their applicability to Australian cities was considered in Section 3. We focus particularly on the idea that agglomeration economies, having raised productivity (wages), may become eroded again, or offset through higher housing costs. In other words, we consider whether the potential gains of higher productivity are lost again by being capitalised—either fully or partially—into housing prices.

The evidence is provided by the Nygaard, Parkinson et al. (2021) SRP. Nygaard, Parkinson et al. undertook several re-estimations of their main econometric model to investigate whether agglomeration benefits on productivity (higher wages) persist after adjusting for housing costs. Their methodological approach is set out in their technical appendix but, briefly, they assume that each household in the HILDA dataset (Wave 17 and Wave 18) shares its observed annualised housing costs across all 'income units' in that household. Observed labour-market incomes are then adjusted down accordingly, to be expressed as net of housing cost measures. Of course, this presumes that all income units contribute to housing costs in proportion to their income—an assumption that may not hold in all cases.

Box 3: Income units

1 single adult with an earned income = 1 income unit
1 couple with joint earned income = 1 income unit
1 single adult with an adult child, each with an earned income = 2 income units
1 couple with joint income and 2 adult children, each with earned income = 3 income units

Source: Nygaard, Parkinson et al (2021).

Nygaard, Parkinson et al. (2021), on re-estimating their wage equation, found that employment density continues to exert a positive and statistically significant effect on wages even after adjusting for observed housing costs, equivalised in the manner noted in Box 3. For the SA2 spatial level they found that estimates fell by 20 per cent but remained significant. They found that the SA4 estimates remained broadly in line with the initial estimations. From this, they conclude that there appear to be wage benefits arising from agglomeration that are resilient to housing costs—that is, the benefits persist even after accounting for the potential for higher wages to be capitalised into housing costs (prices or rents).

However, additional insights provided through a quantile regression approach to their model re-estimation suggest that the potential benefits to wages through agglomeration, after adjusting for housing costs, are not equal across the income distribution.

Quantile regression allows the estimation of effects disaggregating by quantile—each separately observed 10 per cent of the sample or population. The results presented by the Nygaard, Parkinson et al. (2021) SRP provide some evidence that the lowest income decile derives little or no benefit from agglomeration. Higher deciles do benefit, even after accounting for housing costs, with the coefficient of employment density on real wages gradually rising, from 0.010 for the 2nd decile to 0.016 for the 8th and 9th deciles. These results tend to suggest that the benefits of agglomeration on the wage level disproportionately benefit higher-income groups. When examining the impact of employment density on wages adjusted for housing costs where individuals live—rather than where they work—the distributional impacts become starker, with the lowest 30 per cent of the sample not retaining the urban wage premium. Notably, this effect may also be generated by preferences for urban living, which is a factor the analysis is not able to separately control for.

4.3 Impacts of the COVID-19 pandemic on housing outcomes

There can be no question that the COVID-19 pandemic affected the perceptions and contributions of key actors and other participants in the SRPs in a number of ways. For example, the interviews carried out during the Gurran, Forsyth et al. (2021) study were conducted early in the COVID-19 pandemic, during the initial shutdown in 2020, which affected all Australian states. Participants were almost universally working from home in regional cities at the time. Many commented that they felt well prepared for remote working, although they and their employing agencies were all deeply involved in assisting the public and employers to understand and develop COVID-safe practices at the local level.

While the topics and question prompts for the interviews did not mention the pandemic, its long-term implications for regional cities were often spontaneously raised by interviewees. Perhaps predictably, a number of participants saw the current circumstances as presenting a positive opportunity for regional cities, as urban dwellers and their employers begin to understand the possibilities for remote working—or even just more flexible working—in many fields. However, it is by no means clear whether changes to working practices and commuting experienced during the fieldwork are temporary or permanent, or whether some hybrid or compromise may emerge in the longer term. Reiterating a point made earlier, some participants suggested that the sustainability of remote working is conditional on improvements in digital infrastructure. Others suggested that improving the digital infrastructure of regional cities is likely to support the development of industries such as data centres, back offices and tele-services, as well as specialist manufacturing opportunities—including medical or protective equipment.

4.4 Cities, city-regions and productivity

Gurran, Forsyth et al. (2021) selected 21 case studies comprising satellite cities, regional centres and growth centres, each with a population between 80,000 and 250,000, and with annual population growth rates of 1 per cent or more. Together, ongoing growth in these centres would represent a significant proportion of overall population in Australia.

Gurran, Forsyth et al. (2021) found some common themes in terms of comparative locational advantages. All were seen to have benefited either from their proximity to a larger state capital city or from being situated at an important transport and logistics interchange.

All of the case studies fulfilled important regional service roles as administrative headquarters for local services and sometimes state services, as well as health, education, commercial and retail services. With few exceptions, beyond their regional servicing roles, the economic mainstays of most regional cities were found to have been strongly linked to primary production in their regional hinterlands, mainly comprising transport and logistics (including port facilities) and processing of agricultural products.

At the same time, these sectors no longer figured as major employers and were seen in some cases to have a limited future because of new technology or climate change (or both). Consequently, all of the case-study cities were pursuing economic diversification. Most of the regional cities had substantial employment in healthcare and social assistance, followed by either retail or education. However, there is evidence from this SRP that employment in these sectors does not add a great deal to economic sustainability. Economic development leading to growth in managerial and professional positions was seen as essential to establish a diverse and sustainable economy.

Many of the case-study cities had recently established new industrial or business parks, often targeted at specific industry sectors, such as advanced manufacturing, aerospace and new energy technologies. These zones attempt to provide specific forms of infrastructure designed to facilitate investment from established and emerging industry leaders. While the facilities are intended to be commercially viable, they often require considerable front-loaded investment, which in turn requires participation by partners in other levels of government, usually state governments. However, some of the participant views reported in this SRP emphasise that such initiatives would struggle to attract new industries without significant improvements in large-scale infrastructure, such as high-speed broadband internet, which could only be provided at a national level.

Most of the cities studied host a university campus, with this generally being seen as a positive contribution to economic diversity, population retention and attraction, and cultural identity. All but one of the case-study regions were seen to have benefited from regional university campuses as catalysts for growth. Four of the case studies were identified to have benefited from new or upgraded investment in railway infrastructure (Ballarat, Bendigo, Geelong and Mandurah).

A situation in which multiple centres and towns operate as a regional network was found to offer strategic efficiencies through sharing of resources and infrastructure, but the report notes that intra-city competitiveness can hamper strategic decision-making. This may suggest that funding interventions and arrangements need to support greater regional network cooperation rather than competitiveness. It was noted that almost all of the cities studied participate in some form of regional partnership organisation involving contiguous local government bodies and, in some cases, regional industry organisations and government service agencies.

Commuting was put forward as an important factor for growth in satellite cities and regional centres, along with the role of transport infrastructure in permitting this. Commuting does not simply involve regional residents moving to capital city workplaces, but also (to an extent) managerial staff travelling in the opposite direction and particularly within regional centres and satellite cities, which are often poorly served by internal transport networks. Perhaps for this reason, commutability has been argued to be a mixed blessing. Improving transport connectivity between regional cities and capital cities can make them more desirable places to live, but can push up the price of housing without necessarily attracting jobs.

The Gurran, Forsyth et al. (2021) SRP also found evidence of circularity in processes of growth projections or targets, infrastructure investment and growth potential. Specifically, projections were seen as mainly extrapolation based, without reference to local context, but forming the basis of plan, funding and investment. Underestimates were seen to undermine population growth potential.

The study also found strong linkages between infrastructure funding, transport connectivity and population growth. For example, faster rail links in cities closer to metropolitan areas were credited by some of their participants for expanding labour markets and enhancing business networks. Several of the cities they studied had benefited from major improvements in airport infrastructure and air services in recent years. Some faster-growing regional cities reported having to focus for the first time on intra-city transport planning and infrastructure as a key element of managing growth.

5. Policy development options

5.1 Summary of the research findings

It is important to reflect on this premise: even if agglomeration economies do deliver higher productivity and hence higher wages, this does not automatically presume that public policy decisions should necessarily seek to move people or jobs (or both) from one place to another.

There is no prior theoretical reason or empirical evidence to support the idea that gains from agglomeration fully offset—or more than offset—economic losses made elsewhere when economic activity is *moved* through intervention. But policy decisions about the location of *new* economic activity are another matter. The numerous strands of literature review and econometric modelling in this Inquiry generate strong support for the notion that city scale delivers agglomeration benefits—whether through population size or employment density. Overall, the conclusion is that stronger economic outcomes are possible for Australia by harnessing spatial planning and urban / regional policies that promote the growth of cities. This applies particularly where there are strong connections between cities.

The evidence from this Inquiry shows the following:

- Analysis of successful regional, satellite and growth-centre cities reveals that there are some common characteristics. These include historic connections to primary industries; recent restructuring of economies; and diversification into health and social care, retail and education. Other important factors are economic development initiatives targeting technology sectors and the influence of university campus operations.
- Population projections and transportation planning and infrastructure play an important role in forming funding and planning trajectories, but unambitious approaches are seen to undermine the potential for growth in regional and satellite centres.
- There are strong lifestyle and life-cycle effects that help explain why people move—particularly to regional cities and areas—and the COVID-19 pandemic is seen to have accelerated this trend.
- There are important interactions between urban amenities (widely defined), the relocation decisions of more productive workers, and economic outcomes. In other words, business start-ups, entrepreneurial activity and the migration of higher productivity workers are endogenous processes.
- While agglomeration benefits in the form of higher wages do apply to Australian cities, they are not fully offset by higher housing costs, and the benefits apply disproportionately to higher-income groups. Despite this, the impact on housing costs is experienced across the entire income distribution. This means that agglomeration economies play a role in widening inequalities.
- There are interactions between the provision of infrastructure and household-move decisions, particularly in relation to the perceived importance of lifestyle factors influencing move decisions. However, infrastructure investment is lumpy and needs to take place in advance of promoting locations for population growth.

5.2 Policy implications

As noted at the beginning and throughout this Inquiry Final Report, the research reported here and in four SRP reports was designed and commissioned before the COVID-19 pandemic. The pandemic changes much of the policy context, but there remains a core set of policy issues and options that remain relevant. Indeed, the relevance of making policy choices about the direction of future migration policy and the destinations of those future migrants is arguably heightened further by the pandemic and its aftermath.

At the time of writing, the COVID-19 pandemic was not yet over, and there was considerable doubt and uncertainty about the possible future pathways. For example, recent emergence of mutated Coronavirus strains coupled with fears of increased infectiousness and resistance to vaccines were still playing out, with the result that there could be no guarantee of an imminent end to the pandemic.

Setting this aside, Australia during 2020 and at least the first half of 2021 was a country in which NOM had almost halted, but one that was seeing significant volumes of Australian citizens and residents returning from overseas travel and work assignments. The pressures on the housing market were acute, aided by several policy interventions designed to stimulate the domestic economy.

Assuming that NOM resumes at some point in the foreseeable future, we suggest that there are several important policy priorities to accommodate resumed population growth.

- First, we note both that productivity gains arise at relatively small (100,000 population) city scale and become stronger with city size and density. Policy should emphasise investment in major infrastructure for regional areas and cities (and satellite cities) that have already been identified as locations of population and economic growth.
- Second, reflecting that regional and satellite cities perform best when integrated in highly connected networks, we encourage increased support for transport connectivity between major and regional / satellite cities—but we also emphasise that these policies must be offset by other policies designed to maintain or improve housing affordability.
- Third, there is a clear connection between economic diversification and further economic growth—particularly economic development aligned to knowledge-industry activities. These opportunities are not heavily location-dependent. We encourage targeted support designed to capitalise on these growth opportunities.
- Fourth, we note from the research evidence and the expert advice from the members of our Inquiry Panel that from a policy perspective it is generally much easier to move people than to move jobs. We also note the strong role that tenure and housing affordability play in both facilitating and impeding labour-market mobility in Australia. We therefore advise policy options that expand affordable rental supply in Australia's inner urban areas, and the development of diverse and affordable rental housing in regional areas in order to support mobility of lower-income workers.

5.3 Future directions

The research summarised in this report suggests that there are many options in planning for population change and migration in Australia. However, an Inquiry of the scale reported in this Final Report, together with its complexity, inevitably throws up additional unanswered questions that may call for future research activities. In the case of this Inquiry, the research method was designed and much of the work undertaken prior to and during the COVID-19 pandemic. This complicates the interpretation of the results and increases the need for further research activities.

As discussed in Section 1.4, COVID-19 has important implications for understanding how agglomeration economies and issues of city scale, density and connectivity will evolve in the future. At the time of writing it was not necessarily a given that the COVID-19 pandemic will end. Other scenarios are possible, including a transition to an environment in which the virus has become resident, ensuring an ongoing need for altered social, working and public health arrangements. If the pandemic does end in a more definitive way, there remain questions about whether shifts in household preferences for regional / rural location rather than urban location, working from home, reduced

commuting and reduced demand for city-centre office space are permanent or transitory, or will revert to some hybrid pattern. There are obviously implications for the role played by agglomeration economies—and for spatial planning, urban and transportation policies—that lie outside the scope of this research. In closing, we suggest that the following research questions would be fruitful avenues for further investigation:

- What are the NOM scenarios moving beyond 2021? Realistically, when will significant flows of migrants return to Australia, and what are the implications for economic development and planning?
- What are the longer-term implications of large-scale flows of returning Australians on labour markets, housing markets and costs, and the economy? And to what extent do the socio-economic, demographic and household wealth characteristics of such households matter in terms of impacts to the Australian housing system?
- Will the pandemic patterns of large-scale returning Australians revert to pre-pandemic patterns? Will this entail significant movement of Australians to work overseas again, and what are the implications on housing markets?
- Are the regional housing market trends, and trends of decentralisation within cities, temporary phenomena triggered by the pandemic, or are they likely to persist for longer? What are the implications for housing markets and costs, and for job creation?
- How will patterns of commuting, interstate migration, labour mobility and teleworking change after the pandemic ends? Are there particular implications for regional or outer-urban suburban housing markets? Will patterns revert to previous patterns, or exhibit a permanent change?
- Will the demand for city-centre office space recover to pre-pandemic levels, or will the shift to reduced office space and more teleworking become permanent? How will this actually affect agglomeration effects? There are arguments that they will become less important (fewer face-to-face interactions), and more important (more firms can occupy a city centre if they consume small volumes of space due to home working).
- To what extent does the provision of infrastructure, including digital connectivity, facilitate effective spatial movement of jobs in addition to—or rather than—people?

References

Ahlfeldt, G. M. and Pietrostefani, E. (2019) 'The economic effects of density: a synthesis', *Journal of Urban Economics*, vol. 111: 93–107.

Ahrend, R., Lembcke, A. and Schuman, A. (2017) 'The role of urban agglomerations for economic and productivity growth', *International Productivity Monitor*, Centre for the Study of Living Standards, vol. 32, Spring: 161–179.

Australian Government Department of the Prime Minister and Cabinet (AGDPMC) (2019) *Planning for Australia's future population*, Australian Government, Canberra.

Australian Bureau of Statistics (2011) *Australian statistical geography standard (ASGS): Volume 1–Main structure and greater capital city statistical areas*, cat.1270.0.55.001, ABS, Canberra.

Australian Bureau of Statistics (2013) *Population projections, 2012 to 2101*, cat. no. 3222.0, ABS, Canberra.

Australian Bureau of Statistics (2018) *Census of population and housing: socio-economic indexes for areas (SEIFA), Australia, 2016*, cat. 2033.0.55.001, ABS, Canberra.

Australian Bureau of Statistics (2019) *Australian demographic statistics*, December 2018, cat. no. 3101.0, ABS, Canberra.

ABS (2021) Regional Internal Migration Estimates, provisional, Sep. 2020. Canberra, Australian Bureau of Statistics.

Bailey, N. and Minton, J. (2018) 'The suburbanisation of poverty in British cities, 2004–16: extent, processes and nature', *Urban Geography*, vol. 39, no. 6: 892–915.

Baker, E., Bentley, R., Lester, L. and Beer, A. (2016) 'Housing affordability and residential mobility as drivers of locational inequality' *Applied Geography*, vol. 72: 65–75.

Baldwin, J. R., Beckstead, D., Brown, W. M. and Rigby, D.L. (2007) 'Urban economics and productivity', *Economic Analysis Research Paper Series* No. 45, Statistics Canada.

Balliester, T. and Elsheikhi, A. (2018) *The future of work: a literature review*, Research Department Working Paper No. 29, International Labour Organization, United Nations, https://www.ilo.org/global/research/publications/working-papers/WCMS_625866/lang--en/index.htm.

Belzunegui-Eraso, A. and Erro-Garcés, A. (2020) 'A teleworking in the context of the Covid-19 crisis' *Sustainability*, vol. 12: 3662, doi:10.3390/su12093662.

Bowie, D. (2013) 'Report of the second seminar of the RSA Research Network on governing metropolitan regions within a localist agenda', *Regions Magazine*, vol. 291, no. 1: 28–29, doi: 10.1080/13673882.2013.10739983.

Brülhart, M. and Mathys, N. A. (2008) 'Sectoral agglomeration economies in a panel of European regions', *Regional Science and Urban Economics*, vol. 38, no. 4: 348–362.

Campbell, S. and Withers, H. (2017) *Australian productivity trends and the effect of structural change,* Economic Roundup, Australian Government Treasury, Canberra: https://treasury.gov.au/publication/p2017-t213722c.

Carlino, G. A., Chatterjee, S. and Hunt, R. M. (2007) 'Urban density and the rate of invention', *Journal of Urban Economics*, vol. 61, 389–419.

Centre for Population (2020) *Population statement*, Australian Government, Canberra, https://population.gov.au/publications/publications-population-statement.html.

Centre for Population (2021) *Migration between cities and regions: a quick guide to COVID-19 impacts*, Australian Government, Canberra, https://population.gov.au/docs/the-impacts-of-covid-on-migration-between-cities-and-regions.pdf.

Charles-Edwards, E., Wilson, T., Bernard, A. and Wohland, P. (2021) How will COVID-19 impact Australia's future population? A scenario approach, *Applied Geography*, Vol. 134, https://doi.org/10.1016/j.apgeog.2021.102506.

Chatterji, A., Glaeser, E. L. and Kerr, W. R. (2013) *Clusters of entrepreneurship and innovation*, NBER working paper series 19013, National Bureau of Economic Research, Cambridge, MA.

Ciccone, A. and Hall, R. (1996) 'Productivity and the density of economic activity', *American Economic Review*, vol. 86, no. 1: 54–70.

Clark, W. A. V. (2017) 'Residential mobility in context: interpreting behavior in the housing market', *Papers: Revista de Sociologia*, vol. 102, no. 4: 575–605.

Clark, W. A. V. and Coulter, R. (2015) 'Who wants to move? The role of neighbourhood change', *Environment and Planning A: Economy and Space*, vol. 47, no.12: 2683–2709.

Clark, W. A. V. and Lisowski, W. (2017) 'Decisions to move and decisions to stay: life course events and mobility outcomes', *Housing Studies*, vol. 32, no. 5: 547–565.

Clark, W. A. V. and Lisowski, W. (2018) 'Examining the life course sequence of intending to move and moving', *Population, Space and Place*, vol. 24, no. 3: e2100.

Clark, W. A. V. and Maas, R. (2015) 'Interpreting migration through the prism of reasons for moves', *Population, Space and Place*, vol. 21, no.1: 54–67.

Clark, W. A. V., Duque-Calvache, R. and Palomares-Linares, I. (2017) 'Place attachment and the decision to stay in the neighbourhood', *Population, Space and Place,* vol. 23, no. 2: e2001.

Combes, P. P. and Gobillon, L. (2014) *The empirics of agglomeration economies*, IZA discussion paper 8508, Institute for the Study of Labor, Bonn.

Conisbee, N. (2020, 24 June) 'The state of the regional property market', RealEstate.com, Regional Australia Institute Webinar.

Coulson, N. E. and Fisher, L. M. (2009) 'Housing tenure and labor market impacts: the search goes on', *Journal of Urban Economics*, vol. 65, no. 3: 252–264.

Coulton, C., Theodos, B. and Turner, M. A. (2012) 'Residential mobility and neighborhood change: real neighborhoods under the microscope', *Cityscape* , vol. 14, no. 3: 55–89.

Cresswell, T., Dorow, S. and Roseman, S. (2016) 'Putting mobility theory to work: conceptualizing employment-related geographical mobility', *Environment and Planning A: Economy and Space*, vol. 48, no. 9: 1787–1803.

Crescenzi, R., Holman, N. and Orru, E. (2017) 'Why do they return? Beyond the economic drivers of graduate return migration', *The Annals of Regional Science*, vol. 59, no. 3: 603–627.

Davies, A. (2008) 'Declining youth in-migration in rural Western Australia: the role of perceptions of rural employment and lifestyle opportunities', *Geographical Research*, vol. 46, no. 2: 162–171.

Davies, A. and James, A. (2011) *Geographies of Ageing: Social Processes and the Spatial Unevenness of Population Ageing*, Farnham, Ashgate.

Desmond, M., Gershenson, C. and Kiviat, B. (2015) 'Forced relocation and residential instability among urban renters', *Social Service Review*, vol. 89, no. 2: 227–262.

Dodson, J., de Silva, A., Dalton, T. and Sinclair, S. (2017) *Housing, multi-level governance and economic productivity*, AHURI Final Report No. 284, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/284, doi:10.18408/ahuri-5307501.

Duque-Calvache, R., Clark, W. and Palomares-Linares, I. (2018) 'How do neighbourhood perceptions interact with moving desires and intentions?', *Housing Studies*, vol. 33, no. 4: 589–612.

Duranton, G. and Puga, D. (2000) 'Diversity and specialisation in cities: why, where and when does it matter?', *Urban Studies*, vol. 37, no. 3: 533–555.

Duranton, G. and Puga, D. (2004) 'Micro-foundations of urban agglomeration economies', in J. V. Henderson and J. F. Thisse (eds), *Handbook of Regional and Urban Economics*, vol. 4, Elsevier, Amsterdam: 2063–2117.

Duranton, G. and Puga, D. (2020) 'The economics of urban density', *Journal of Economic Perspectives*, vol. 34, no. 3: 3–26.

Dustmann, C. and Frattini, T. (2014) 'The fiscal effects of immigration to the UK', *The Economic Journal*, vol. 124, no. 580: 593–643.

Ferreira, F., Gyourko, J. and Tracy, J. (2010) 'Housing busts and household mobility', *Journal of Urban Economics*, vol. 68, no. 1: 34–45.

Fingleton, B. (2008) 'Housing supply, housing demand and affordability', *Urban Studies*, vol. 45, no. 8: 1545–1563.

Florida, R. and King, K. M. (2018) 'Urban start-up districts: mapping venture capital and start-up activity across ZIP codes', *Economic Development Quarterly*, vol. 32, no. 2: 99–118.

Foster, N. and Stehrer, R. (2009) 'Sectoral productivity, density and agglomeration in the Wider Europe', *Spatial Economic Analysis*, vol. 4, no. 4, 1742–1772.

Glaeser, E. (2010) *Agglomeration Economics*, Chicago: University of Chicago Press.

Glaeser, E. and Gottlieb, J. (2009) 'The wealth of cities: agglomeration economies and spatial equilibrium in the United States', *Journal of Economic Literature*, vol. 47, no. 4: 983–1028.

Glaeser, E. and Gyourko, J. (2018) 'The economic implications of housing supply', *Journal of Economic Perspectives*, vol. 32, no. 1: 3–30.

Gurran, N., Forsyth, A., Darcy, M., Searle, G., Buckle, C. and Zou, S. (2021) *Population growth, regional connectivity, and city planning—international lessons for Australian practice*, AHURI Final Report No. 362, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/362, doi:10.18408/ahuri7322301.

Gurran, N., Phibbs, P., Yates, J., Gilbert, C., Whitehead, C., Norris, M., McClure, K., Berry, M., Maginn, P., Goodman, R. (2015) *Housing markets, economic productivity, and risk: international evidence and policy implications for Australia–Volume 1: Outcomes of an Investigative Panel*, AHURI Final Report No. 254, Australian Housing and Urban Research Institute Limited, Melbourne. https://www.ahuri.edu.au/sites/default/files/migration/documents/AHURI_Final_Report_No254_Housing_markets_economic_productivity_and_risk_international_evidence_and_policy_implications_for_Australia-Volume_1.pdf.

Haslam McKenzie, F. (2016) *Labour Force Mobility in the Australian Resources Industry: Socio-Economic and Regional Impacts*, Springer, Singapore.

Horne, D. (1964) *The Lucky Country: Australia in the Sixties*, Penguin Books, Ringwood, Victoria.

Hsieh, C. T. and Moretti, E. (2019) 'Housing constraints and spatial misallocation', *American Economic Journal*: *Macroeconomics*, vol. 11, no. 2 1–39.

Hulse, K., Reynolds, M., Nygaard, C., Parkinson, S. and Yates, J. (2019) *The supply of affordable private rental housing in Australian cities: short-term and longer-term changes*, AHURI Final Report No. 323, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/323, doi:10.18408/ahuri-5120101.

Hulse, K., Reynolds, M., Stone, W. and Yates, J. (2015) *Supply shortages and affordability outcomes in the private rental sector: short- and longer-term trends*, AHURI Final Report No. 241, Australian Housing and Urban Research Institute, Melbourne, https://www.ahuri.edu.au/sites/default/files/migration/documents/AHURI_Final_Report_No241_Supply-shortages-and-affordability-outcomes-in-the-private-rental-sector-short-and-longer-term-trends.pdf, ISBN: 978-1-922075-91-8.

Infrastructure Australia (2018) *Future cities: planning for our growing population*, Infrastructure Australia, Sydney.

James, A., Rowley, S., Davies, A., Ong, R. and Singh, R. (2021) *Population growth and mobility in Australia: implications for housing and urban development policies*. AHURI Final Report 365, Australian Housing and Urban Research Institute Limited, Melbourne, URL, doi: 10.18408/ahuri8122101. https://www.ahuri.edu.au/sites/default/files/documents/2021-10/AHURI-Final-Report-365-Population-growth-and-mobility-in-Australia.pdf.

James, A., Rowley, S., Stone, W., Parkinson, S. Spinney, A. and Reynolds, M. (2019) *Older Australians and the housing aspirations gap*, AHURI Final Report No. 317, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/317, doi:10.18408/ahuri-8117301.

Johnson, L., Mundell, M. and Bartel, R. (2020) *Resilient Geelong: reasons for success and challenges for a post-COVID-19 future*, Committee for Geelong, Geelong.

Lee, E. S. (1966) 'A theory of migration', *Demography*, vol. 3, no. 1: 47–57.

Leishman, C., Bond-Smith, S., Liang, W., Long, J., Maclennan, D. and Rowley, S. (2021) *Relationships between metropolitan, satellite and regional city size, spatial context and economic productivity*, AHURI Final Report No. 357, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/357, doi:10.18408/ahuri31222.

Maclennan, D., Crommelin, L., van den Nouwelant, R. and Randolph, B. (2018) *Making better economic cases for housing polices: report to the New South Wales Federation of Housing Associations*, http://gsc-public-1.s3.amazonaws.com/s3fs-public/making_better_economic_cases_for_housing_policies_-_unsw_-_march_2018.pdf.

Maclennan, D., Ong, R. and Wood, G. (2015) *Making connections: housing, productivity and economic development*, AHURI Final Report No. 251, Australian Housing and Urban Research Institute, Melbourne, http://www.ahuri.edu.au/publications/projects/p53035.

Maclennan, D., Randolph, B., Crommelin, L., Witte, E., Klestov, P., Scealy, B. and Brown, S. (2019) *Strengthening economic cases for housing polices*, UNSW City Futures Research Centre, Sydney.

Marsh, A. and Gibb, K. (2011) 'Uncertainty, expectations and behavioural aspects of housing market choices', *Housing, Theory and Society*, vol. 28, no. 3: 215–235.

Marshall, A. (1920) *Principles of Economics* (8th ed.), Macmillan, London, UK. (Original work published 1890)

Mayes, R. (2020) 'Mobility, temporality, and social reproduction: everyday rhythms of the "FIFO family" in the Australian mining sector', *Gender, Place & Culture*, vol. 27, no. 1: 126–142.

McKenzie, F., Haslam McKenzie, F. and Hoath, A. (2014) 'Fly-in/fly-out, flexibility and the future: does becoming a regional FIFO source community present opportunity or burden?', *Geographical Research*, vol. 52, no. 4: 430–441.

Melo, P. C., Graham, D. J. and Noland, R. B. (2009) 'A meta-analysis of estimates of urban agglomeration economies', *Regional Science and Urban Economics*, vol. 39, no. 3: 332–342.

Molloy, R., Smith, C. L. and Wozniak A. (2017) 'Job changing and the decline in long-distance migration in the United States', *Demography*, vol. 54, no. 2: 631–653.

Morrison, P. S. and W. A. V. Clark (2016) 'Loss aversion and duration of residence', *Demographic Research*, vol. 35: 1079–1100.

National Housing Finance and Investment Corporation (2020) *State of the nation's housing 2020*, NHFIC, Sydney.

NSW Department of Planning Industry and Environment (2020) *Infrastructure funding policies*, https://www.planning.nsw.gov.au/Policy-and-Legislation/Infrastructure/Infrastructure-Funding.

Nygaard, C., Parkinson, S. and Reynolds, M. (2021) *Agglomeration effects and housing market dynamics*, AHURI Final Report 366, Australian Housing and Urban Research Institute Limited, Melbourne, URL, doi: 10.18408/ahuri5122401. https://www.ahuri.edu.au/sites/default/files/documents/2021-10/AHURI-Final-Report-366-Agglomeration-effects-and-housing-market-dynamics.pdf.

Ong, R., Wood, G., Whelan, S., Cigdem, M., Atalay, K. and Dodson, J. (2017) *Inquiry into housing policies, labour force participation and economic growth*, AHURI Final Report No. 285, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/285, doi:10.18408/ahuri-8107001.

Oswald, A. J. (1996) *A conjecture on the explanation for high unemployment in the industrialized nations: part 1*, University of Warwick Economic Research Paper No. 475.

Pill, M., Gurran, N., Gilbert, C. and Phibbs, P. (2020) *Strategic planning, 'city deals' and affordable housing*, AHURI Final Report No. 331, Australian Housing and Urban Research Institute Limited, Melbourne, http://www.ahuri.edu.au/research/final-reports/331, doi: 10.18408/ahuri-7320301.

Productivity Commission (2014) *Geographic labour mobility research report*, Australian Government, Canberra.

Rawnsley, T. and Szafraneic, J. (2010) *Agglomeration and labour productivity in Australian cities*, SGS Economics and Planning, Melbourne.

Real Insurance (2021) *The Real Home Shift*, available: https://www.realinsurance.com.au/news-views/the-real-home-shift.

Rosenthal, S. S. and Strange, W. C. (2003) 'Geography, industrial organization, and agglomeration', *The Review of Economics and Statistics*, vol. 85, no. 2: 377–393.

Rosenthal, S. and Strange, W. (2004) 'Evidence on the nature and sources of agglomeration economies', in J. V. Henderson, and J. F. Thisse (eds), *Handbook of Urban and Regional Economics*, vol. 4, Elsevier, Amsterdam.

Rosenthal, S. S. and Strange, W. C. (2008) 'The attenuation of human capital spillovers', *Journal of Urban Economics*, vol. 64: 373–389.

Ross, H. (2020, 10 May) 'Post-COVID-19 wave of regional migration predicted as people seek simpler life, get back to basics', *ABC News Online*, https://www.abc.net.au/news/2020-05-10/post-covid-19-pandemic-simpler-life-migration/12229082.

Rossi, P. H. (1955) *Why Families Move: A Study in the Social Psychology of Urban Residential Mobility*, Free Press, Glencoe, Illinois.

Rowley, S. and James, A. (2018) *The private rental sector: public perceptions of quality and affordability*, BCEC Research Report 18/18, Bankwest Curtin Economics Centre, Perth.

Rowley, S., Crowe, A. Gilbert, C., Kruger, M., Leishman, C. and Zuo, J. (2020) *Responding to the pandemic, can building homes rebuild Australia?*, AHURI Final Report No. 341, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/341, doi:10.18408/ahuri8126401.

Speare, A. (1974) 'Residential satisfaction as an intervening variable in residential mobility', *Demography*, vol. 11, no. 2: 173–188.

Standing Committee on Infrastructure, Transport and Cities (SCITC) (2018) *Building up & moving out: inquiry into the Australian Government's role in the development of cities*, Commonwealth of Australia: Canberra.

Statistics Canada (2019) Census Profile, 2016 Census, available: https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E.

Trubka, R. (2011) *Agglomeration economies in Australian cities: productivity benefits of increasing urban density and accessibility*, PhD thesis, Curtin University, Perth.

van den Nouwelant, R., Crommelin, L., Herath, S. and Randolph, B. (2016) *Housing affordability, central city economic productivity and the lower income labour market*, AHURI Final Report No. 261, Australian Housing and Urban Research Institute Limited, Melbourne, https://www.ahuri.edu.au/research/final-reports/261, ISBN 978-1-925334-23-4.

Wheeler, C. H. (2001) 'Search, sorting and urban agglomeration', *Journal of Labor Economics*, vol. 19, no. 4: 879–899.

Whelan, S. and Parkinson, S. (2017) *Housing tenure, mobility and labour market behaviour*, AHURI Final Report No. 280, Australian Housing and Urban Research Institute Limited. Melbourne, https://www.ahuri.edu.au/research/final-reports/280, doi:10.18408/ahuri-7307101.

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