

EXECUTIVE SUMMARY

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Relationships between metropolitan, satellite and regional city size, spatial context and economic productivity

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

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Inquiry into population growth, migration and agglomeration

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Qualifying statement

The research referred to in this final report was designed and commissioned before the onset of the COVID-19 pandemic. Datasets were collected prior to the pandemic, and the quantitative work largely completed around the middle of 2020. This report is part of the Inquiry into population growth, migration and agglomeration - other reports from the Inquiry consider the impacts of COVID-19.

Executive summary

Key points

- Based on international evidence, there is a *prima facie* case that the economic productivity gains arising from city scale are being eroded by negative factors, including congestion and adverse housing outcomes—such as unaffordability.
- International and internal migrants have begun to disperse from metropolitan areas and migrate directly to new smaller areas, particularly in North America and Europe. The major metropolitan areas are losing the largest share of net domestic migrants, while domestic migration is accelerating suburbanisation within metropolitan areas.
- Empirical results suggest that, for US cities, a city of 1 million people would imply a wage rate 7.6 per cent higher than a city of 500,000 population.
- For Australian cities, the evidence of a productivity gain from higher city scale is weaker, and the estimates are smaller than for US cities. The results are inconclusive, probably reflecting the short time series of data available to the project, but there are indications that agglomeration economies might appear at smaller city scales in Australia compared to the USA and the EU.
- Population is positively associated with higher wage rates in Australian cities. There are also positive impacts on the number of businesses and total jobs. The results suggest that having larger cities could therefore yield a productivity dividend.

- **Industrial agglomeration, or increased industry employment shares, is also positively linked to incomes and the number of businesses in Australian cities—particularly for employment in those economic sectors that are already associated with high employment shares.**
- **The relationships between city size and economic productivity are complex and nonlinear. There are suggestions that improvements to productivity are greater at lower levels of city population, but tail off as population grows.**

Key findings

The research questions addressed by this study are:

- **RQ1:** At what city scales do agglomeration economies (and diseconomies) arise? And how does this vary over time, by Australian geography and by international context?
- **RQ2:** What are the relative importances of accessibility, housing and commercial real estate user costs, population density, environmental factors, skills, interstate and international migration to growth in jobs, businesses and city-scale economic output?
- **RQ3:** What does the international evidence base suggest about the relationship between international migration, housing costs and economic output?

The research combined a number of research approaches, including:

- a review of international literature, evidence and statistics
- econometric analysis of US, EU and Australian data on the economic performance of cities.

The international review revealed a number of insights that are relevant to housing and urban policy in the Australian context. For example, we found that there appears to be broad support for the notion that housing outcomes—including affordability and congestion caused by commuting—may be beginning to erode the potential economic productivity gains that arise through city scale. There are also knock-on impacts within the urban economy, including impacts on the composition and skill levels and mix of labour markets. There are also other complex interactions at work because there is evidence, internationally and from Australia, that patterns of migration are changing. These interactions suggest that the relative desirability of metropolitan, smaller cities and regional markets are changing for international migrants, and for migrants within countries.

The econometric analyses showed that agglomeration economies—or the combined benefits of a range of advantages arising from city scale and concentration—appear at all levels of population within a range of city sizes examined in the US and Australian data. Estimated threshold effects do not imply any diseconomies of scale over the range of city sizes and, if anything, that agglomeration economies strengthen in the larger cities, rather than weaken. The positive coefficients for cities below the lowest thresholds examined suggest that agglomeration economies occur even for very small cities.

A set of models based on US cities, which included interaction effects, suggested that agglomeration economies strengthen with city size. Although the results for Australia were often not statistically significant, the coefficients were consistent with the results for the USA. The weaker levels of statistical significance found for Australian cities probably reflects the shorter time series of data and the smaller number of cities in Australia rather than any systematic difference.

The European data did not indicate agglomeration economies or diseconomies, nor any pattern of strengthening or weakening. It may be that structural factors in Europe mean that agglomeration economies are less of a factor for predicting average city incomes in Europe. This could be due to 'borrowed size', industrial structure or migration.

The analysis of Australian data focusses only on the period 2011–16, which reflects the poor availability of time series data for cities. Our simple linear estimation results show that population is positively associated with higher wage rates, creation of businesses and total jobs. We also found that industry agglomeration—that is, increasing industry employment shares—is positively linked with income and business. In particular, increasing the employment shares from the five largest economic sectors—Health, Retail Trade, Construction, Manufacturing and Education—would in theory lead to a higher level of real wages. Meanwhile, population density seems to play a minor role in determining wage rates, but is an important determinant of business growth in Australia.

In a different set of nonlinear (parametric) estimations, we found that the positive relationship between population and income is conditional on city population levels. In other words, the effect of population on income is heterogenous, and only the cities with low population levels are positively related to income. A set of semiparametric estimations shows that the relationship between income and population is nonlinear. Overall, these results suggest that higher levels of population increase wage rates for smaller cities rather than much larger cities.

Policy development options

An important feature of local housing outcomes is that they reflect levels and interactions of factors:

- **local factors**—residential structures, neighbourhood qualities, physically limited developable land
- **metropolitan factors**—agglomeration economies and amenities
- **subnational influences.**

The policy approaches and instruments that are reflected in the choices of households and developers reflect a variety of instruments controlled from different levels of government. These measures are not always well coordinated—and some measures may even run counter to each other. Managing the metropolitan housing system requires a real grasp of policy impacts and interactions in achieving metropolitan goals.

The assignment of policy responsibilities and functions within a geographically large federal system such as Australia must take into account the functional nature of systems. With a strong local dimension to housing systems, it could be expected that state and metropolitan scales would have significant housing policy roles. However, housing outcomes from local actions may spillover into other jurisdictions, and across the nation as a whole. So it is important to have a federal view on good or desirable housing outcomes for Australians.

The Australian Government has previously reported that the contribution of major cities to national economic growth has declined over time. Our more recent results suggest that this decline may have continued. However, we also find evidence to suggest that smaller Australian cities stand to make a higher contribution to economic productivity, if permitted to scale up.

However, there are some key aspects of public policies for housing—apart from their framing—that need to change if the gap between achieved and potential metropolitan economic potential is to be reduced or removed. This involves rethinking the structures and settings for housing policies in major metropolitan areas, and so it will be essential:

- to manage the real housing system to facilitate faster supply responses
- to better connect housing and other areas of policy activity
- to deal with market failures
- to avoid demand stimuli that needlessly raise prices or underutilise existing residential spaces.

A first step will be to reconceive housing policies as being, in part, concerned with real economic infrastructure to facilitate economic development. A second step is to move away from a narrow focus on homelessness and the poorest households and to set their concerns within a broader housing-systems framework that considers all housing outcomes in metropolitan areas—and in the nation.

Two important policy changes are required to deal with ‘multi-order’ issues.

First, multi-order cooperation in housing policy needs to be incentivised. This may require federal/state/provincial governments to develop performance-conditional housing deals with metropolitan governments.

Second, key housing policy decisions increasingly rest at the metropolitan scale. Given their important role in national economic development, there is a strong case to refocus the leadership roles in housing policy strategy and delivery down from federal/state/provincial levels and up from municipal scales to metropolitan scales.

Metropolitan boundaries are rarely well aligned with daily functional system boundaries. Although around half of the metropolitan areas in the OECD have now evolved some form of metropolitan governance, fewer than one in six have any resource or fiscal powers. So, the best geographic and fiscal structures to take forward more effective metropolitan housing powers may currently be missing.

Similar remarks can be made in relation to the assignment of fiscal powers to different orders of government. In a functional metropolitan area, the problem is that costs—such as affordable housing, traffic congestion and green space requirements—all rise with economic growth, as do tax revenues. So while the problems remain in the functional city, the tax revenues required to address them accrue to other orders of government. There is no automatic flowback of locally generated resources to pressured localities so they can take action to reduce negative growth consequences.

Given the vast scale of the housing shortages current in all of Australia’s major growth localities, a serious attempt to reduce house price growth for the future might have to include radical options such as:

- compulsory purchase of land
- requirements for inclusionary zoning.

In other words, housing policy should be a key element in ‘place-making’ policy at both metropolitan and neighbourhood scales. This also requires that related infrastructure and services—as well as transport links to jobs and services—are built into the proposal beforehand (*ex ante*), and that infrastructure and planning gains are taken to the greatest extent possible by metropolitan governments.

The study

The research summarised in this Final Report forms part of a wider AHURI *Inquiry into population growth, migration and agglomeration*. This project focusses on two of the four overarching inquiry level research questions:

- **RQ2:** 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?
- **RQ4:** 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 emphasis in this report is on addressing RQ2, but the empirical findings give some insights into RQ4.

The AHURI inquiry is motivated by the fact that the goal of raising economic productivity is rising in importance nationally and internationally. There are many reasons for this, but this report focusses mainly on the relationship between city scale and productivity, and on interactions between housing outcomes and productivity outcomes.

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
- diseconomies associated with urban agglomeration—that is, the big cities have become too big (MacLennan, Crommelin et al. 2015; van den Nouwelant, Crommelin et al. 2016; Hulse, Reynolds et al. 2015).

Migration is also a hotly contested topic, particularly international migration. Many commentators argue that migration drives up housing costs and contributes to housing unaffordability, with a feedback effect 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 productivity impact argument is unclear at present, with relatively little empirical evidence to inform policy development.

In the past, AHURI funded a number of research projects examining linkages between housing and productivity, and so the evidence base is beginning to build up. However, agglomeration economies are inherently complex in terms of how they interact with city size, regional and spatial issues, and change over time, and may be subject to threshold and nonlinear effects. There are numerous econometric and identification issues to be overcome, and existing data sources are barely sufficient for the purpose. The empirical work shown in this report brings together data on US and EU cities, as well as Australian cities. We examine the relationships in these three broad geographic contexts to determine whether there are relationships affecting cities in general—irrespective of their location internationally—and whether there is evidence that such relationships also exist in Australia.

The overarching inquiry is 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’ is taken to mean the net aggregate impact of a range of internal and external economies, or advantages vs disadvantages, that accrue when firms and individuals 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.

This report is designed to contribute to the empirical evidence about the existence and scale of agglomeration economies, and the conditions under which they might exist and apply to Australian cities. As Glaeser and Gottlieb (2009) pointed out, agglomeration economies are difficult to estimate, and may be subject to nonlinear and threshold effects. The case for making policy interventions in an attempt to realise agglomeration economy dividends is far from having been made empirically. Thus, this project makes an important contribution to the evidence base to be considered by the overarching inquiry.



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