Australian Government
Centre for Population

ANTICIPATING THE IMPACT OF COVID-19 ON INTERNAL MIGRATION

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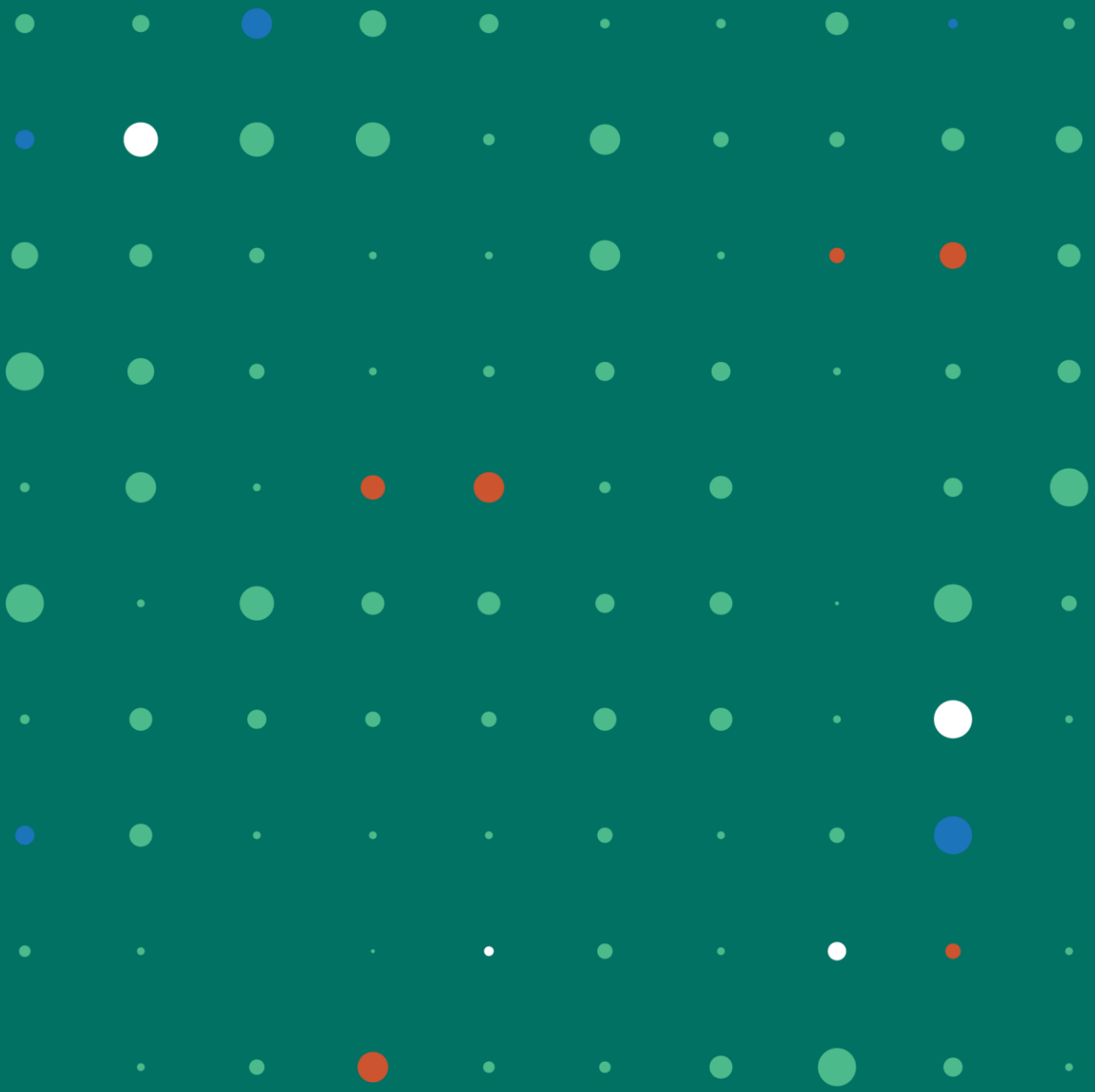

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FOREWORD

Population change occurs in 3 ways: through natural increase, overseas migration and internal migration. Of these, internal migration is often the most uncertain and least understood. Understanding internal migration is important because it is key to forecasting the distribution of the population and the flows of people between areas. Accurate forecasts allow governments to better plan future investment and service provision for Australian communities.

The Centre for Population engaged the Queensland Centre for Population Research, University of Queensland, to develop forecasts and projections of Australia's future internal migration. The Queensland Centre for Population Research has a team of highly experienced demographers, geographers and economists with expertise in internal migration and population projections. The team provides a unique skillset and in-depth knowledge of internal migration trends and patterns in Australia.

This report presents the results of the University of Queensland's research for the Centre for Population. This includes a comprehensive analysis of historic internal migration trends, modelling of internal migration levels and patterns, and results of an expert opinion survey used to assess the plausibility of possible internal migration scenarios. Informed by this analysis, the University of Queensland proposed assumptions for 2 main scenarios of possible internal migration outcomes in the short and medium terms. These scenarios take into account the potential effects of the COVID-19 pandemic. The assumptions presented in this report were used to inform the population forecasts and projections in the 2020 Population Statement.

The analysis presented in this report was conducted primarily in September 2020, prior to the 2020–21 Federal Budget and the release of the 2020 Population Statement. Importantly, the analysis was conducted during the second wave of the pandemic in Victoria and prior to the relaxation of associated border and activity restrictions.

The Centre for Population commissioned the Australian Bureau of Statistics to publish provisional Regional Internal Migration Estimates, which were released in November 2020 after the analysis in this report was conducted. These estimates provide early insight into the effect of the COVID-19 pandemic on internal migration at state and territory levels as well as at greater capital city statistical area levels up to June 2020. The next release is expected in early 2021 and will provide estimates for the September 2020 quarter, during which Victoria experienced its second wave of the pandemic. While these provisional estimates were not included in this analysis, the Centre for Population will carefully monitor the next release to inform future internal migration forecasts.

I thank the team of authors from the University of Queensland for their comprehensive analysis and contribution to the work of the Centre: Aude Bernard, Elin Charles-Edwards, Maximiliano Alvarez, Pia Wohland, Julia Loginova and Sunganani Kalemba.

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Executive Summary

Australia has a highly mobile population, with around 40 per cent of people changing their place of usual residence every 5 years. The motivations of people to migrate are varied, and are influenced by demographic, economic, technological and behavioural factors. However, Australia's rate of internal migration has experienced a long-term downward trend, which aligns with trends in other countries.

In 2020, the COVID-19 pandemic has led to the introduction of extraordinary internal population movement restrictions in Australia. The COVID-19 pandemic has had direct and significant impacts on migration within Australia due to the closure of state and territory borders, which has increased the cost of moving, and the economic recession.

It is difficult to predict future levels and patterns of migration within Australia because of a lack of local historical research into internal migration in response to economic cycles, a lack of current data and the length of time since a crisis the scale of COVID-19 has been experienced.

In this context, this report sets assumptions for migration between and within Australian states and territories for use in population projections. The assumptions were informed by a descriptive analysis of the spatial and age-sex patterns of migration as well as time-series modelling that identified factors driving short- and long-term variations in internal migration.

Interstate migration

The rate of interstate migration in Australia has dropped following previous economic shocks and recessions. Modelling shows that prospective migrants respond to changes in national, state and territory economic conditions such as gross domestic product (GDP) per capita, the unemployment rate and house prices. This means interstate migration will likely decline as economic growth in Australia declines. The level of interstate migration is expected to broadly follow economic trends as impacts of the pandemic and associated recession evolve.

The projection assumptions for interstate migration are summarised in Table 1. In these scenarios, the forecast declines in the level of interstate migration in 2019–20 and 2020–21 are among the largest year-on-year falls on record.

Scenario 1 was informed by the Reserve Bank of Australia (RBA) August 2020 baseline scenario (RBA 2020a), which reflected current expectations at the time this analysis was conducted, in which restrictions in Victoria were assumed to lift in late 2020 and few restrictions were assumed to remain in other parts of Australia. The RBA's August 2020 forecasts showed that GDP was expected to grow over 2021–22 and, as a result, interstate migration is assumed to rebound in that year. This reflects a catch-up in delayed moves, similar trends following previous recessions. Scenario 2 assumes a deeper downturn, with extended restrictions in Victoria and other parts of Australia into 2021. For both scenarios, an extended option considered the possibility of a longer economic downturn. A more severe scenario, which would put a near halt to interstate migration, was tested but found limited support in the survey of expert opinion conducted as part of this research.

Spatial patterns of internal migration are assumed to be constant in all scenarios, with the exception of outflows from Victoria. Migration out of Victoria is assumed to be relatively higher than for other states and territories due to extended shutdowns and the resulting economic consequences. This assumption reflects the long-term stability in the direction of interstate migration flows, even during past recessions.

The age profile of migration is assumed to increase by one year to 2040 and another year to 2080. This reflects past trends.

INTRASTATE MIGRATION

Migration within states is not expected to be affected to the same extent as interstate migration. The basis for this assumption is threefold:

- Firstly, COVID-19 hotspots have constrained intrastate migration to a lesser extent and for shorter periods than interstate movement affected by extended state and territory border closures. Travel restrictions may reduce movement out of the Greater Melbourne region in late 2020, however, this is likely to be offset by an increased attractiveness of regional areas once restrictions are eased.
- Secondly, labour market conditions, as measured by the unemployment rate, were stronger outside capital cities in all states and territories, except Queensland and Tasmania.
- Thirdly, the combined effect of young adults returning home as well as an increase in teleworking may support greater migration to regional Australia.

These conditions lead to a single proposed scenario where the migration level is held constant but the net pattern of intrastate inter-Greater Capital Cities and Statistical Area (GCCSA) migration shifts by 5 per cent in favour of regional areas in each state in 2020–21. This scenario was supported by expert opinion collected through the survey on the assumptions developed in this research. The short-term shift was also supported by modelling that showed migration between capital cities and the rest of states responds to economic conditions, including relative unemployment rates and house prices. The balance of net gains and losses is assumed to remain stable in the Northern Territory due to its demography and historical flows between Darwin and the rest of the Territory.

The pattern for all states and territories is assumed to return to a 10-year average in 2023–24 as shown in Table 2.

Tables 1 and 2 summarise the projection assumptions for interstate and intrastate migration, respectively. The assumptions for Scenario 1 were used to inform the population forecasts and projections in the 2020 Population Statement.

Table 1. SUMMARY OF HEADLINE PROJECTIONS AND ASSUMPTIONS FOR INTERSTATE MIGRATION

Assumptions	Scenario	2019–20	2020–21	2021–22 and beyond
Level of interstate migration (net interstate migration totals)	Scenario 1 Economy follows the RBA forecast, and state and territory border closures are expected to ease in late 2020.	Decline of 5 per cent	Decline of 15 per cent	Increase of 8 per cent followed by a recovery to 20-year average within 2 years.
	Scenario 1 (Extended) Prolonged economic downturn.	Decline of 5 per cent	Decline of 15 per cent	Increase of 8 per cent followed by a recovery to 20-year average within 5 years.
	Scenario 2 Economy follows the RBA forecast, and state and territory border closures are expected to extend into 2021 as a result of localised COVID-19 outbreak.	Decline of 15 per cent	Decline of 30 per cent	Recovery to 20-year average within 3 years.
	Scenario 2 (Extended) Prolonged economic downturn.	Decline of 15 per cent	Decline of 30 per cent	Recovery to 20-year average within 5 years.
Pattern of interstate migration (in and out migration rates to be constrained to net interstate migration totals)	All scenarios	Baseline spatial pattern derived from 2018–19 population estimates.	All in and out flows to decline by per cent decline provided by each scenario (e.g. 15 per cent in Scenario 1), except Victoria where out migration remains unchanged (more people are assumed to leave Victoria compared with other states). Migration patterns out of Victoria follow last 20-year average allocation.	Convergence to baseline spatial pattern (20-year average) within 3 years.
Age profile of interstate migration	All scenarios	Ageing of the migration age profile by one year by 2040 and by another year by 2080.		

Table 2. SUMMARY OF HEADLINE PROJECTION ASSUMPTIONS FOR INTRASTATE GCCSA MIGRATION

Assumptions	
Level of intrastate GCCSA migration	The level is held stable at 2018–19 levels until 2021–22 then converges to the 10-year average in 2023–24.
Pattern of intrastate GCCSA migration	In 2020–21, net intrastate GCCSA flows are shifted by 5 per cent in favour of the rest of state except in the Northern Territory where the pattern is held stable. This pattern holds until flows converge to the 10–year average in 2023–24 in scenarios 1 and 2 and 2027–28 in the extended scenarios.
Age profile of GCCSA migration	Ageing of the migration age profile by one year by 2040 and by another year by 2080.

1. Introduction

With nearly 40 per cent of the population changing address every 5 years, Australia's population is among the most mobile in the world (Bell et al. 2015). This high level of population movement is underpinned by low lifetime immobility (few people not moving in their lifetime) combined with a high level of repeat movement (many people moving multiple times in their lifetime) (Bernard et al. 2017). The average Australian moving 13 times during their lifetime (Bell 1996). Mobility is integral to an Indigenous way of life (Taylor and Bell 1996). It is also a tradition inherited from migrant forebears as seen in other settler countries such as Canada, the United States of America and New Zealand (Long 1991). This desire for mobility has continued into the 21st Century facilitated by flexible labour and housing markets (Sánchez and Andrews 2011).

Geographical mobility was significantly interrupted in March 2020 as restrictions on internal movement were imposed in the wake of the COVID-19 pandemic. All states and territories imposed partial or complete border closures as shown in Table 3. These restrictions limited interstate travel but did not prohibit moving to take up permanent residency. Therefore, these restrictions should have a limited and short-lived effect on interstate migration. However, the economic recession from June 2020 is likely to have a profound and longer-lasting effect. Unemployment reached 7.6 per cent in June 2020 (ABS 2020); a 2 percentage point increase in just 3 months and the highest level since October 2001. In August 2020, the RBA forecasted the unemployment rate to rise to around 10 per cent in 2020 (RBA 2020); a level that had not been seen since the recession of the early 1990s. A return to pre-COVID-19 pandemic unemployment was not expected until 2024 (Deloitte 2020). Similarly, GDP declined by 8 per cent in June 2020 and was not anticipated to recover until mid-2021 as shown in Table 4. These sources reflected current expectations at the time this analysis was conducted.

Table 3. Timeline of State and Territory Border closures, February to September 2020

Date	Key Events
1 February 2020	International travel ban commences.
19 March 2020	All travellers to Tasmania subject to a mandatory 14-day quarantine.
20 March 2020	Australia's international borders closed to all non-citizens and non-residents, with limited exceptions.
24 March 2020	National Cabinet encourages people to stay at home, unless shopping for essentials, travelling to and from work, going to school or exercising. Northern Territory, Western Australia and South Australia introduce border restrictions requiring travellers to self-isolate for 14 days.
26 March 2020	Queensland introduces border restrictions requiring travellers to self-isolate for 14 days.
1 April 2020	Western Australia introduces restrictions on intra-state travel.
11 April 2020	Queensland tightens border restrictions with permits required to cross the border.
30 June 2020	Victorian Government re-enforces local lockdowns across 10 Melbourne postcodes (2 additional postcodes added on 4 July 2020).
8 July 2020	Victorian and New South Wales border closes.
9 July 2020	Victorian Government introduces lockdown in metropolitan Melbourne and in the Mitchell Shire.
2 August 2020	Melbourne enters stage 4 restrictions, stage 3 restrictions for Victoria.
17 September 2020	Restrictions eased in regional Victoria (third step).
25 September 2020	Anyone may enter Queensland from a place that is not a declared COVID-19 hotspot.

Table 4. GDP AND UNEMPLOYMENT FORECAST

	Year Ended					
	Dec 2019	June 2020	Dec 2020	June 2021	Dec 2021	June 2022
GDP growth	2.2	−6.0	−6.0	4.0	5.0	4.0
Unemployment rate (quarterly average)	5.2	7.0	10.0	8.5	7.5	7.0

Source: RBA 2020a.

The impact of the 2020 recession on the level and patterns of migration within Australia is uncertain due to the scale, duration and pervasiveness of the downturn. Moreover, as Australia has not had a recession in 28 years, the links between the level of internal migration and the business cycle in Australia are not well understood. This is in stark contrast with North America (Saks and Wozniak 2011, Molloy and Smith 2019) and Europe (Van Der Gaag and Van Wissen 2008), where there is extensive literature on the cycle of internal migration, particularly after the Global Financial Crisis of 2007–09. It is well established that the level of internal migration varies with the business cycle (Saks and Wozniak 2011, Molloy and Smith 2019) as migrants respond to changes in labour (Molloy, Smith and Wozniak 2014a; Molloy, Smith and Wozniak 2014b) and housing markets (Bricker and Bucks 2016, Modestino and Dennett 2013). While these links are likely to hold in the Australian context, the strengths of these effects remain largely unknown.

At the same time, there is growing evidence that Australia is on a well-established path of declining internal migration, with the level of interstate migration decreasing by 20 per cent over the last 30 years (Bell et al. 2017, Kalemba et al. 2020). Similar to the long-term decline in the Unites States of America (Cooke 2011, 2013) and some other advanced economies (Bell et al. 2018), this secular downward trend is profound and transcends economic cycles. Proposed explanations range from: changes in the composition of the population, in particular, population ageing (Cooke 2011, Rhee and Karahan 2017); a growing share of dual-career households (Guler and Taskın 2013, Vidal et al. 2017) and behavioural changes including a possible substitution with teleworking (Cooke and Shuttleworth 2017) and long-distance commuting (Green, Hogarth and Shackleton 1999). While the relative role of these different factors is uncertain, these societal transformations are likely to play out in the short-to-medium term and should be taken into account when anticipating internal migration.

In this context, this report proposes assumptions for interstate migration and migration between Greater Capital City Statistical Areas (inter-GCCSA migration). This is an essential first step in running population projections which will assist the Australian, state and territory governments with economic and social planning. Assumptions are developed by combining a descriptive analysis of the spatial and age-sex patterns of migration with time-series modelling. This multi-stage approach exposes factors that drive short- and long-term variations in the level of internal migration. Accounting for effects of the COVID-19 pandemic, the analysis is supplemented by a survey of experts and an analysis of recent and historical data on migration intentions and realisation. In doing so, this report answers 2 questions that inform the formulation of migration assumptions:

1. What are the key drivers of interstate and GCCSA migration trends in Australia?
2. Given current knowledge of internal migration, how might it be expected to respond to the COVID-19 pandemic and resulting recession?

Detailed information about the data and methods employed in this study is in Appendix A.

This report is in 8 sections and begins with background information on the long-term decline of internal migration and its links to societal transformations. Section 3 describes short-term fluctuations in the level of interstate migration and identifies links to socio-economic conditions before forecasting future aggregate levels

of interstate migration. Section 4 analyses state-specific trends in population gains and losses, determines the driving factors and forecasts in and out interstate migration rates and bilateral migration flows. Section 5 replicates the analysis for migration between GCCSAs. Section 6 shifts attention to trends in migration age patterns for interstate and inter-GCCSA flows. Section 7 presents internal migration scenarios, which are tested with an expert opinion survey to propose central assumptions. Section 8 provides discussion on the future of internal migration in Australia and its implications.

2. Background: Long-term decline of internal migration

Short-term variations in the level of internal migration have occurred in the context of a long-term decline in internal migration. There has been a 20 per cent decline in the level of interstate migration since this trend started in the mid-1990s (Bell et al. 2017). This downward trend is similar to that observed in the United States and several other advanced economies (Bell et al. 2018). Major social, economic and demographic changes have led to this secular decline in internal migration. These factors are summarised in Table 5.

Table 5. Key factors affecting the level of internal migration in the long-term

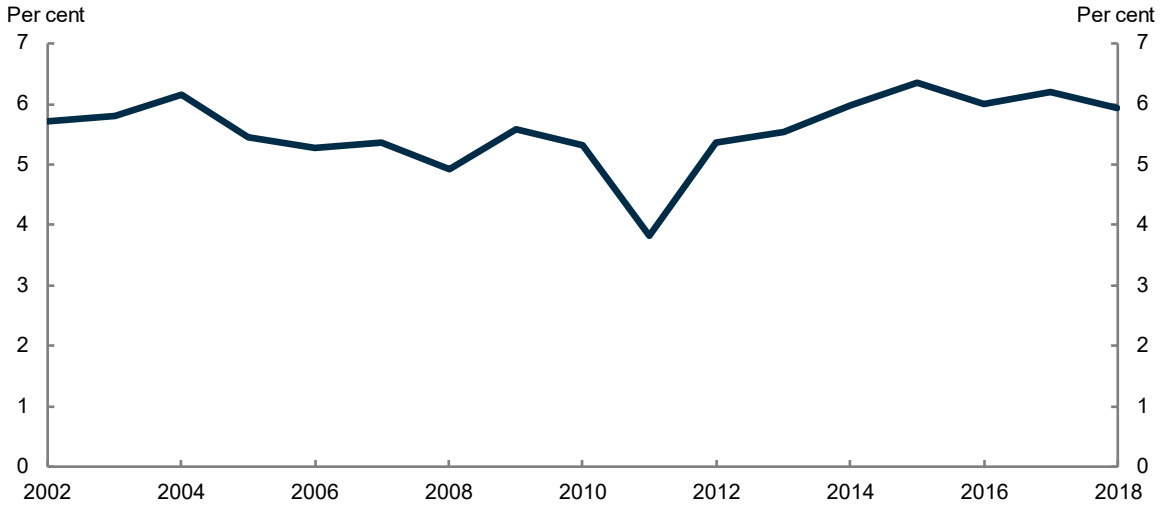
Key Factors	Transmission mechanism	Impact on the level of internal migration
Demographic factors	Population ageing	Decrease
	Delayed transitions to adulthood	Decrease followed by partial recuperation
	Increase in the number of lone person households	Increase
	Increase in the rate of separation and divorce	Decrease
	Smaller household size	Increase
	Increased cultural and ethnic diversity	Unclear
Economic factors	Increasing household debt	Decrease
	Higher proportion of workers in precarious employment	Decrease
	High proportion of tertiary-educated individuals	Increase
	Increase in the share of dual income households	Decrease
	Maturation of the spatial economy	Unclear
	Substitution effects (labour market transitions in lieu of migration)	Unclear
Technological factors	Increase in long-distance commuting	Decrease
	Increase in teleworking	Potential increase in the short-term; Long-term decrease
	Increasing role of technology in sustaining social ties	Decrease
Behavioural factors	Increased place attachment	Decrease

Source: Adapted from Green, Anne, 2018.

Explanations for the decline in migration have revolved around changes in population composition, particularly population ageing (Cooke 2011, Foster 2017, Rhee et al. 2017) and the rise of dual-earner households (Guler et al. 2013, Vidal et al. 2017) which are less mobile than traditional male breadwinning households. However, recent evidence suggests that the effect of an ageing population has been counteracted by an increase in the share of more mobile groups, including lone-person households, renters, tertiary-educated individuals and immigrants (Kalemba et al. 2020). This means that the downward trend in internal migration is the result of a

behavioural change, possibly caused by the substitution of teleworking (Cooke and Shuttleworth 2017) and long-distance commuting (Brown et al. 2015) in place of migration. However, teleworking has only had a modest uptake over the last 2 decades (Chart 1), and decomposition analysis confirms that teleworking has had limited impact on the decline of internal migration in Australia since 2001 (Kalemba et al. 2020). Despite this, the increase in work-from-home arrangements following the lockdown measures in place since March 2020 is a potential disrupter to internal migration. Several media reports suggest that work-from-home arrangements may lead to a resurgence in people moving away from metropolitan areas, altering the pattern of internal migration within Australia. There is, however, no systematic evidence for this at present. According to the Household Impacts of COVID-19 Survey (ABS 2020b), 65.8 per cent of people residing outside Victoria had already physically returned to their workplace by August 2020.

Chart 1. PROPORTION OF EMPLOYED INDIVIDUALS WORKING FROM HOME AT LEAST 50 PER CENT OF THE TIME

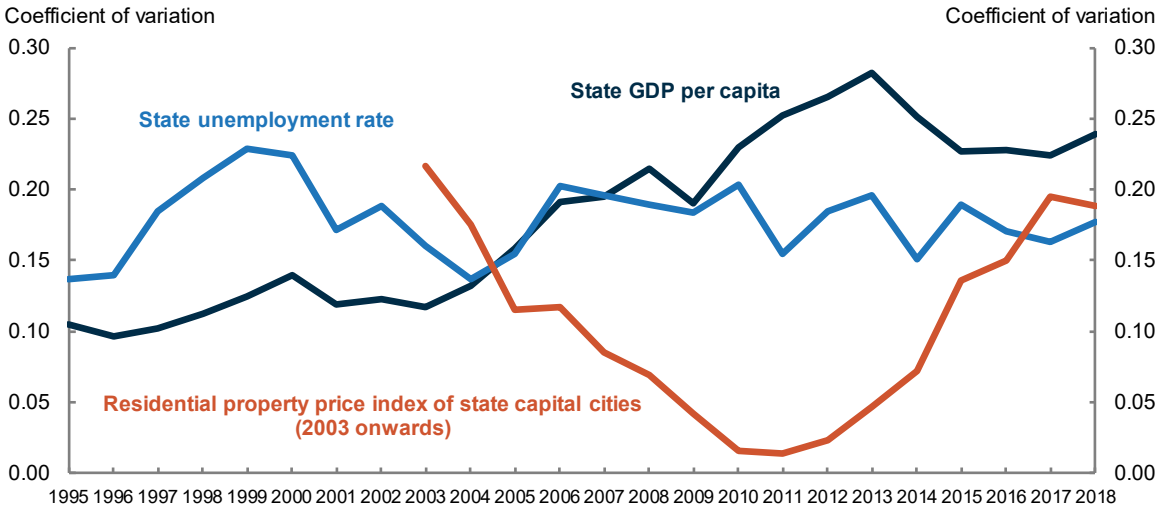


Source: Authors' calculations from Household, Income and Labour Dynamics in Australia Survey, 2019.

Another explanation for declining rates of internal migration is spatial equilibrium in national economies (Harris and Todaro 1970, Todaro 1969). This refers to a decrease in regional variations in unemployment rates, wages and industry composition, which restrains economic incentives to migrate. A comparative analysis of internal migration trends in 18 Organisation for Economic Co-operation and Development (OECD) countries confirmed that growing regional inequalities exert upward pressure on the rate of internal migration (Alvarez, Bernard, and Lieske 2020) as individuals respond to spatial differences in opportunities. In other words, if regional differences in economic opportunities increases, more people will migrate.

State and territory variations in the unemployment rate, income and capital city property prices for Australia, as measured by coefficients of variation, are shown in Chart 2. State and territory variations in unemployment have been relatively stable for more than a decade, while variations in residential property prices appear cyclical. However, variations in GDP per capita have progressively widened, which indicates that disparities between states and territories are growing. As such, these variations provide mixed results that do not support the hypothesis of regional convergence for Australia.

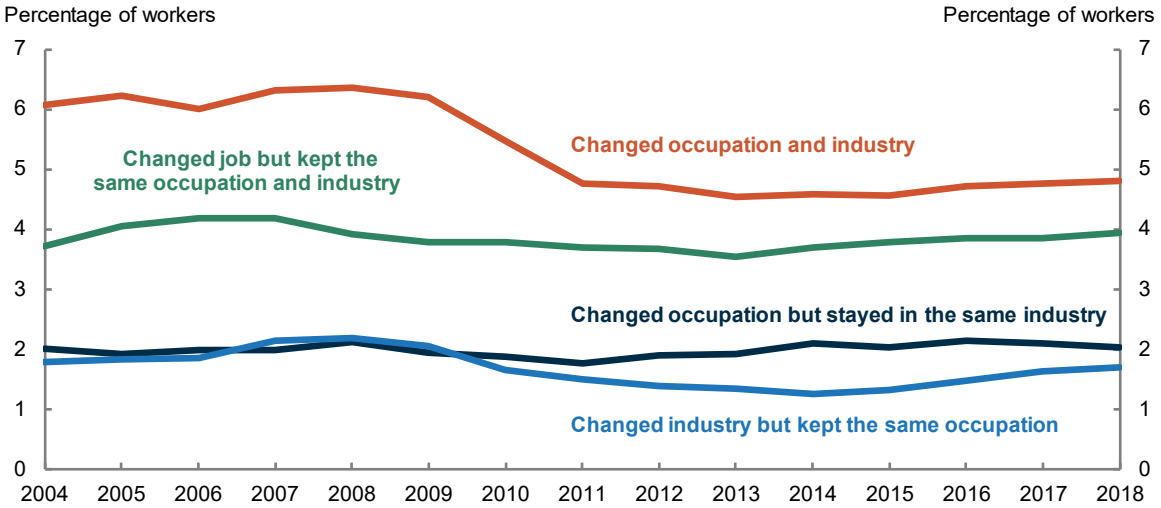
Chart 2. COEFFICIENTS OF VARIATION, STATE GDP PER CAPITA, UNEMPLOYMENT RATE AND RESIDENTIAL PROPERTY PRICES



Source: OECD Regional Statistics, GDP per capita, constant prices, base year 2015; ABS 2020a, trend series; ABS 2020e.

Evidence from the United States indicates a lack of migration response to interregional demand shocks, with workers adjusting their labour market participation and occupation locally rather than migrating to another state (Molloy, Smith and Wozniak 2014b, Partridge et al. 2012). Given that widening regional disparities have not been accompanied by a rise in internal migration, it is possible that a similar process is at play in Australia. This idea is explored in Chart 3 by plotting the proportion of workers who changed job, industry and occupation over time. The proportion of workers who stayed in the same industry and occupation while changing employment has been relatively stable at about 4 per cent. However, the proportion of workers who changed industry and occupation has declined, particularly since the Global Financial Crisis of 2007–09. Together, these results suggest that workers do not adjust their occupation or industry in lieu of migration.

Chart 3. JOB, INDUSTRY AND OCCUPATION SWITCHING AS A PROPORTION OF WORKERS, 2004–18

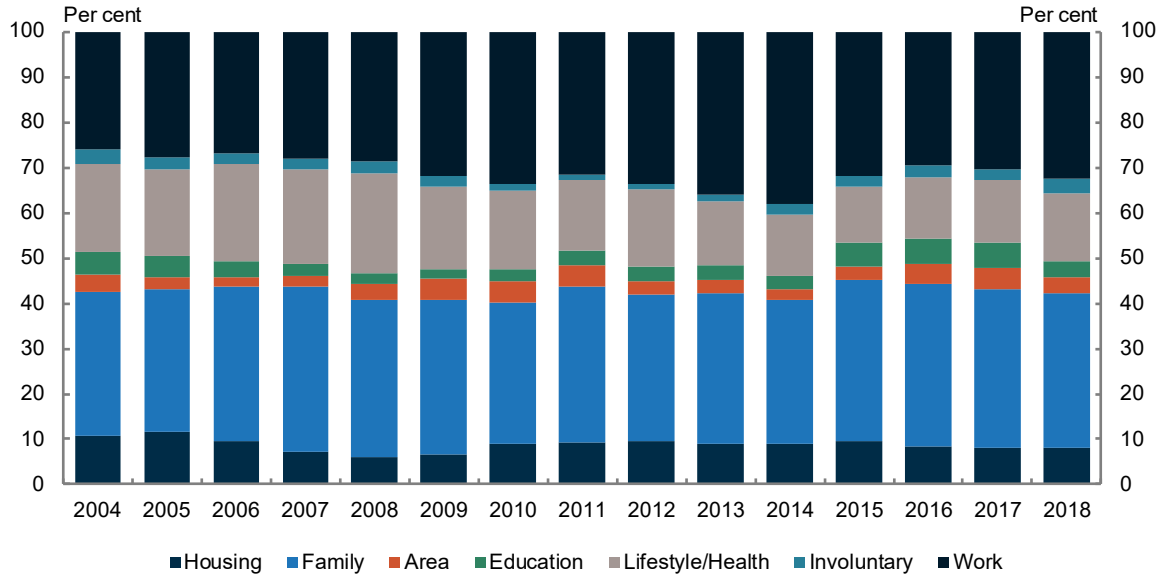


Source: Authors' calculations from Household, Income and Labour Dynamics in Australia Survey, 2019.

Trend analysis of reason-specific migration rates has shown that all reasons for migrating interstate in Australia have declined over time (Kalemba 2020b), which means that the composition of reasons for migrating have been stable (Chart 4). The universal decline in migration across all reasons for moving coupled with the dominance of non-economic considerations (family, housing and lifestyle) indicates that migration is not driven solely by economic gain. This feature is shared by all states and territories (Chart 5) and it distinguishes the Australian migration system from other developed nations where employment is typically the main motive for

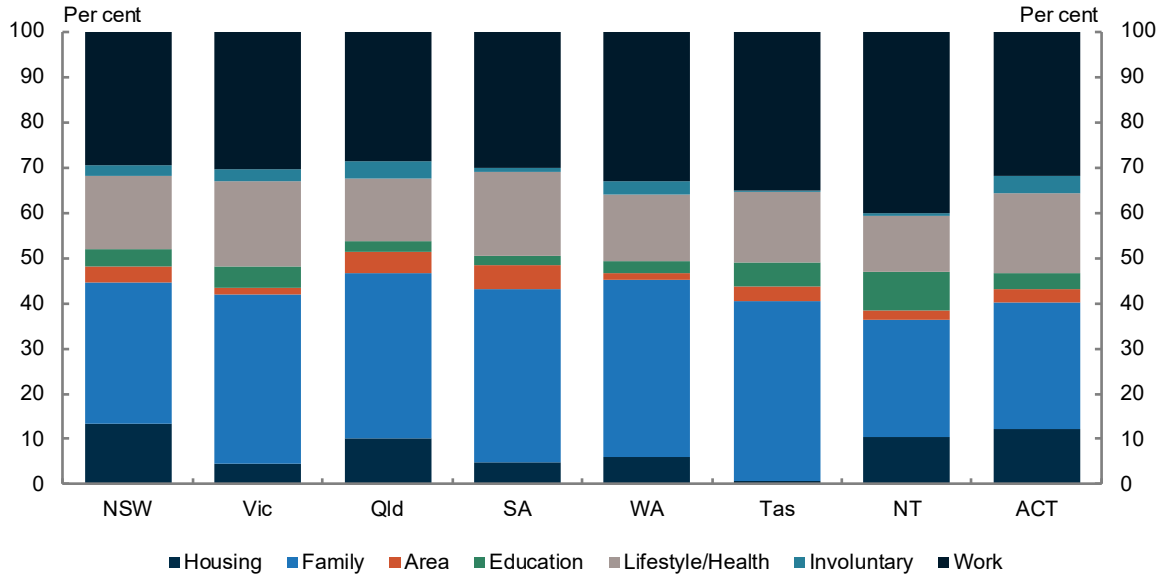
moving (Thomas, Gillespie and Lomax 2019, Niedomysl 2011). Despite the importance of non-economic motives, prospective migrants still need to find suitable employment at their destination. Thus, macroeconomic conditions play a role in migration decisions for working-age individuals.

Chart 4. REASONS FOR MIGRATING INTERSTATE, 2004–18



Source: Authors' calculations from Household, Income and Labour Dynamics in Australia Survey based on three-year moving averages.

Chart 5. REASONS FOR MIGRATING INTERSTATE BY DESTINATION, AVERAGED OVER 2002–18



Source: Authors' calculations from Household, Income and Labour Dynamics in Australia Survey averaged over 2002–18.

Importantly, the universal decline in migration across all reasons for moving interstate (Chart 4) supports the notion of a general shift in migration behaviour toward increased place attachment or 'rootedness' (Cooke 2011). As individuals place greater attachment to local ties and social capital (Clark and Lisowski 2019, Mangum and Coate 2018, Schellenberg et al. 2018), they are less likely to migrate. Alternatively, some individuals may be 'stuck in place' because they do not have the means to migrate in an environment of stagnating wages. In the United States, this has been interpreted through the perspective of race (Foster 2016) with African Americans less likely than their counterparts to migrate even if they wish to. In Australia, differences relate to socio-economic backgrounds. Between 2001 and 2016, people working in low-skilled occupations or working

part-time exhibited a greater decrease in their propensity to migrate than did high-income earners (Kalemba et al. 2020). This is likely due to lower economic returns to migration for those groups (Mitchell 2008). This raises the prospect of a two-tiered migration system in Australia, consisting of people who can move and people who are stuck in place. Some of these factors will continue to play out in the short-term and are likely to exert additional downward pressure on interstate migration.

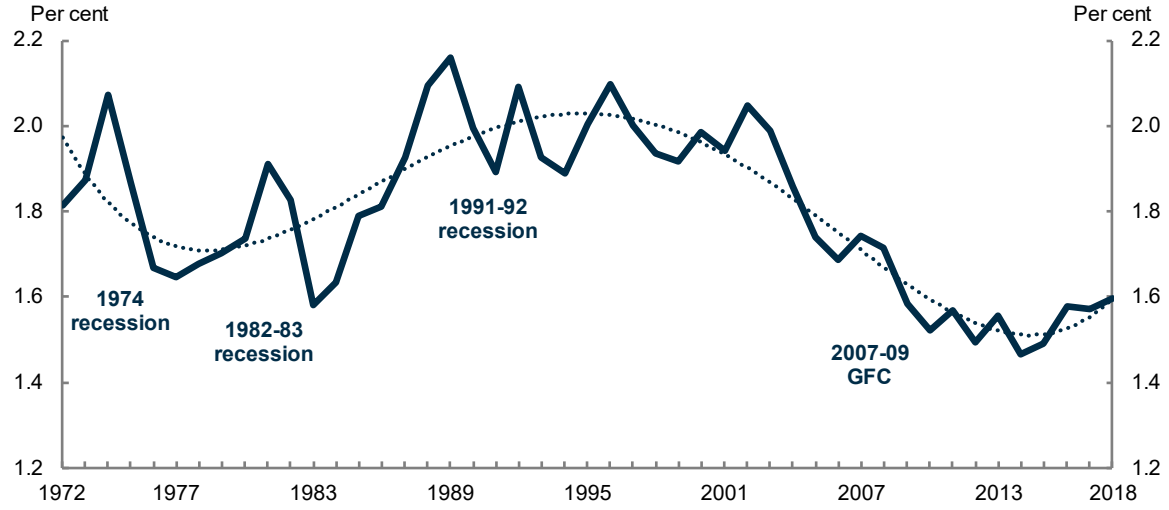
3. Trends in the rate of interstate migration

3.1 Descriptive statistics

This section examines trends in the level of interstate migration using annual interstate migration rates dating back to the 1970s. These data are complemented with a range of socio-economic indicators from the Australian Bureau of Statistics, the OECD regional database, and the Household, Income and Labour Dynamics in Australia Survey.

Historical data (Chart 6) show significant volatility, with sharp drops in the annual interstate migration rate that coincide with economic downturns. These are followed by significant rebounds in interstate migration, with the exception of the Global Financial Crisis of 2007–09 which did not lead to a recession in Australia. The recession in Australia during the early 1970s resulted in a 20 per cent decline in interstate migration over a 3-year period followed by an upswing in 1978. The largest-ever decrease year-on-year in the interstate migration rate in Australia was in the early 1980s with a -13.5 per cent decline in the aftermath of that economic recession. This was followed by a strong rebound with Australia recording its highest level of interstate migration in 1989. The sharp decline of the early 1980s was the result of a significant decrease in outflows from all states and territories, particularly South Australia and Victoria, which each recorded declines of over 20 per cent. The exception to this was Queensland, which recorded a proportionally smaller decline of 2 per cent. With respect to interstate arrivals, the Northern Territory experienced the biggest decline followed by Queensland and Western Australia, with drops greater than 18 per cent. The declines that followed the recession of the early 1990s and the Global Financial Crisis were smaller and short-lived, at about 8 per cent.

Chart 6. Annual interstate migration rate, 1972–2018



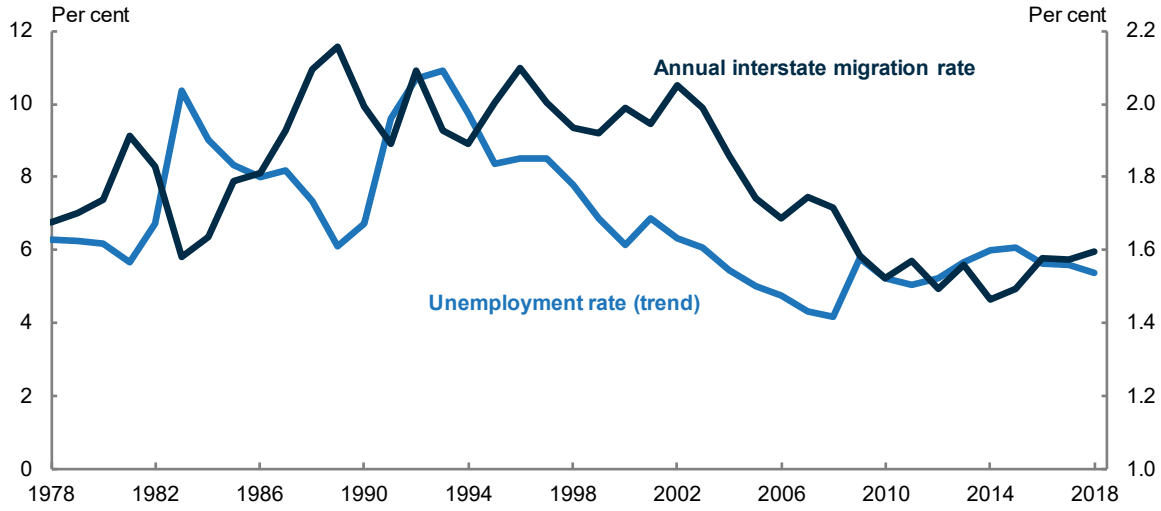
Note: Migration is measured as the end of June. A fourth-degree polynomial is depicted in the dotted trend line.
Source: ABS 2020f.

This cyclical pattern is not surprising. Evidence from North America and Europe suggests the level of internal migration varies in tandem with the business cycle (Molloy and Smith 2019, Saks and Wozniak 2011, Milne 1993) as migrants respond to labour and housing markets. In the United States, the cycles of internal migration are driven by a reduction in the net benefits of migrating overall and not by variations in the geographic dispersion of economic opportunities. Empirically, this occurs in most OECD countries through the negative association of internal migration rates with unemployment (Van Der Gaag and Van Wissen 2008) and regional inequalities (Alvarez et al. 2020). This is compounded by the fact that people have an emotional attachment to their home and neighbourhood of residence that can often exceed a monetary value (Clark et al. 2019). The uncertainty associated with migrating and the potential loss of social capital deters migration in a way that

cannot be explained using economic terms (Kosar, Ransom and der Klaauw 2020, Clark and Lisowski 2019). This is heightened during economic slowdowns.

To explore the procyclicality of migration in Australia, interstate migration rates were plotted against the unemployment rate, which is a common measure of the business cycle. Chart 7 shows that until the mid-1990s unemployment shaped the cyclical component of interstate migration, with migration troughs coinciding with unemployment peaks, particularly in the early 1980s. Inversely, the increase in interstate migration between 1983 and 1989 corresponded to a phase of receding unemployment. In the early 1990s, interstate migration declined in parallel with the rise in unemployment. Interstate migration bounced back before unemployment peaked in 1993 but decreased again the following year. Since the recession of the early 1990s, this negative relationship has ceased as migration and unemployment experienced 3 decades of declining rates. That is, the improvement in economic conditions that led to 28 years of uninterrupted economic growth did not boost interstate migration.

Chart 7. ANNUAL INTERSTATE MIGRATION RATE AND NATIONAL UNEMPLOYMENT RATE, 1978–2018



Source: Unemployment: ABS 2020a, trend series. To be consistent with the timing of migration, the trend series unemployment rate measured in June was used. The series starts in 1978. Migration: ABS 2020f.

3.2 EXPLAINING AND FORECASTING THE RATE OF INTERSTATE MIGRATION

To further understand trends in the rate of interstate migration, this section models interstate migration rates as a function of a series of national socio-demographic indicators from 1978 to 2019. These indicators are real GDP per capita, unemployment rate, female labour force participation and the share of the population aged 20 to 40 years. Two sets of models were run to distinguish between long- and short-term associations between interstate migration and explanatory variables. Results in Table 6 indicate that GDP per capita is the only one of these variables that exerts a statistically significant effect on interstate migration in both time periods, being negative in the long-run but positive in the short-term. In the short-term, a one per cent increase in GDP per capita results in a 1.53 per cent increase in the rate of interstate migration. Inversely, a decline in GDP per capita will drive interstate migration down. This apparent contradiction can be explained in light of the long-term decline of internal migration (see Section 2). As countries develop economically, the level of internal migration goes down, presumably due to progressive substitution with teleworking and long-distance commuting. This is because GDP per capita affects resources available to prospective migrants who respond to labour market opportunities and the creation of jobs in the upward phase of the business cycle.

It is worth noting, however, that the national unemployment rate does not have a statistically significant effect on the interstate migration rate, although relative unemployment between states and territories does (see Section 4). At a national level, this can be explained by unemployment acting in opposite directions. For

example, an increase in the unemployment rate can be due to a diminished demand for workers, reducing job availability, which exerts downward pressure on employed individuals seeking new jobs as opportunities are reduced. Conversely, an increase in the unemployment rate can increase the proportion of unemployed individuals who are more mobile than those who are employed. This does not mean that internal migration will be immune to the current rise in unemployment Australia is experiencing as a result of the COVID-19 pandemic. Unemployment reached 7.6 per cent in June 2020 (ABS 2020), a 2 percentage point increase in just 3 months and the highest level since October 2001. In August 2020, the RBA forecasted the unemployment rate to rise to around 10 per cent in late 2020 (RBA 2020a), a level not seen since the mid-1990s and which would lead to the steepest quarter to quarter increase since 1978. This reflected current expectations at the time this analysis was conducted. Based on historical trends, such a sharp increase is likely to reduce interstate migration. However, compared with the recessions of the 1980s and the 1990s, interstate migration is already at a historical low. While this decrease might not be as pronounced as in the past, it may stretch over a longer period. At the time this analysis was conducted, some economic forecasts did not indicate a return to pre-COVID-19 pandemic unemployment until 2024 (Deloitte 2020).

The only other variable that is statistically significant in the model is the percentage of 20 to 40 year old workers, which has a positive association with interstate migration in the long-term. An increase in the percentage of workers aged 20 to 40 will increase the interstate migration rate, while a decrease in the share of these workers will exert downward pressure on interstate migration. Thus, as the Australian population ages, interstate migration is expected to remain low.

Table 6. REGRESSION COEFFICIENTS, INTERSTATE MIGRATION RATE, 1978–2019

	Long-term effect on interstate migration	Short-term effect on interstate migration
GDP per capita	-0.71***	1.53***
Unemployment rate	0.61	0.15
Female labour force participation	-0.08	1.53
Per cent of the population aged 20 to 40	0.93***	0.43

Level of statistical significance * p<0.05, ** is p<0.01, *** p<0.001.

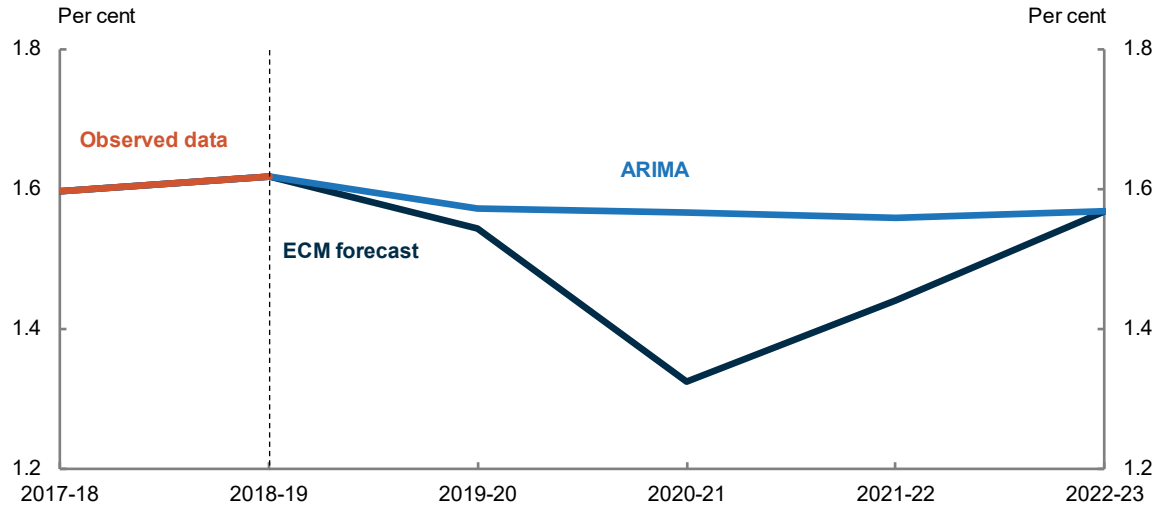
Source: GDP per capita: OECD 2020; Unemployment rate and female labour force participation: ABS 2020a; Population: ABS 2020c.

Note: All explanatory variables are measured at the national level. The long-term effect model is a dynamic Ordinary Least Squares model, while the short-term effect model is an underlying Error Correction Model. See Appendix A for further information.

Coefficients should be interpreted as follows: in the short-term, a one per cent increase in GDP per capita results in a 1.53 per cent increase in the rate of interstate migration.

Based on results from this modelling, a forecast of the level of interstate migration can be made by factoring in the RBA's forecast of GDP per capita published in August 2020 (RBA 2020a), which were current forecasts at the time this analysis was conducted. In August 2020, the RBA anticipated GDP per capita to decline in the second half of 2020 and reach its lowest level in mid-2021 before bouncing back. Chart 8 plots this internal migration forecast and a univariate Autoregressive Integrated Moving Average forecast, which assumes existing trends continue. Interstate migration is expected to decline by 5 per cent in 2019–20 before reaching historically low levels of 1.32 per cent mid-2021, corresponding to a 15 per cent year-on-year decline, before rebounding in subsequent years.

Chart 8. INTERSTATE MIGRATION RATE FORECAST

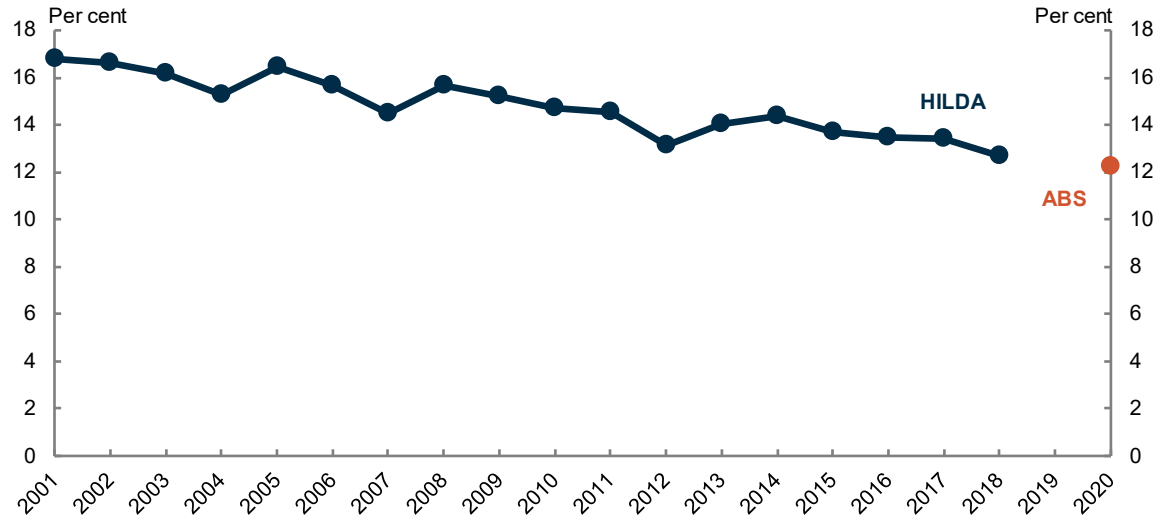


Source: Observed data: ABS 2020c. Forecasts: Authors' calculations.

This forecast forms the basis of Scenario 1. It assumes that while some migration will be postponed during the initial responses to the COVID-19 pandemic, a reasonable proportion will be undertaken in the following year. This pattern mirrors those observed in previous recessions.

This scenario aligns with results from the Australian Bureau of Statistics June 2020 Impact of COVID-19 Survey, in which 93.7 per cent of respondents stated that the COVID-19 pandemic did not influence plans to migrate in the coming 12 months. Results from this survey indicated that 12.3 per cent of respondents were likely to change their address in the coming 12 months. This result is in line with mobility intentions collected in 2018 as part of the Household, Income and Labour Dynamics in Australia Survey (Chart 9). It corresponds to only a 2.92 per cent decline, which suggests there will not be an abrupt drop in the level of population movement.

Chart 9. PROPORTION OF THE POPULATION WHO ANTICIPATE CHANGING ADDRESS IN THE NEXT 12 MONTHS

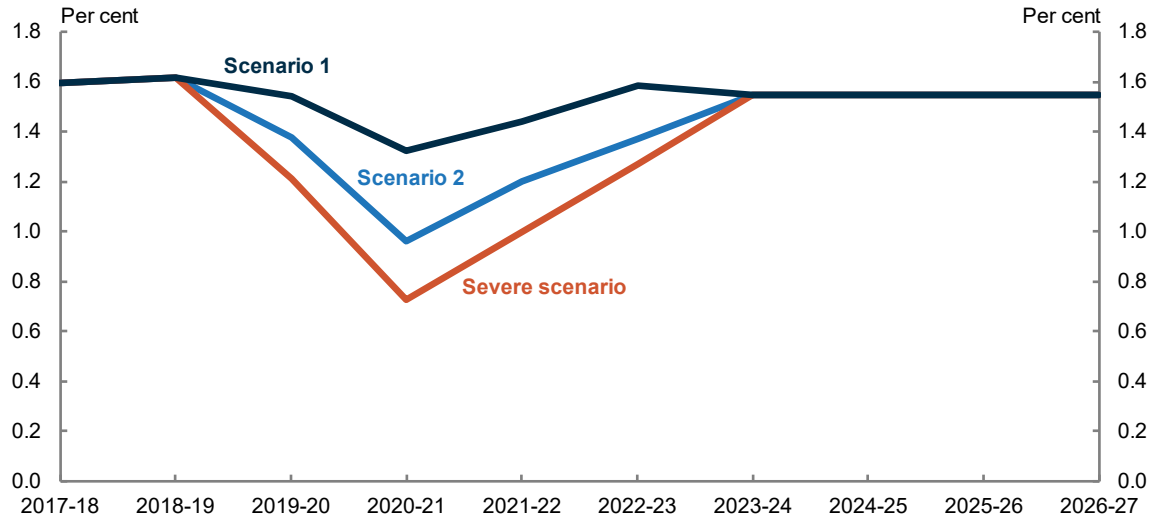


Source: Authors' calculations from Household, Income and Labour Dynamics in Australia (HILDA) Survey from 2001 to 2018. Data for 2019 from ABS 2020b.

3.3 Scenario assumptions

Based on insights gathered in this section, the rate of interstate migration is expected to decline in 2019–20 and reach its lowest level in 2020–21 before rebounding as the economy recovers. The rate of interstate migration is then expected to return to its long-term average. Three possible scenarios are proposed that differ in their extent of decline (Chart 10). In all 3 scenarios, the level of interstate migration in 2019–20 and 2020–21 will be the lowest on record.

Chart 10. Interstate migration scenarios



Source: Authors' calculations based on assumed scenarios.

In Scenario 1, the level of interstate migration is expected to decline by 5 per cent in 2019–20 and then 15 per cent in 2020–21. This is followed by an 8 per cent increase in 2021–22, before interstate migration returns to the 20–year average within 2 years. This assumes that while some migrations will be postponed during the initial responses to the COVID-19 pandemic, a reasonable proportion is recovered in the following year. Such migration levels and patterns mirror those observed in previous recessions and are obtained from a forecast model that takes into account the RBA's August 2020 GDP and unemployment rate forecasts, which were current at the time this analysis was conducted.

Scenario 2 assumes a 15 per cent decline in the level of interstate migration in 2019–20 followed by a 30 per cent decline in 2020–21 before a return to the 20-year average over 3 years. This scenario anticipates a significant level of foregone migration due to the decline in interstate migration being twice the maximum year-on-year decline recorded in Australia since the 1970s. This scenario is motivated by the compounding effects of increased costs of moving interstate caused by border closures and quarantine, which cannot be factored into traditional forecast models, and the lagged effect of decreased net overseas migration on interstate migration. It also captures the impact on migration if the economic effects are more significant than current forecasts.

A more severe scenario was tested, assuming a 25 per cent decline in interstate migration in 2019–20 followed by a 60 per cent decline in 2020–21. This scenario could be realised if state and territory border closures persist into mid-2021, in the event of new COVID-19 outbreak waves, or if a significant reduction in house prices occurs, which would constrain movement.

The plausibility of each scenario is tested using an expert opinion survey described in Section 7.

4. STATE-SPECIFIC TRENDS

4.1 DESCRIPTIVE STATISTICS

Migration is inherently a spatial process that redistributes people across settlement systems. To form assumptions for internal migration, it is essential to understand whether changes in the level of interstate migration have been accompanied by shifts in the direction of flows. This section focuses on state-specific trends, starting with a description of in, out and net migration rates since 1978. Several clear patterns are evident (Chart 11) that are expected to continue in the future:

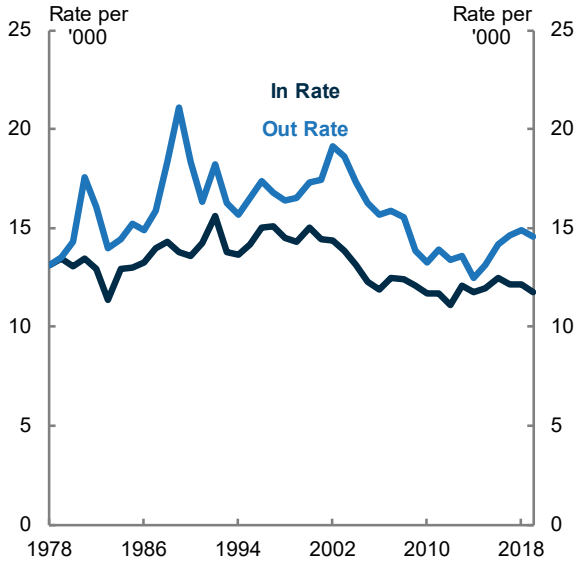
1. New South Wales and South Australia have continued population losses.
2. Queensland experienced population gains and a renewed attractiveness after a decade of positive, though declining, net migration rates.
3. Victoria experienced net population gains in 2009 after decades of losses, although the rate of in migration started to slow in 2017.
4. Western Australia's procyclical net migration rates are linked to the mining cycle, with the state recording negative rates in the last 5 years.
5. The Australian Capital Territory has an oscillating migration trend with a net migration rate hovering around zero in recent years.
6. The Northern Territory has had a downward trend in both in and out migration since 2010.

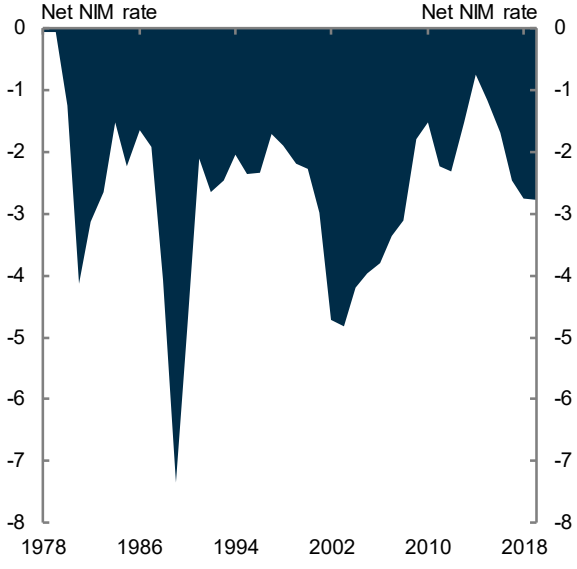
Trends in population losses in New South Wales and population gains in Queensland transcend economic cycles. Victoria, South Australia and Tasmania experienced pronounced population losses at the end of the 1990–91 recession, particularly Tasmania, which recorded net population losses for a decade.

The largest interstate migration streams are between the 3 most populous states of New South Wales, Queensland and Victoria (Chart 12 and Chart 13). The biggest of these are flows from New South Wales to Queensland, followed by flows from Victoria to Queensland. Some of the flows to Queensland include recently arrived immigrants who migrated to Queensland after arriving and residing in Sydney and Melbourne, the main ports of entry to Australia, although this system has become more balanced over time. New South Wales and Victoria had a more balanced system of exchange over the study period. Other states and territories have tended to draw migrants from a diverse array of origins. The exception are flows between the Australian Capital Territory and New South Wales, reflecting their geographic proximity. Also noteworthy is the increased tendency for Western Australia to draw migrants from Queensland, particularly since the mid-2000s. Overall, interstate migration patterns have been broadly stable over the last 40 years, even during periods of recession. While some flows subsided, the general direction remained unchanged. The quantum of gains and losses is, however, variable over this period.

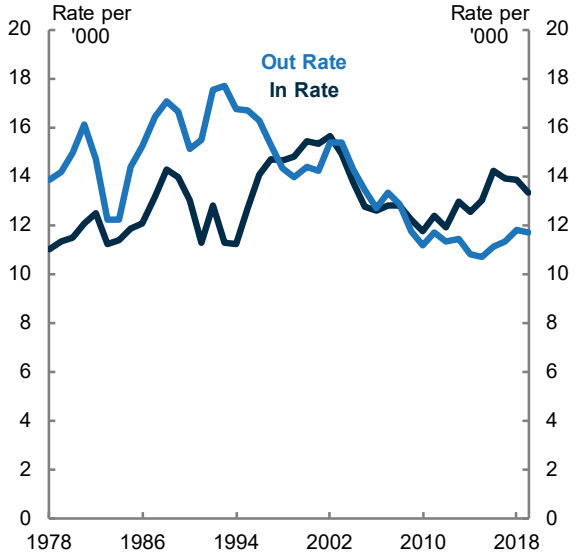
Chart 11. In, out and net interstate migration rates, 1978–2019

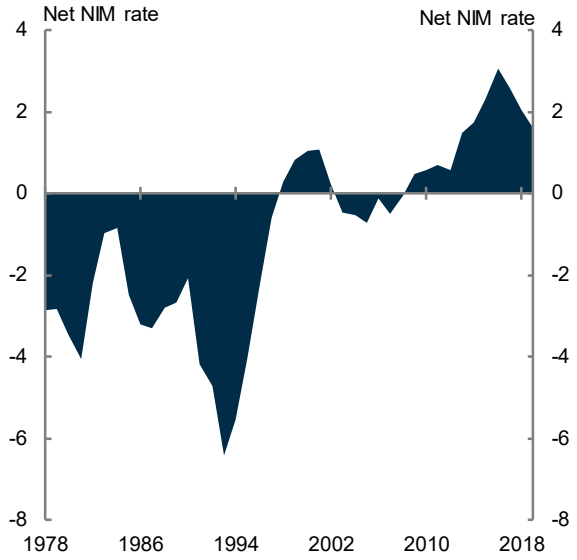
New South Wales



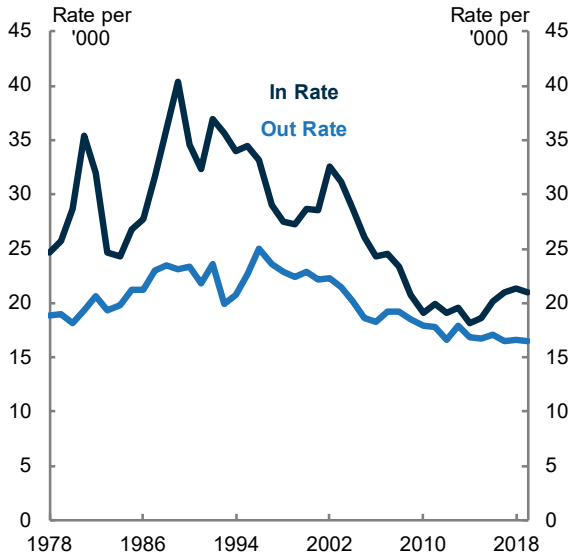


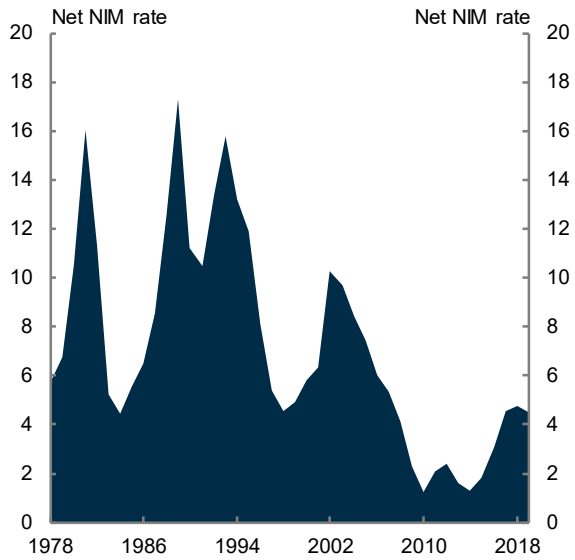
Victoria



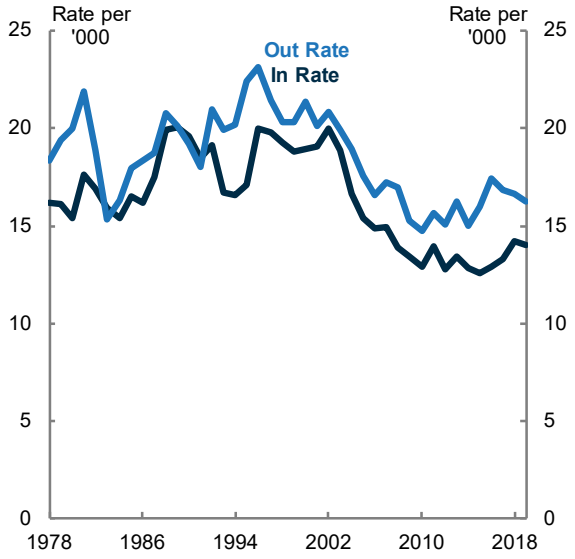


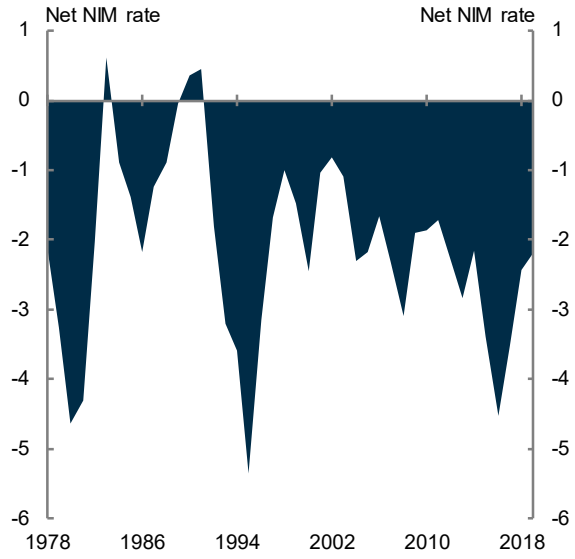
QUEENSLAND



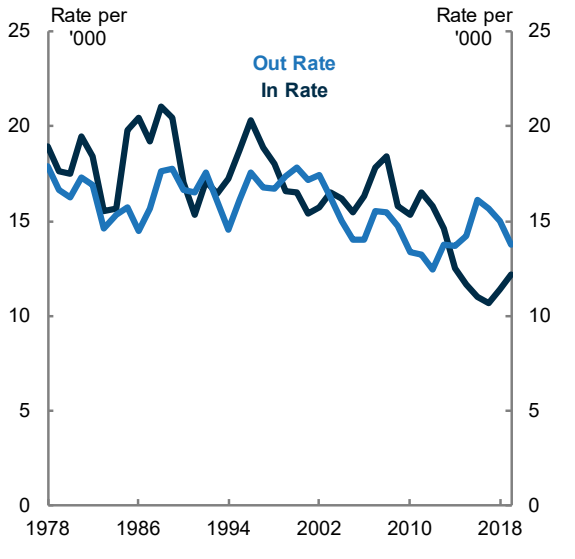


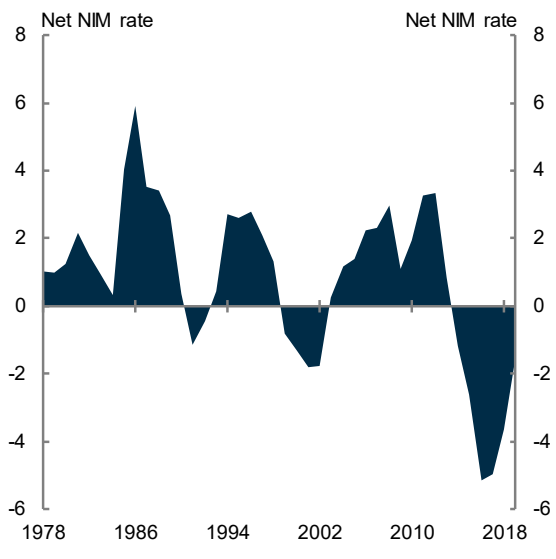
SOUTH AUSTRALIA



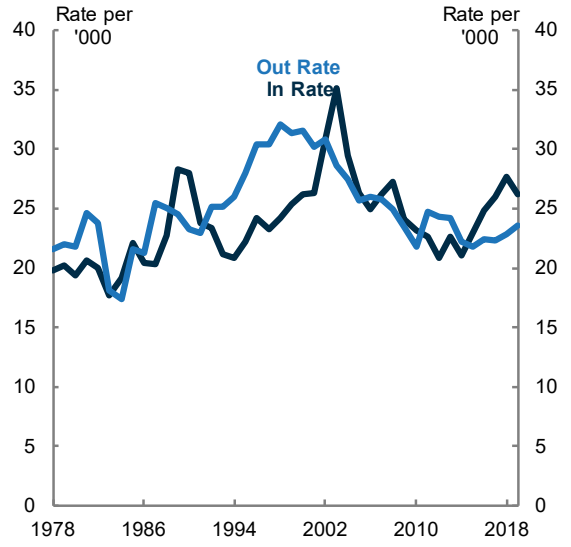


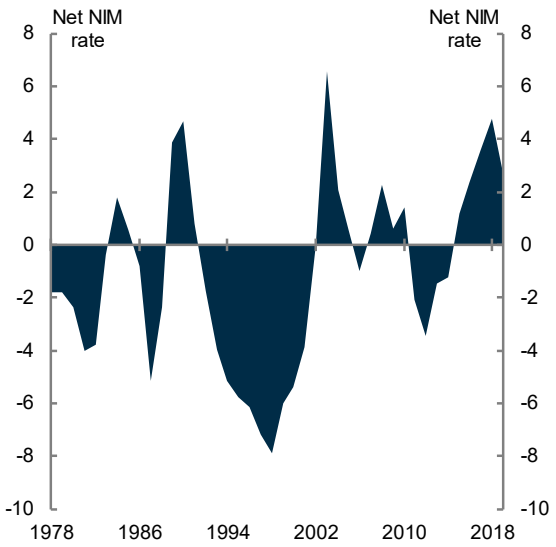
WESTERN AUSTRALIA



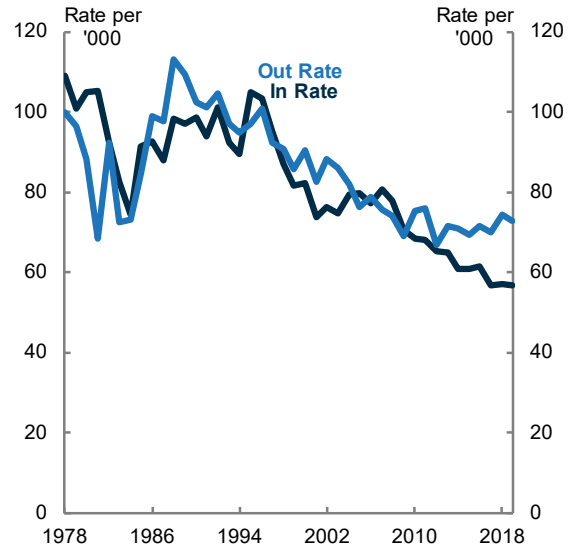


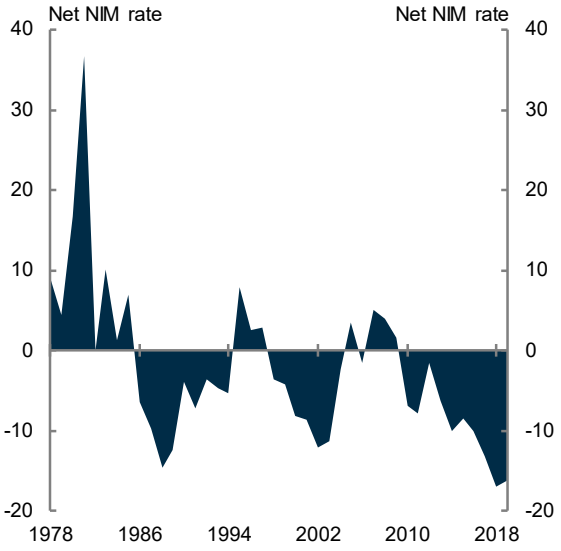
TASMANIA



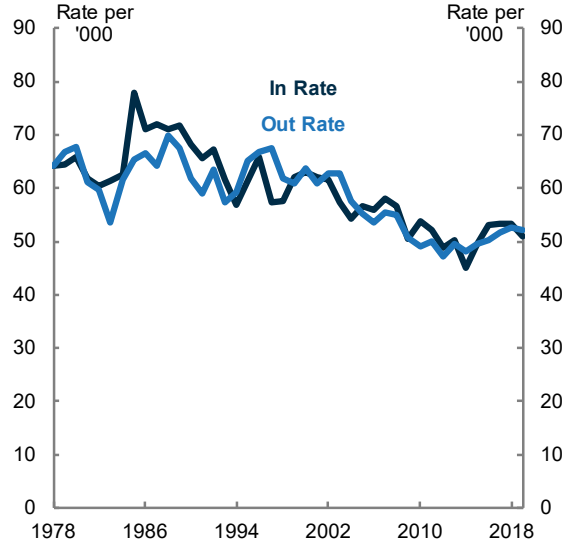


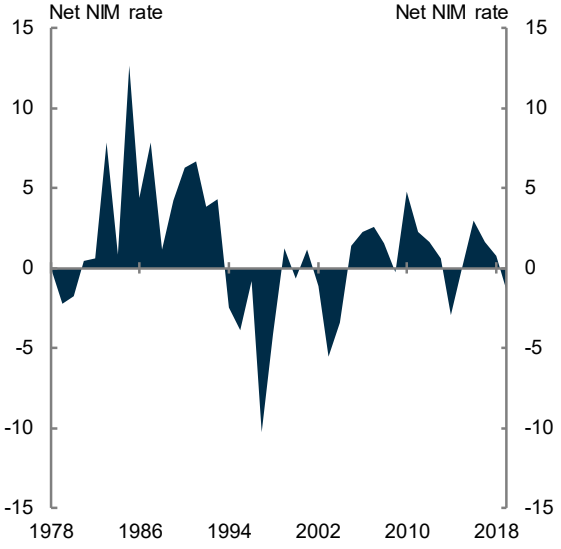
NORTHERN TERRITORY





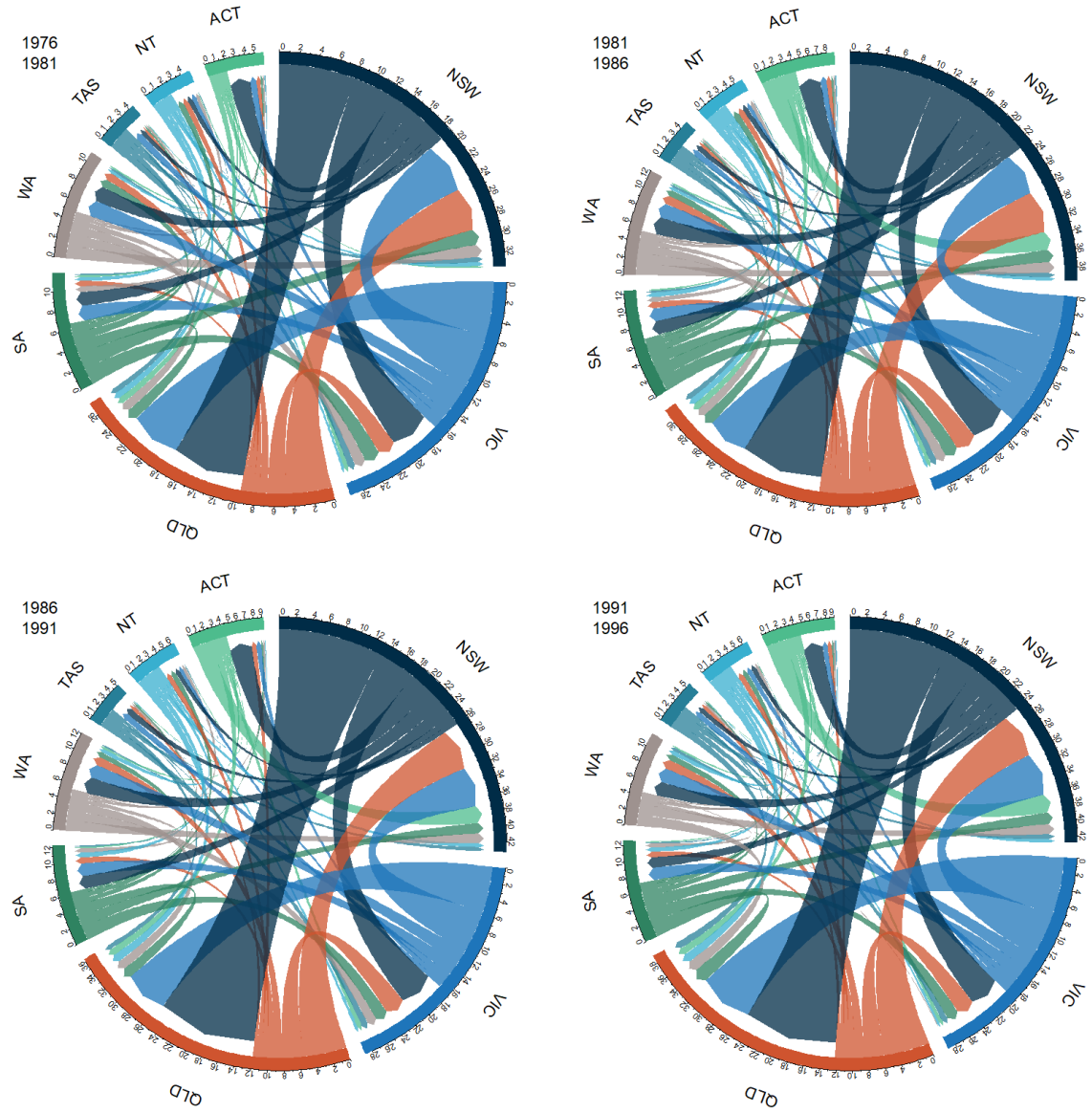
AUSTRALIAN CAPITAL TERRITORY





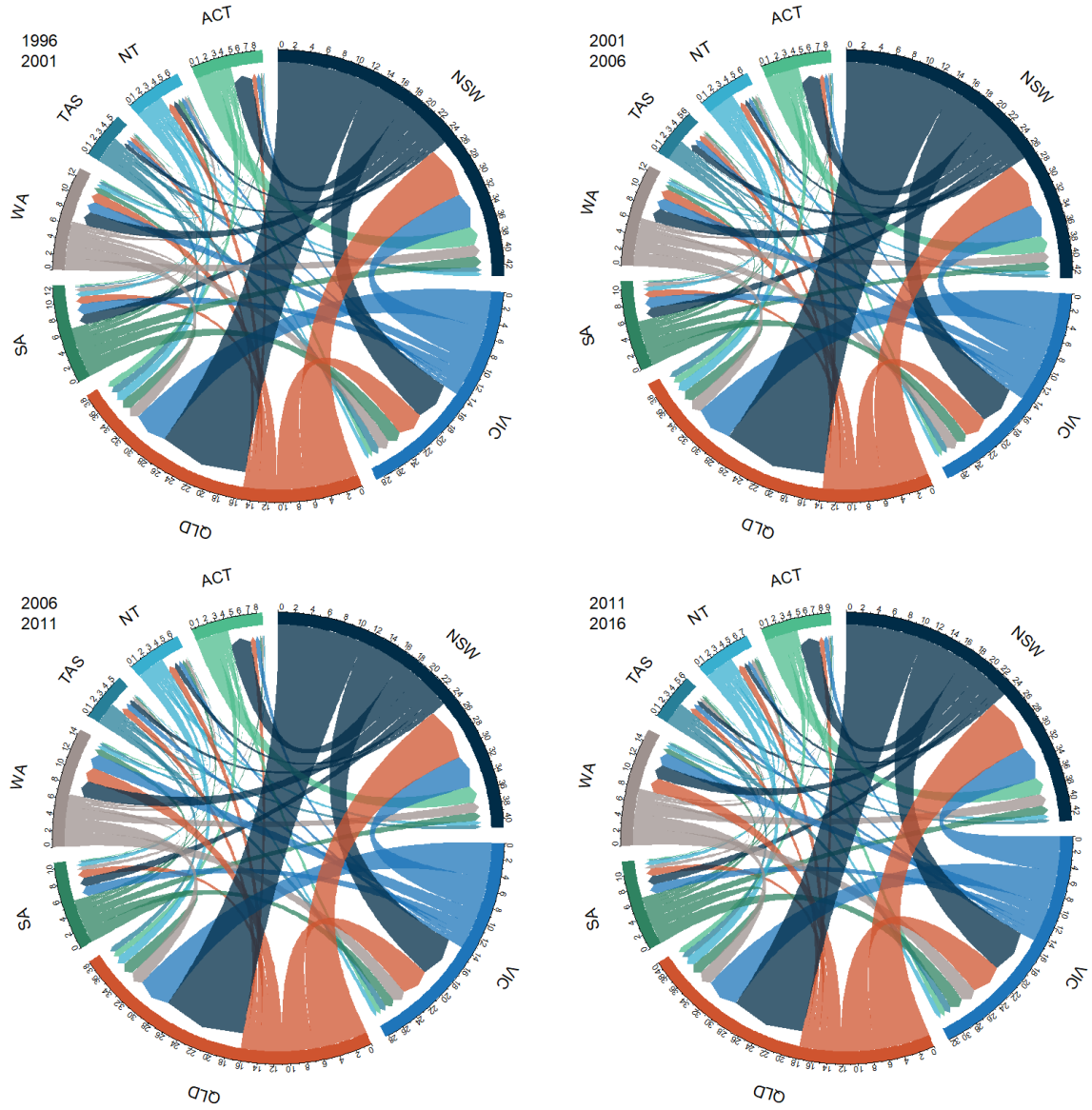
Source: ABS 2020f.

Chart 12. INTERSTATE MIGRATION FLOWS, 1976–81 TO 1991–96



Source: Australian Bureau of Statistics, Census data.

Chart 13. INTERSTATE MIGRATION FLOWS, 1996–2001 TO 2011–16



Source: Australian Bureau of Statistics, Census data.

To investigate changes in the structure of interstate origin-destination migration flows, a spatial shift-share analysis was conducted (Plane and Rogerson 1994). This technique decomposes a set of origin-destination flows into 3 components.

1. The population base component, which reflects changes in the level of out migration from destinations due to changes in the population at risk of moving. An increase in the at-risk population is associated with an increase in mobility, while a decline in population results in fewer migrants.

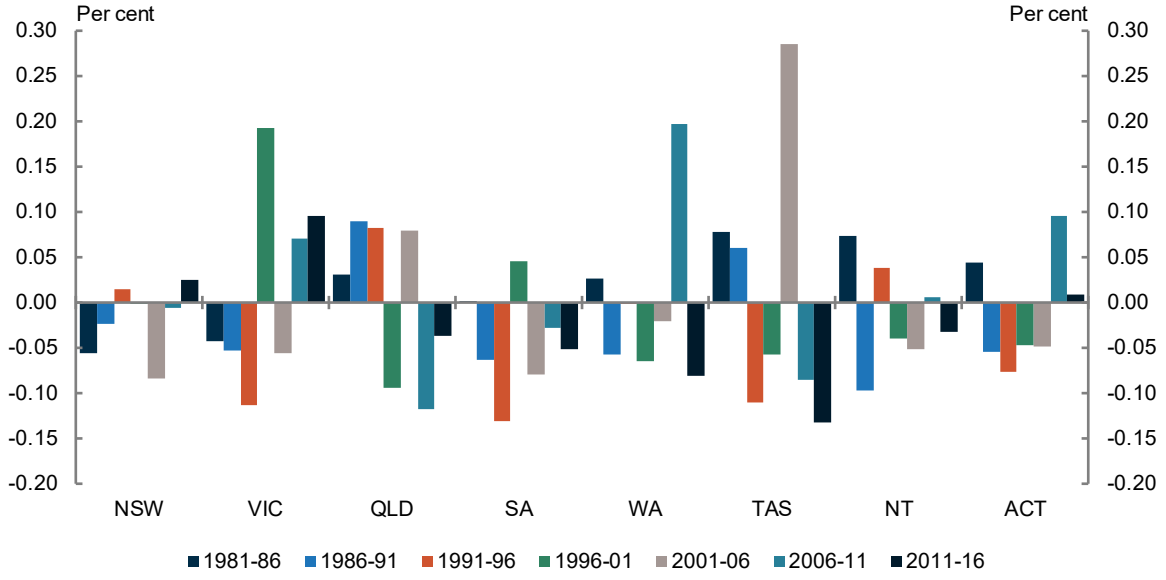
2. The mobility component, which captures how many additional or fewer migrants would be in a given migration stream in addition to the population base component due to a decline in the overall level of out migration from a region.

3. The geographic distribution component, which is the portion of the change in migration between an origin-destination pair attributable to conditions at the destination.

Results from the migration shift-share analysis reveal that the population component has led to a steady increase in the volume of interstate migration over time. This has been offset to a degree by a decline in the propensity to migrate, as captured by the mobility component, which is negative for most states and territories in most periods with exceptions including New South Wales and Victoria in 2011–16.

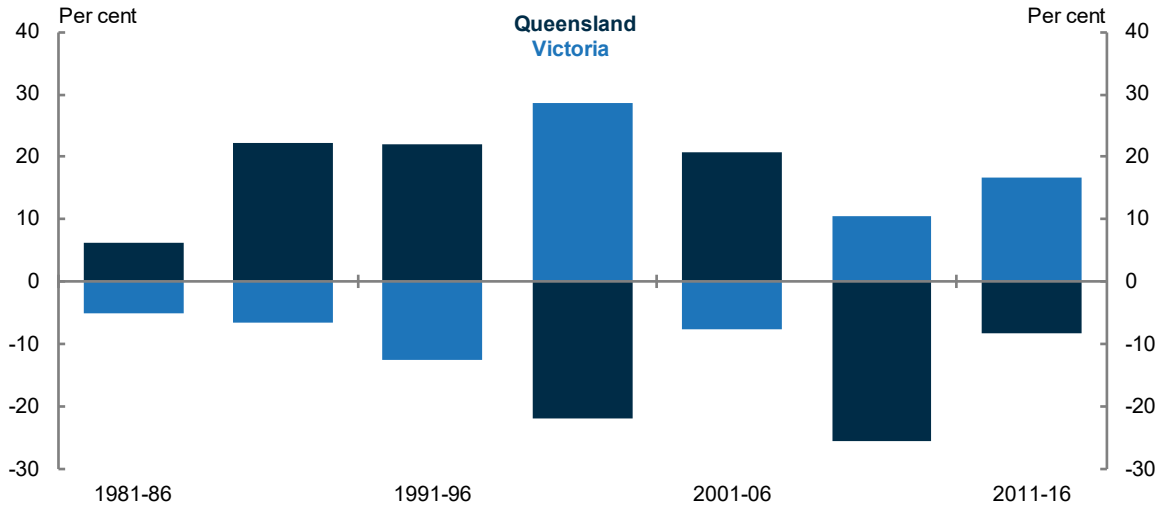
The geographic component is the most volatile. Chart 14 shows the geographic component summed for all inflows to a state and represented as a percentage of the terminal period flows. Key shifts in the migration system can be observed over the 35 years from 1976–81 to 2011–16. These include the significant decline in the geographic component of flows to Victoria in 1991–96 compared with the 5 years previous, coinciding with the Victorian recession of the early 1990s. This is followed by a rebound in 1996–2001 equivalent to almost 20 per cent of the total inflows. Tasmania experienced an increase in the geographic component equivalent to nearly 30 per cent of flows in 2001–06; levels not seen previously or since. Similarly, the geographic component of flows to Western Australia accounted for almost 20 per cent of flows in 2006–11 coincident with the mining boom that occurred at a similar time. An intriguing result of the shift-share is the reciprocity in the geographic components for Victoria and Queensland (Chart 15). When Victoria records a positive geographic component, Queensland records a negative component and vice versa. No other systemic relation exists between states and territories.

Chart 14. GEOGRAPHIC COMPONENT OF SPATIAL SHIFT-SHARE, 1976–81 TO 2011–16



Source: Author's calculations from Census data.

Chart 15. GEOGRAPHIC COMPONENT OF SPATIAL SHIFT-SHARE, VICTORIA AND QUEENSLAND, 1981–86 TO 2011–16



Source: Authors' calculations from Census data.

4.2 EXPLAINING INTERSTATE MIGRATION

To shed light on the drivers of interstate migration, in and out migration rates have been modelled as functions of a state's socio-economic conditions relative to other states. Results in Table 7 indicate that, in the long-term, all variables have a statistically significant impact on in and out migration except for the unemployment rate. However, in the short-term, the unemployment rate is statistically significant. A 10 per cent increase in a state's unemployment rate relative to other states will lead to a 0.80 per cent increase in the rate of out migration and to a 0.73 per cent decrease in the rate of in migration. The effect on the net migration rate would be a 1.53 per cent decline. In other words, the spatial patterns of migration are likely to change if state unemployment rates diverge, but only in the short-term. While this is not currently the case, it is assumed that the unemployment rate will increase proportionally more in Victoria than other states in 2020 and 2021 due to its second wave of the pandemic. For that reason, out migration from Victoria is expected to be elevated compared with other states and territories.

Table 7. REGRESSION COEFFICIENTS, IN AND OUT INTERSTATE MIGRATION RATES, 1990–2018

	In migration rate	Out migration rate
Long-term effect		
Real gross state product per capita	-0.83***	-0.25*
Unemployment rate	0.07	-0.14*
Female labour force participation	-2.50***	-0.04
Per cent of the population aged 20 to 40 years	-2.88***	3.59**
International migration rate	0.02**	0.00
Short-term effect		
Real gross state product per capita	0.15	-0.10
Unemployment rate	-0.07*	0.08**
Female labour force participation	-0.04	-0.28
Per cent of the population aged 20 to 40 years	0.64	0.46
International migration rate	0.001***	-0.01*

Level of statistical significance * p<0.05, ** is p<0.01, *** p<0.001.

Source: Gross State Product: ABS 2020d; Unemployment rate and female labour force participation: ABS 2020a; Population and international migration: ABS 2020c.

Note: Results from a Pooled Mean Group model. All explanatory variables are measured at a state level and lagged by a year. See Appendix A for further information.

Coefficients should be interpreted as follows: in the short-term, a 10 per cent increase in a state's unemployment rate relative to other states will lead to a 0.80 per cent increase in the rate of out migration and to a 0.73 per cent decrease in the rate of in migration.

The importance of the state unemployment rate is confirmed by a gravity model of bilateral interstate flows (Table 8). A 10 per cent increase in unemployment at the destination leads to a 1.5 per cent decrease in inflows. An increase in residential property prices at the origin and destination has a positive effect on the size of migration flows, although the effect is stronger at the origin. A 10 per cent increase in housing prices at the origin will increase outflows by 2.0 per cent. Conversely, a deterioration of the housing market will constrain interstate migration.

Table 8. REGRESSION COEFFICIENTS, BILATERAL INTERSTATE MIGRATION FLOWS, 2004–18

	Migration rate
Distance	-4.70**
Origin	
Population	0.85**
Real gross state product per capita	0.03
Unemployment rate	-0.02
Residential housing prices	0.20**
Female labour force participation	-0.04
Per cent of the population aged 20 to 40 years	0.62
International migration rate	-0.04**
Destination	
Population	1.03**
Real gross state product per capita	-1.72
Unemployment rate	-0.15**
Residential housing prices	0.15**
Female labour force participation	-0.27
Per cent of the population aged 20 to 40 years	-0.25
International migration rate	0.06**

Level of statistical significance * p<0.05, ** is p<0.01, *** p<0.001.

Source: Distance: Author's calculations from population weighted centroids; Gross State Product: ABS 2020d; Residential housing prices: Author's calculations from ABS 2020e and RBA 2020b; Unemployment rate and female labour force participation: ABS 2020a; Population: ABS 2020c.

Note: Results from a two-way fixed effects gravity model. All explanatory variables are measured at a state level and lagged by a year. Residential housing prices are computed as the weighted average of the real median house price and median attached dwelling prices and factor in a 25-year mortgage with the interest set at the average annual lending rate of banks for housing loans. See Appendix A for further information.

Coefficients should be interpreted as follows: A 10 per cent increase in unemployment at the destination leads to 1.5 per cent decrease in inflows.

4.3 ASSUMPTIONS

Given that there is limited evidence available to indicate major shifts in spatial patterns, only one assumption is proposed. Current spatial patterns of migration are assumed to remain broadly stable, except for Victoria, which is expected to have elevated levels of out migration compared to other states and territories. This is motivated by the stability of spatial patterns over time, even during past recessions. Results from the modelling highlight the negative effect of an increase in unemployment at the destination on the size of bilateral flows. Thus, because Victoria is expected to experience a more pronounced economic downturn due to its second wave of the pandemic and resulting activity restrictions, it is anticipated that migration out of Victoria will be elevated compared with other states and territories.

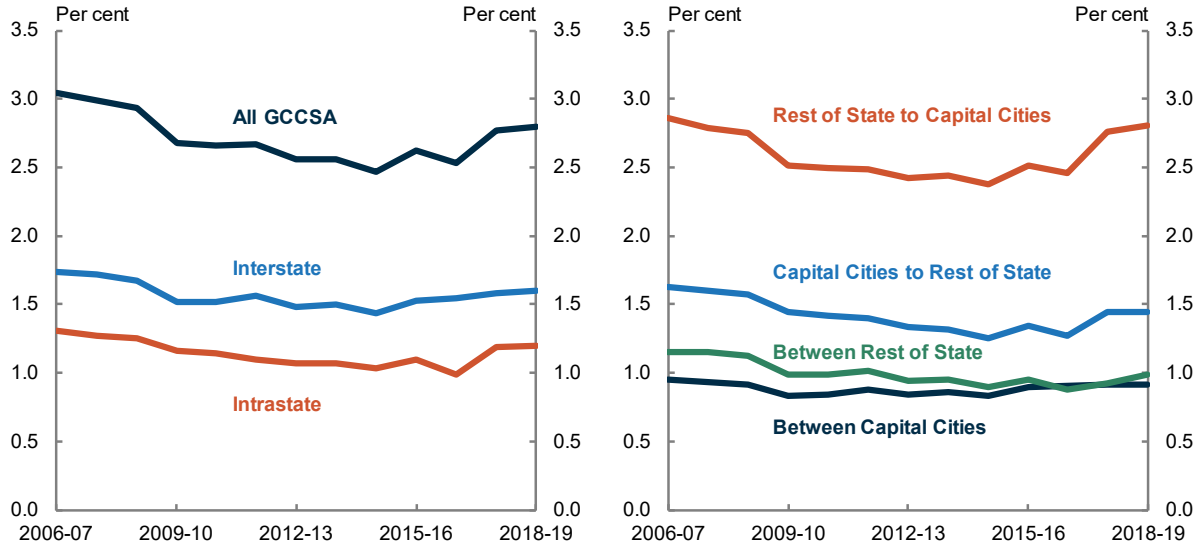
5. Migration flows between capital cities and the rest of states

5.1 Descriptive statistics

The time series available for inter-GCCSA migration is relatively short, with annual data available only for the period 2006 to 2019. The lack of an extensive time series is a constraint for the analysis. It does not permit testing the response of inter-GCCSA migration to past economic shocks other than the Global Financial Crisis, which did not have a significant effect in Australia.

Chart 16 shows inter-GCCSA migration rates split into interstate and intrastate moves. The total GCCSA rate has decreased from 3.0 per cent in 2006–07 to 2.5 per cent in 2014–15 before bouncing back to 2.8 per cent since 2018. The recent increase in inter-GCCSA migration rates has been driven by increased exchanges between GCCSAs within individual states and territories. It is also worth noting that migration rates are higher between capital cities and regional areas.

Chart 16. Internal migration rates, GCCSA, 2012–19



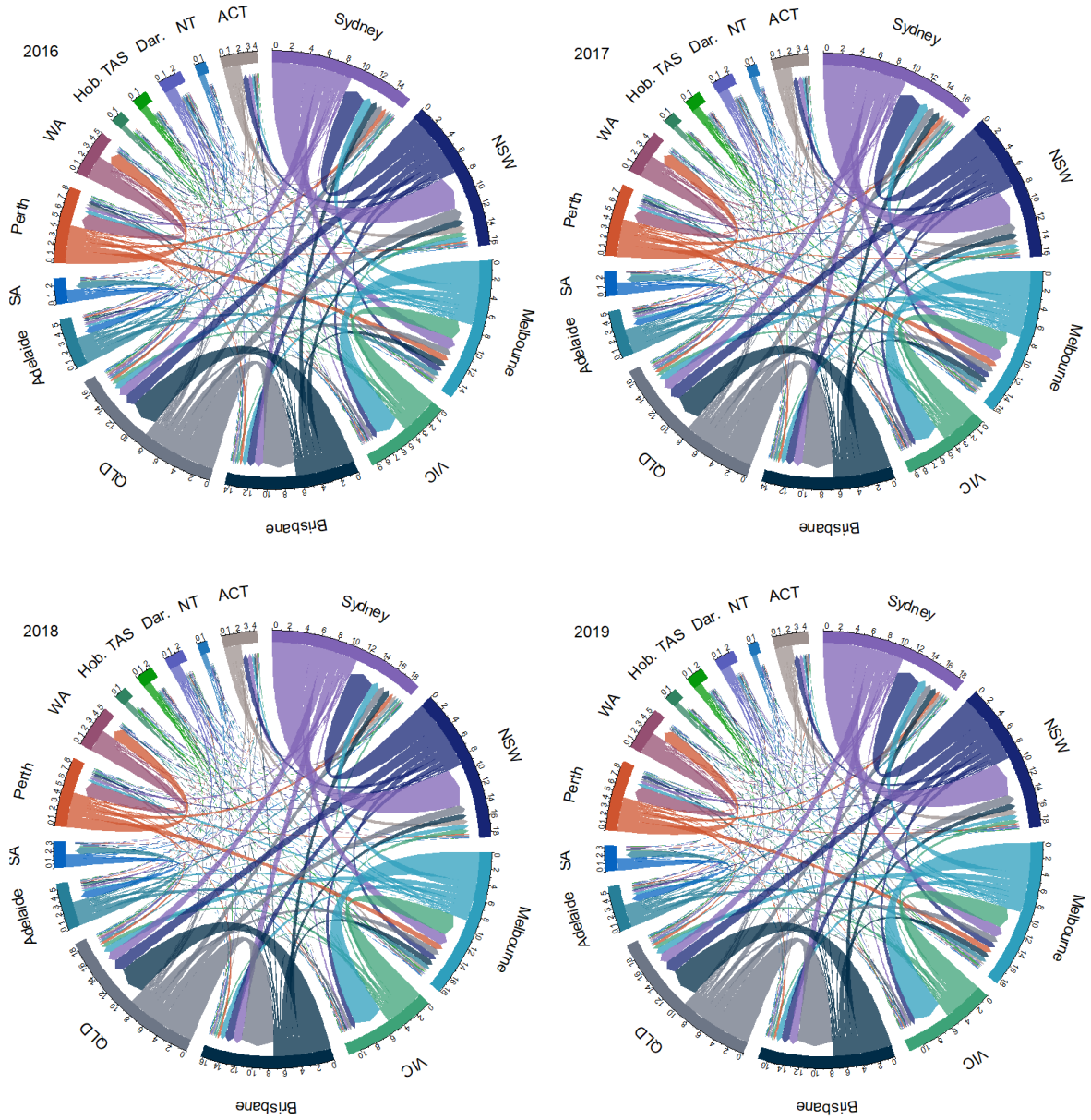
Source: Authors' calculations from Australian Bureau of Statistics unpublished data.

The bilateral GCCSA migration flows have been broadly stable over the period, so only the last 4 years are included in Chart 17. The largest exchanges are between state capital cities and their respective 'rest of states', including Greater Sydney and rest of New South Wales, Greater Melbourne and rest of Victoria and Greater Brisbane and rest of Queensland. This reflects the high degree of state and territory containment within the Australian migration system and the presence of 'distance decay' in migration flows.

Greater Sydney and Greater Melbourne consistently lose migrants to each state's respective rest of states while Greater Perth, Greater Hobart and Greater Darwin all gained migrants between 2012–19. Greater Brisbane lost migrants in 2012 and 2013 but is now a net recipient. Exchanges between Greater Adelaide and rest of South Australia have been more volatile, although the magnitude of gains and losses has been small.

GCCSA flows between states and territories are concentrated between capital cities. However, significant flows are observed into the rest of Queensland and rest of New South Wales. This is due to flows into regional cities including the Sunshine Coast and the Gold Coast (Queensland) as well as the presence of trans-border communities such as Coolangatta-Tweed Heads.

Chart 17. BILATERAL MIGRATION FLOWS, GCCSAS, 2016–19



Source: Authors' calculations from Australian Bureau of Statistics unpublished data.

5.2 EXPLAINING INTER-GCCSA FLOWS

Models of inter-GCCSA migration as a function of origin and destination socio-demographic indicators from 2013 to 2018 show that flows between capital cities and the rest of the states respond to changes in labour and housing market conditions (Table 9). More specifically, a 10 per cent increase in the unemployment rate in capital cities relative to regional areas will boost migration to regional areas by 3.6 per cent, while a 10 per cent increase in house prices in regional areas relative to capital cities will decrease migration from capital cities to regional areas by 14.6 per cent. Any growing disparities in labour market conditions between regional and metropolitan areas will therefore affect the direction of flows within states.

Table 9. REGRESSION COEFFICIENTS, INTER-GCCSA MIGRATION BY FLOW TYPE, 2013–18

	All flows	Capital city to capital city	Capital city to rest of state	Rest of state to capital city	Rest of state to rest of state
Distance	-0.21	-20.51	-0.04	1.08	-0.99
Origin					
Population	1.70**	0.88	4.90***	-2.43	6.22**
Real gross region product per capita	-2.04**	-1.10	-0.48	3.89	2.64
Unemployment rate	0.03	0.07	0.36*	0.23	-0.14
Residential housing prices	-0.07	-0.37	0.06	-0.27	1.63**
Female labour force participation	0.08	0.18	-2.99**	0.19	0.43
Per cent of the population aged 20 to 40	-1.11	2.54	5.83*	-3.14	-13.69
Destination					
Population	2.59**	4.30**	1.59	3.19*	4.74**
Real gross region product per capita	-1.66	1.83	-4.40	-0.44	-2.44
Unemployment rate	-0.24**	-0.04	-0.27	-0.16	-0.18
Residential housing prices	0.62***	1.45***	-1.46**	1.20**	-0.97
Female labour force participation	-1.26**	-1.26*	-1.02	-3.19**	-1.03
Per cent of the population aged 20 to 40	0.79	-4.40**	9.31**	0.05	4.87
Number of observations	910	280	240	240	150
R^2	0.19	0.43	0.25	0.40	0.37

Level of statistical significance * p<0.05, ** is p<0.01, *** p<0.001.

Source: Distance: Author's calculations from population weighted centroids; Residential housing prices: Author's calculations from ABS 2020e and RBA 2020b; Unemployment rate and female labour force participation: ABS 2020a; Population: ABS 2020c.

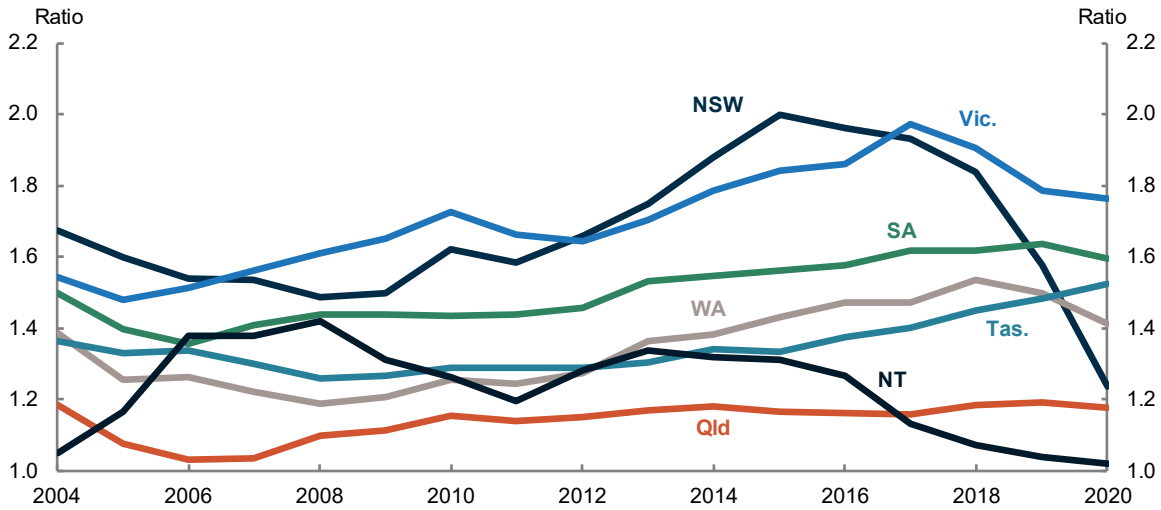
Note: Results from a two-way fixed effects gravity model. All explanatory variables are measured at a state level and lagged by a year. Residential housing prices are computed as the weighted average of the real median house price and median attached dwelling prices and factor in a 25-year mortgage with the interest set at the average annual lending rate of banks for housing loans. See Appendix A for further information.

Coefficients should be interpreted as follows: a 1 per cent increase in the unemployment rate in capital cities relative to regional areas will boost migration to the rest of the state (regional areas) by 0.36 per cent.

The effect of housing prices on migration means that the attractiveness of regional areas may diminish in the future if housing prices in regional areas increase proportionally more than in capital cities. Trend analysis of housing prices (Chart 18) indicates that the ratio of housing prices in capital cities to rest of states has diminished in New South Wales and the Northern Territory, but has tended to increase in other states and territories over the last decade. The decline in price differentials in New South Wales is the result of housing prices increasing faster in regional areas than in Sydney. As a result, Victoria took over New South Wales as the

state with the highest price ratio in 2017, which means that the ratio of housing prices in Greater Melbourne to Rest of Victoria have since been proportionally higher than in other states and territories.

Chart 18. RESIDENTIAL PROPERTY PRICES BY STATES, RATIO OF HOUSING PRICES IN CAPITAL CITIES TO REST OF STATES



Note: Residential property prices are the weighted average of median established house transfers price and attached dwelling transfers price.

Source: Authors' calculations from ABS 2020e. Prices were deflated using ABS 2020g.

5.3 COVID-19 RELATED DISRUPTIONS

The results presented in preceding sections draw on historical data to identify the drivers of internal migration. They do not take into account disruptions that may have been caused by the COVID-19 pandemic other than its effects on GDP. This section discusses 2 possible disrupters to existing internal migration processes — young adults returning to the parental home and teleworking — and the implications for future migration trends.

RETURN TO THE PARENTAL HOME

A possible offset to the expected decline in internal migration, at least in the short-term, is an increase in 'return' migration (World Bank 2020). To gauge the societal effects of the COVID-19 pandemic, the Australian Bureau of Statistics conducted the longitudinal Household Impacts of COVID-19 survey. Results show that, as of May 2020, 3.7 per cent of Australian households had hosted someone temporarily because of the pandemic. Of these, 37.3 per cent were their adult children. This corresponds to about 268,000 adult children Australia-wide. While responses related to motivations suggest that most returns are temporary, 14 per cent were for financial reasons, which suggests these numbers may increase if the economic situation deteriorates. This is taken into account in the modelling.

Such living arrangements form part of a longer-term trend of young adults returning to the parental home to accommodate uncertainty in the labour market (Stone, Berrington and Falkingham 2014). This is likely to be exacerbated in the short-term by rising youth unemployment. As of June 2020, the unemployment rate for people aged 18 to 24 years old was 16.4 per cent, which is 9 percentage points higher than for the general population and the highest level recorded since March 1997 (ABS 2020). In addition to experiencing more difficulties in accessing employment, young adults also experience a greater decline in the economic return from migration during recessions compared to older workers (Sacks and Wozniack 2011). Young adults are therefore less likely to migrate to a new location during recessions than the general population. This downward pressure will most likely negate the effect of the increasing rate of young adults returning home and have a limited effect on migration age patterns in the short-to-medium term.

TELEWORKING AND MIGRATION TO REGIONAL AREAS

There has been speculation in the media that an increase in working from home arrangements will lead to greater migration to rural and regional Australia. According to the Australian Bureau of Statistics Household Impacts of COVID-19 survey (ABS 2020b) conducted in July 2020, 24.8 per cent of respondents expected to continue to work or study from home under existing COVID-19 pandemic restrictions compared to 46.0 per cent at the end of April. There is theoretical support that suggests that teleworking and long-distance commuting can be substitutes for migration (Cooke and Shuttleworth 2017), and also increase residential choice due to a greater acceptance of longer commuting distances. Direct evidence of the links between telecommuting and migration in Australia remain limited. Work undertaken in South Korea suggests that telecommuters are more likely to live in peri-urban areas, however, the study noted that firms with telecommuting arrangements are more likely to be located on the periphery of metropolitan areas, leading to a lower-than-average commuting times (Kim, Mokhtarian and Ahn 2012). In the Netherlands, working from home leads to an average 5 per cent increase in commuting times (de Vos, Meijers and van Ham 2018), but remote work does not increase the probability of residential relocation (Muhammad et al. 2007).

While there is a lack of direct evidence for the relationship between remote work and migration in Australia, there is some anecdotal evidence that the widespread working from home arrangements prompted by the COVID-19 pandemic may trigger residential relocations. Evidence includes data from Australian national property search website, realestate.com.au, which showed that property search activity for regional areas increased during the pandemic (Barrett 2020). In addition, the removalist website Muval indicated an increase in activity of individuals looking to leave Sydney and Melbourne for Queensland (Masters 2020). Whether these search behaviours translate to migration is difficult to ascertain.

5.4 SCENARIO ASSUMPTIONS

Inter-GCCSA migration can be divided into 2 components: within and between state moves. For the latter, it is assumed that the level of interstate migration will follow the same trend as the headline net interstate migration assumptions (Table 1). However, migration between capital cities and the rest of states (within the same state) is not expected to be affected to the same extent as interstate migration. The basis for this assumption is threefold:

- Firstly, COVID-19 hotspots have constrained intrastate migration to a lesser extent and for shorter periods than interstate movement which has been affected by extended state and territory border closures. Travel restrictions may reduce movement out of the Greater Melbourne region in 2020, however, this is likely to be offset by an increased attractiveness of regional areas once restrictions are eased.
- Secondly, labour market conditions, as measured by the unemployment rate, were stronger outside of capital cities in all states and territories, except Queensland and Tasmania.
- Thirdly, the combined effect of young adults returning home as well as an increase in teleworking may support greater migration to regional Australia.

These conditions lead to a single proposed scenario where the migration level is held constant but the net pattern of intrastate inter-Greater Capital Cities and Statistical Area (GCCSA) migration shifts by 5 per cent in favour of regional areas in each state in 2020–21, before returning to the long-term average in 2023–24. The exception is in the Northern Territory where the pattern is assumed to remain stable due to the Territory's settlement system and demography. This scenario is supported by results from the inter-GCCSA migration flow modelling, which showed that increased unemployment in capital cities boosts migration to regional areas.

6. Migration age patterns

6.1 Describing migration age patterns

Australia's internal migration follows a well-established pattern of peaking at young adult ages and declining thereafter, which aligns with trends in other countries (Bernard et al. 2014, Rogers and Castro 1981). This pattern has persisted over 20 years for males and females (Chart 19). However, the age at which migration peaks has been progressively postponed. Analysis of in and out migration intensities (Chart 20) shows a delay in the age at peak migration of 1 to 2 years depending on the state and territory. This shift has been accompanied by lower migration at the peak, particularly after 2008, which indicates dispersion of migration across a broader age range. This trend is consistent with observations in other countries (Bernard and Pelikh 2019), although it is particularly pronounced for male migration into Western Australia.

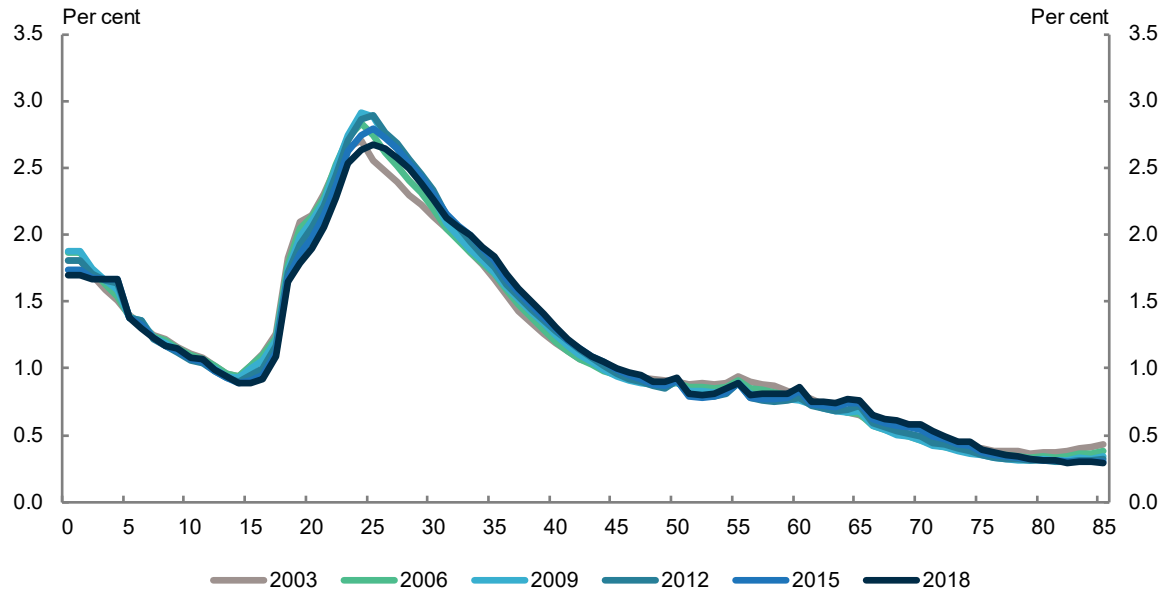
In the following sections, descriptive analysis of migration age patterns is presented at the Australia, state and territory, and GCCSA levels. There are 2 main measures used for the analysis — the intensity at peak migration and the age at peak migration — which have been shown to effectively summarise migration patterns (Bernard, Bell and Charles-Edwards 2014). The intensity at peak migration gauges the extent to which migration is concentrated at young adult ages, while the age at peak migration indicates how early in life migration tends to occur.

6.2 Australia

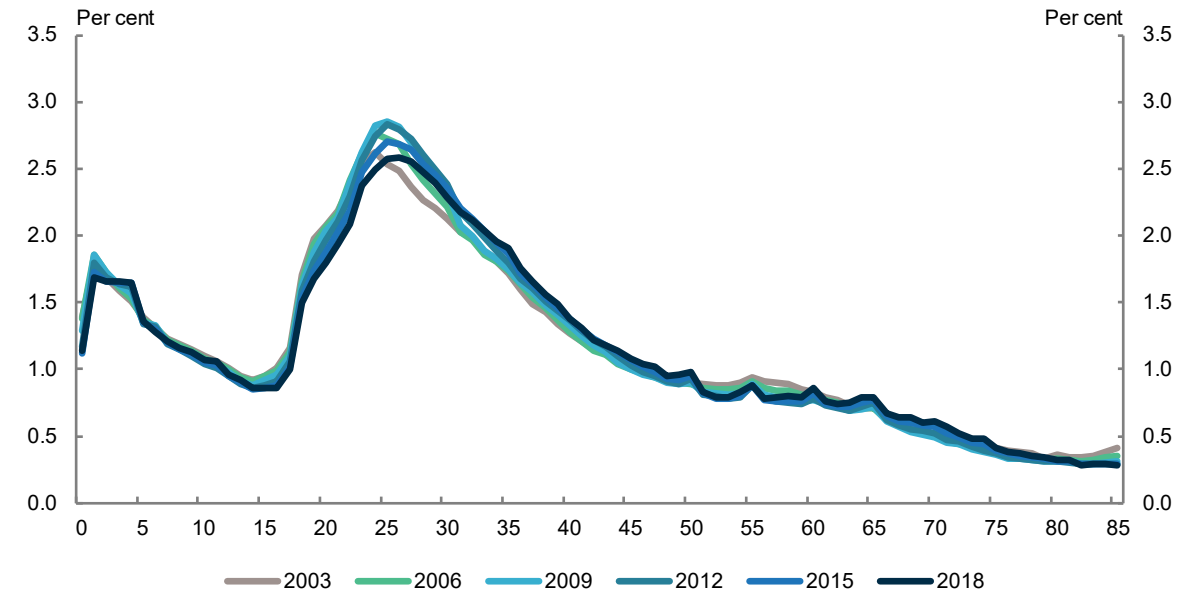
For Australia, age-specific migration intensities were calculated for each year between 2001 and 2018 by sex (persons, males, females) and for single years of age up to 85 and over. To compare age-specific migration intensities across years independently from changes in the overall level of migration, age-specific migration intensities were normalised to unity. For each year, age and intensity at peak migration were calculated. For males and females combined, the age of peak migration intensity was 24 at the beginning of the period and shifted to 25 from 2011 onwards. For males, this shift happened in 2008 and for females, the age at peak migration shifted from 23 to 24 in 2002. Australia-wide internal migration age patterns are relatively stable, but with a diminishing student peak. The ranges of peak in migration intensities decreased over time, whereas for out migration they stayed relatively constant.

Chart 19. Age-specific internal migration intensities for Australia between 2001 and 2018

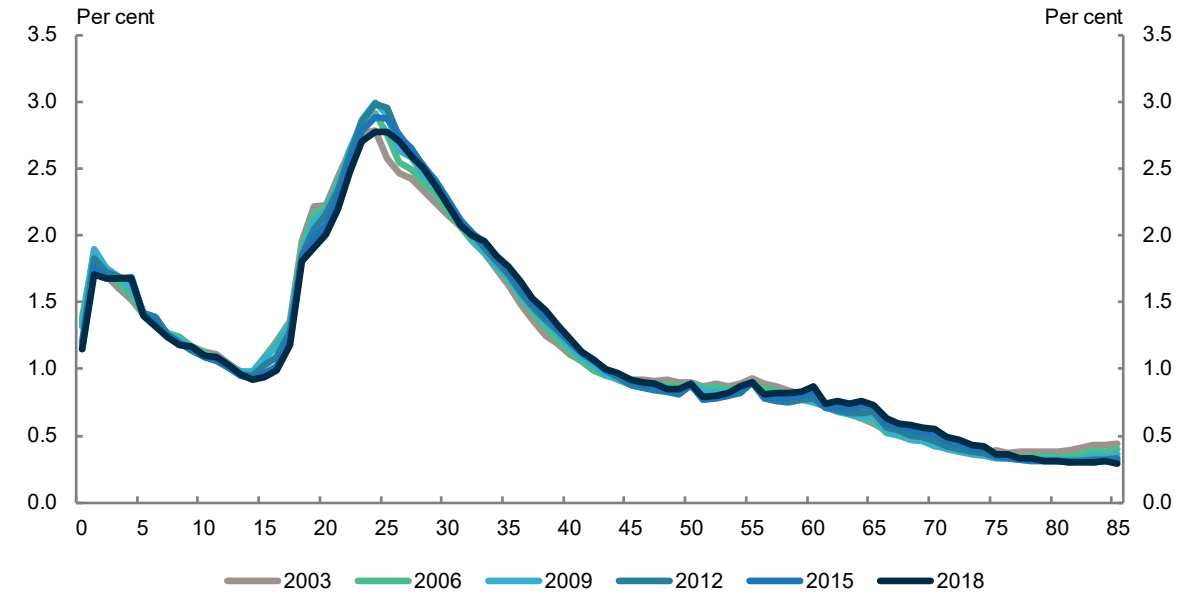
Persons



MALES



FEMALES



Source: Authors' calculations from Australian Bureau of Statistics unpublished data.

6.3 STATES AND TERRITORIES

For each state and territory, age-specific migration intensities for in migration and out migration were calculated for each year between 2001 and 2018 by person and single year of age up to age 85 and over. Data were smoothed and normalised to unity to allow comparison of data across time and geographic regions. The following charts summarise the findings and depict the changes in the age at peak migration over time (Chart 20) and the change in intensity at peak age (Chart 21). The general trend observed for in and out migration is an increase in the age of peak intensities by one or 2 years.

Overall, internal migration age patterns for states and territories are relatively stable. The main findings are:

1. most states and territories follow similar age patterns to Australia over time

2. the age at peak migration shifted only slightly over time and not more than one or 2 years with few exceptions (Chart 20)

3. the age at peak in migration for the Australian Capital Territory is variable between 18 and 24 years, with the territory having the most prominent and persistent double peak (students and young adults)

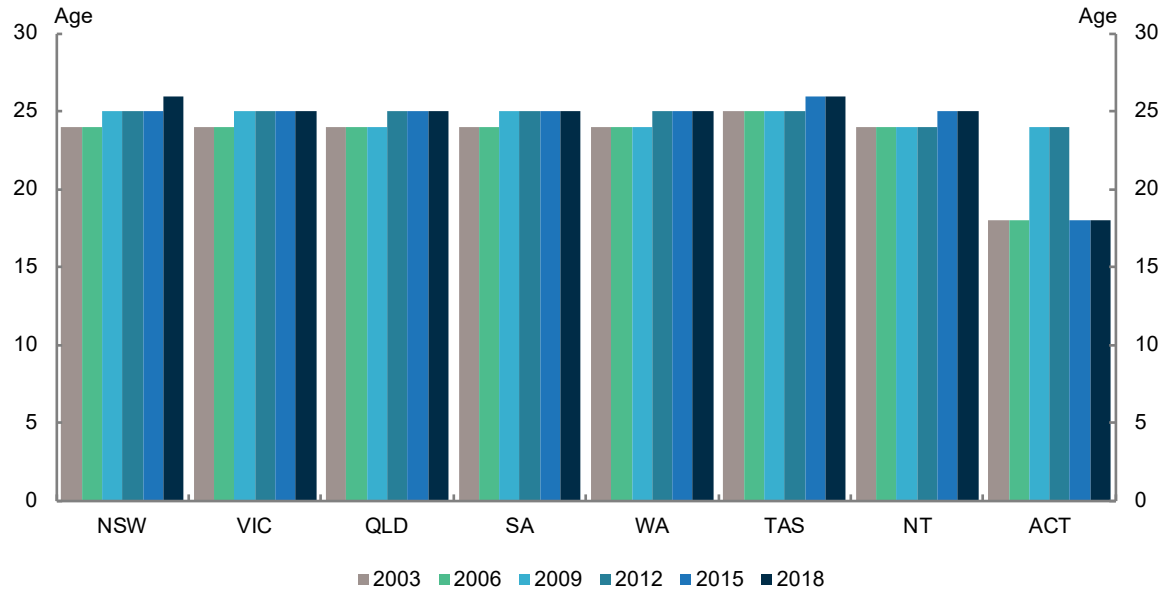
4. the age at peak out migration for the Northern Territory is higher in more recent years

5. the range of peak in migration intensities decreased over time, whereas out migration stayed relatively constant

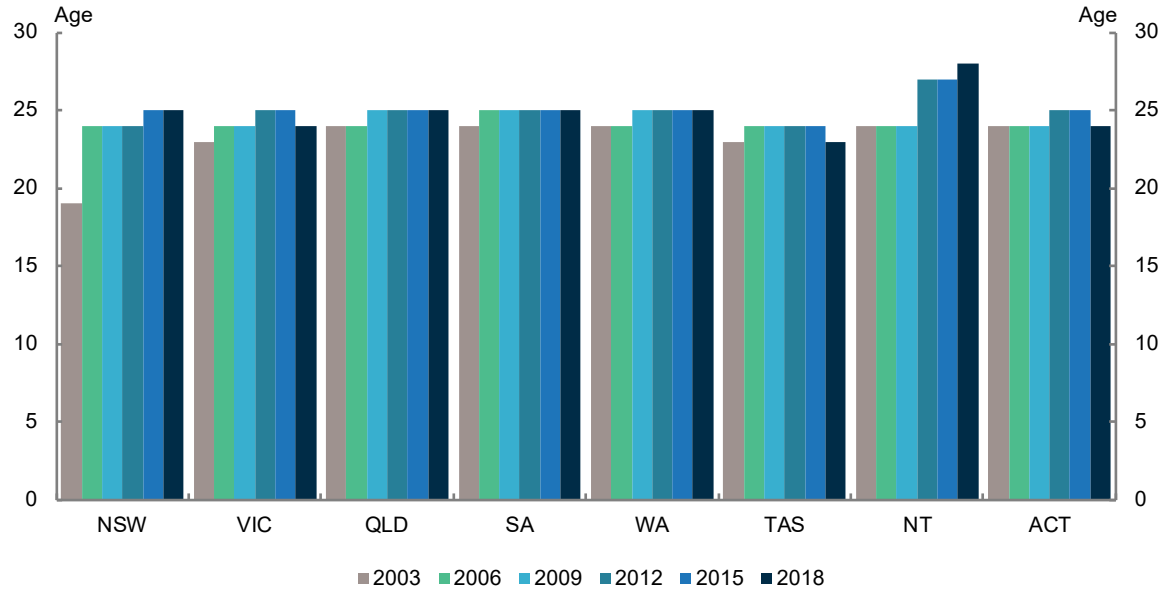
6. for in and out migration, the ranks areas held varied over time.

Chart 20. AGE AT PEAK, OUT AND IN MIGRATION, STATE AND TERRITORY, 2001–18, PERSONS

IN MIGRATION

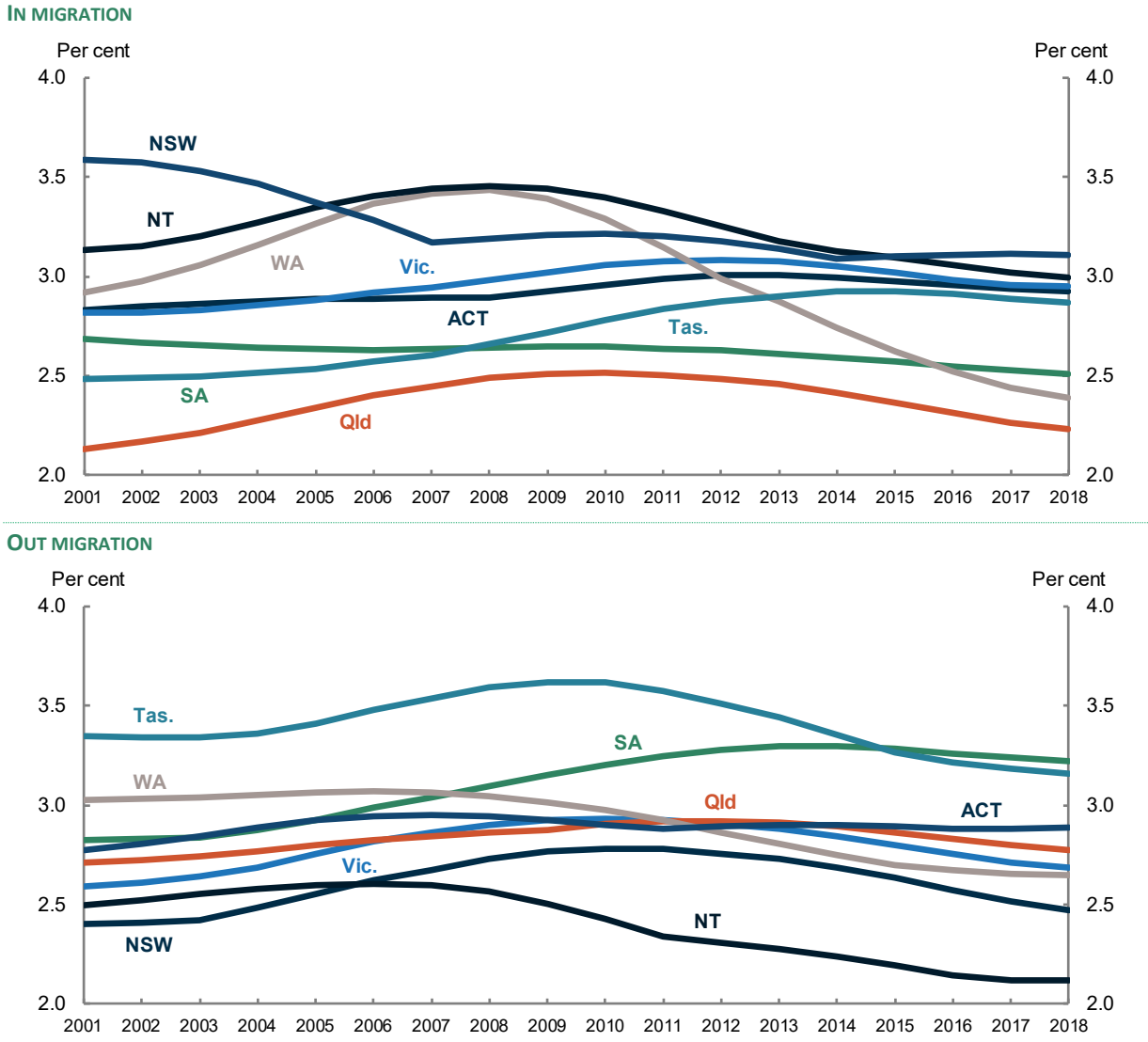


OUT MIGRATION



Source: Authors' calculations from Australian Bureau of Statistics unpublished data.

Chart 21. MIGRATION INTENSITY AT PEAK (NORMALISED) BETWEEN 2001 AND 2018, STATES AND TERRITORIES



Source: Authors' calculations from Australian Bureau of Statistics unpublished data.

6.4 GREATER CAPITAL CITY STATISTICAL AREAS

Migration age profiles for GCCSAs were calculated for single years of age and sex for each year between 2012 and 2019. The underlying data used were Regional Internal Migration Estimates (RIME) and Estimated Resident Population from the Australian Bureau of Statistics.

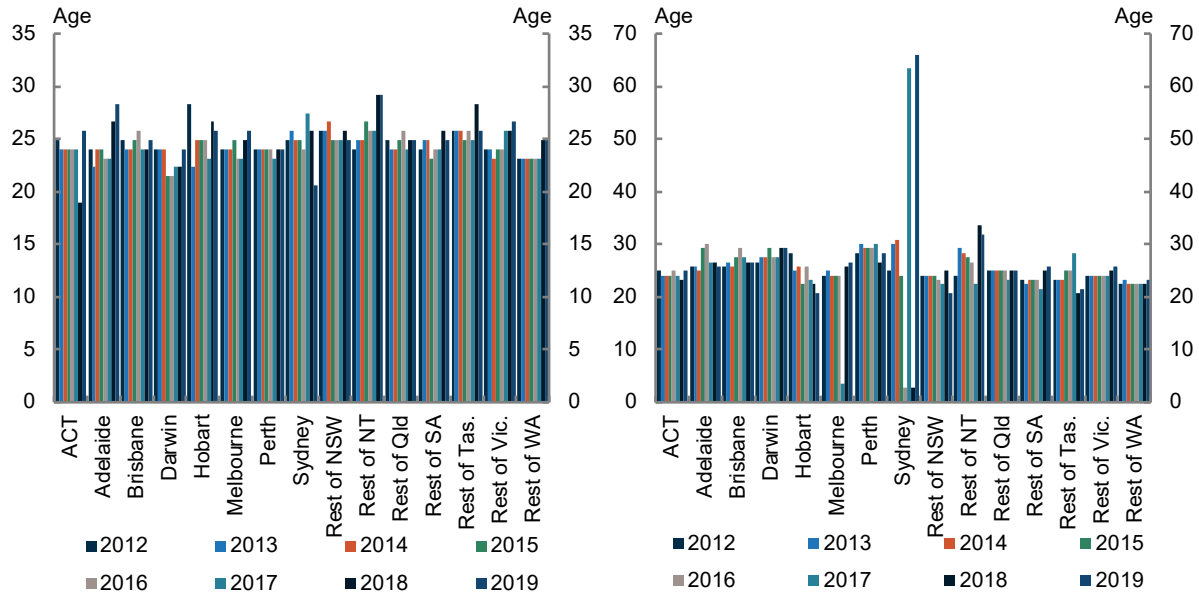
Similar to interstate migration, migration age profiles for GCCSAs were relatively stable between 2012 and 2019. However, out migration age profiles for Sydney and Melbourne were less variable than other regions. The in migration age profile for Sydney in 2016 shows an unusual spike around age 70, however, this may be a data anomaly. Also similar to interstate migration, the intensity at peak migration for GCCSAs generally declined over time.

Due to small numbers, in some areas the age at peak migration is highly volatile and age profiles are less robust. For this reason, Census migration age profiles were compared with RIME age profiles (see Appendix B). For GCCSAs, Census migration age profiles are preferred as they better depict the known trends of migration from regional areas to metropolitan areas at university student ages.

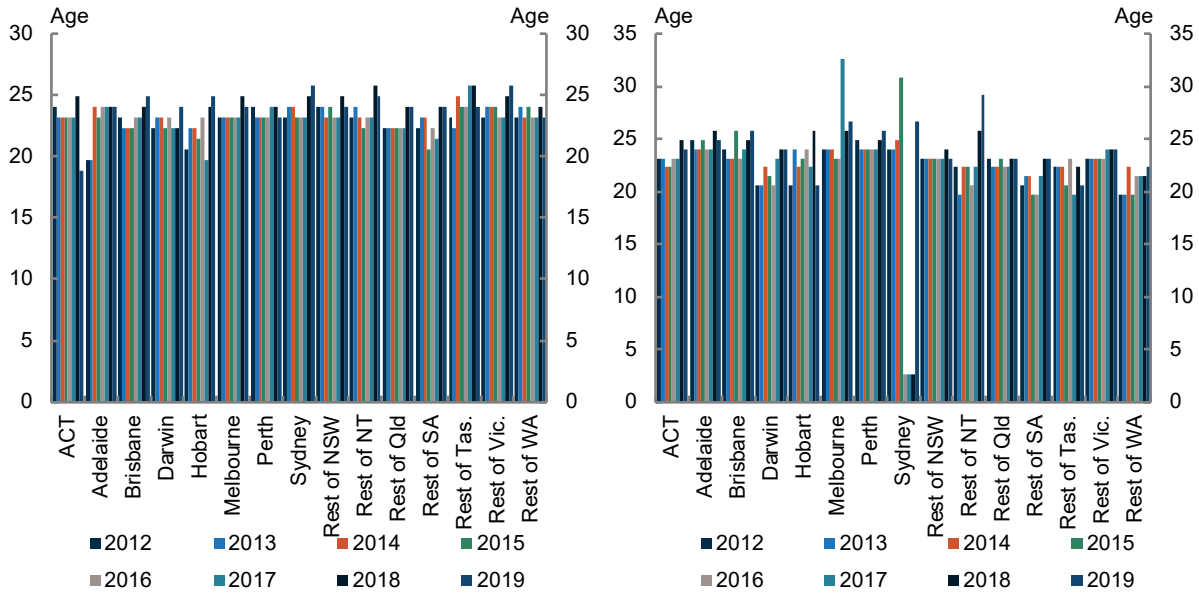
Migration age patterns of 'Other Territories' were not analysed in detail due to small numbers. The migration age profile for 'Other Territories' is assumed to be the average of age-specific migration rates for all GCCSAs.

Chart 22. AGE AT PEAK MIGRATION, GCCSAS 2012 TO 2019, BY IN MIGRATION (LHS) AND OUT MIGRATION (RHS)

MALES



FEMALES



Source: Authors' calculations from Australian Bureau of Statistics unpublished RIME data.

6.5 Scenario assumptions

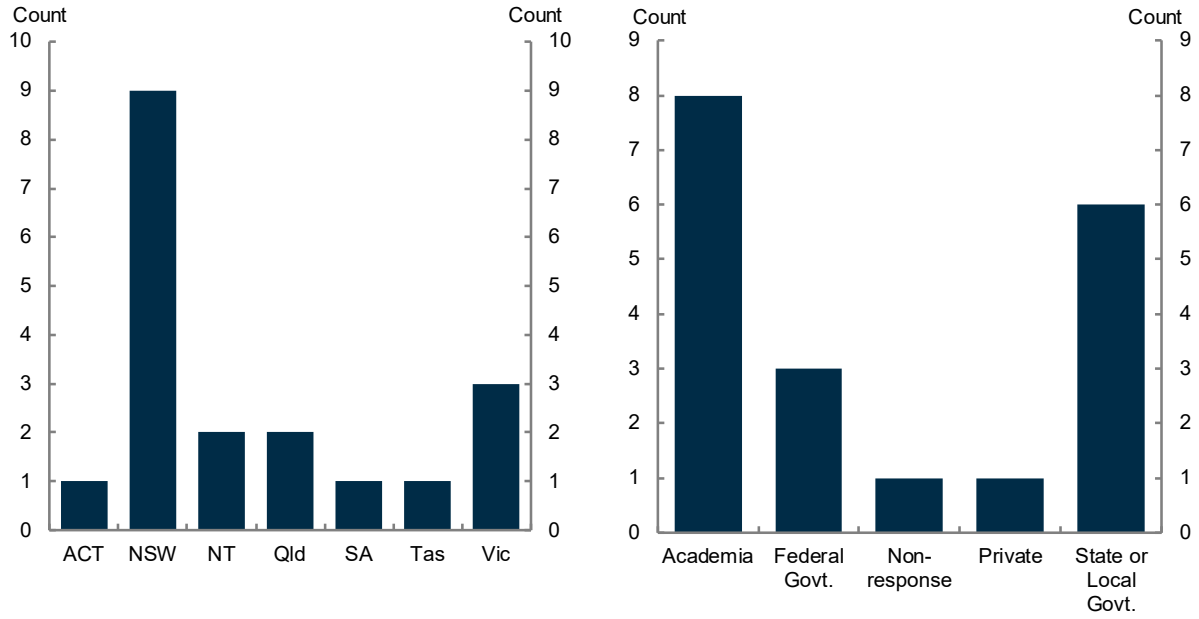
Shifts in migration age patterns are slow because they reflect long-term changes in the age structure of the life-course, such as leaving the parental home. For that reason, a single assumption is proposed for migration age patterns. Migration age patterns for 2019–20 are assumed to be the average of the last decade. The age at peak migration is assumed to gradually increase by one year over the next 20 years, and then increase by another year by 2080.

Some jurisdictions record 2 peaks of migration by age: one student peak and one young adult peak. As the average ages for secondary school completion and entry into tertiary education are expected to remain stable, the student peak that is observed in migration age profiles for some jurisdictions should be kept at a constant age. For 'Other Territories,' an averaged age profile is assumed.

7. Expert opinion survey

Drawing on findings from the descriptive analysis and modelling outlined in previous sections, a range of scenarios were developed and then tested in an online expert opinion survey. The survey was conducted between 15 and 18 September 2020. Of the 19 respondents to the survey, 10 were from New South Wales, and 3 or less were from each of the states and territories (Chart 23). Half the respondents were in academia, with the remainder of respondents mostly from Australian, state, territory and local government. While the sample size is small and the results should be considered cautiously, they provide insights into Australian expert views of the effects of the COVID-19 pandemic on internal migration.

Chart 23. Profile of survey respondents, counts



While more than 70 per cent of the respondents expected a decline in the level of interstate migration within the next 12 months, the anticipated drop was limited, with 11 of 19 respondents opting for Scenario 1 (5 to 14 per cent decline) or Scenario 2 (15 to 29 per cent decline). Chart 24 shows that only 3 respondents expected a decline greater than 30 per cent. Factors expected to exert a downward pressure on interstate migration were border closures, quarantine and the deterioration of national economic conditions, as well as diverging economic performance of states and territories. Ongoing changes in property prices were expected to have a limited impact on the level of interstate migration in the next 12 months.

Chart 24. INTERSTATE MIGRATION LEVEL: MOST LIKELY SCENARIO OVER THE NEXT 12 MONTHS, COUNTS

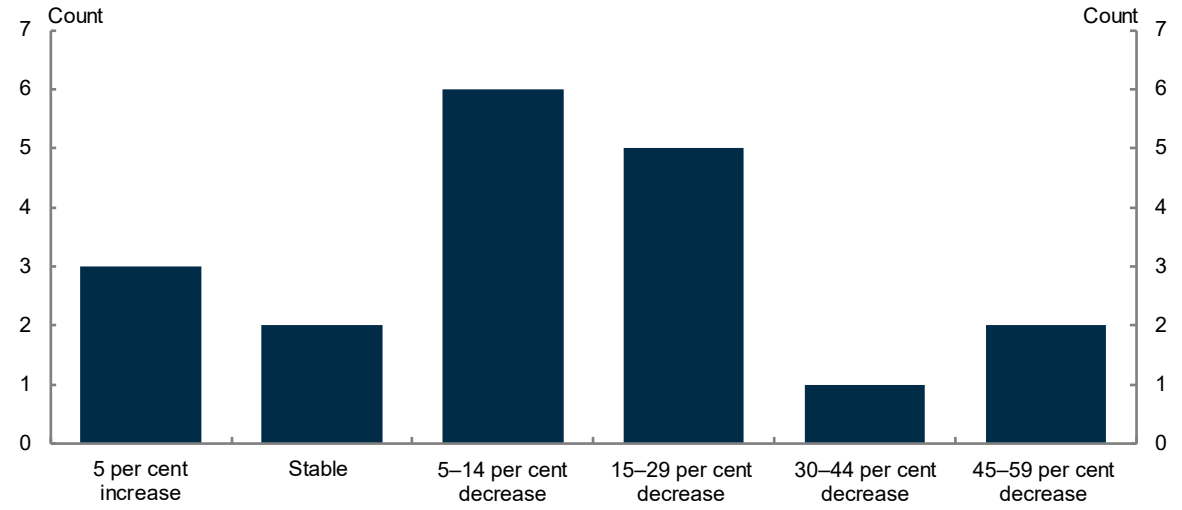
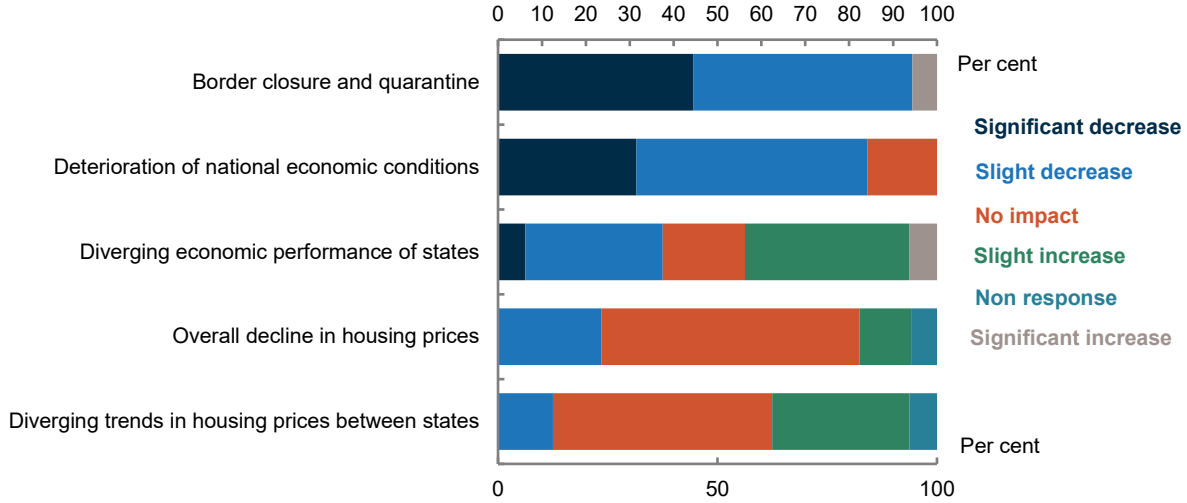


Chart 25. FACTORS LIKELY TO AFFECT THE LEVEL OF INTERSTATE MIGRATION IN THE NEXT 12 MONTHS



At a sub-state level, the share of respondents expecting migration flows to regional areas is similar to those anticipating stable spatial patterns. Only 10 per cent expected a change in favour of metropolitan areas. Views on changes in the level of migration at a sub-state level were mixed, although the majority of respondents expected a stable level or a slight increase (Chart 26). These views were based on the anticipation that teleworking arrangements will slightly stimulate migration between metropolitan and regional areas, followed by diverging trends in housing and labour markets (Chart 27). Localised COVID-19 hotspots were not expected to have any effect.

While the survey respondents agree on the disruptive effect of the COVID-19 pandemic and the resulting economic recession, most respondents anticipate a moderate decrease in internal migration and a limited distortion of existing spatial patterns. Collectively, these findings align with Scenarios 1 and 2. Limited support was found for a more severe scenario.

Chart 26. INTRASTATE MIGRATION LEVEL: MOST LIKELY SCENARIO OVER THE NEXT 12 MONTHS, COUNTS

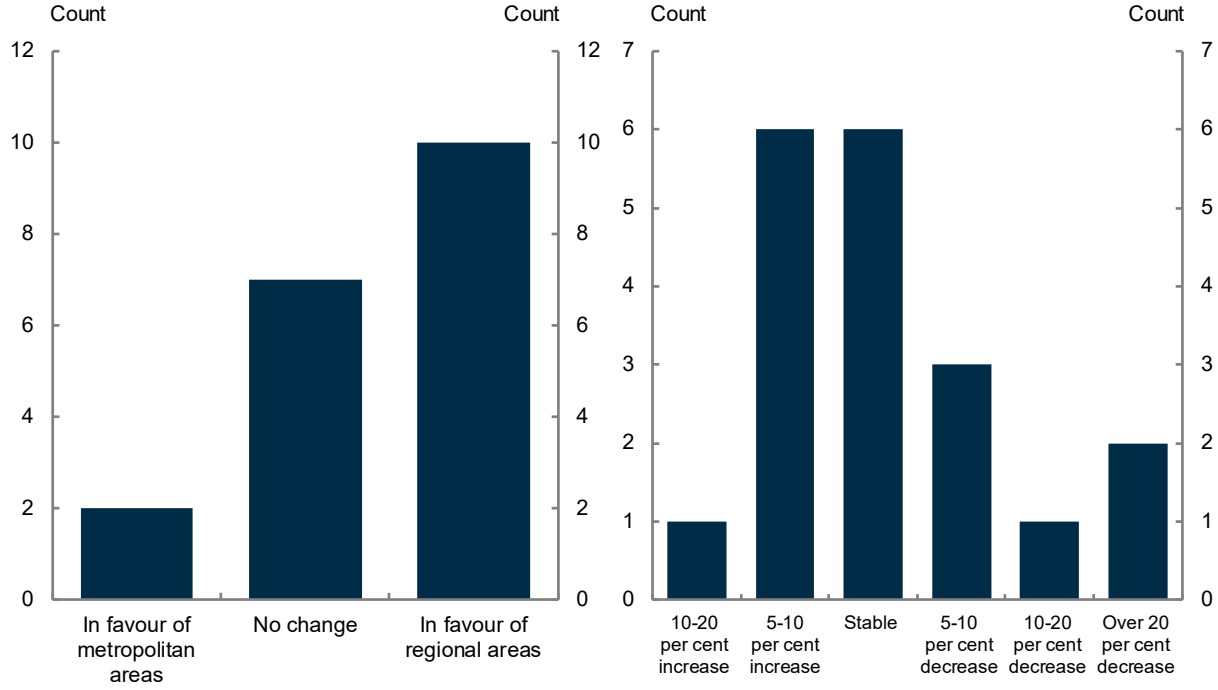
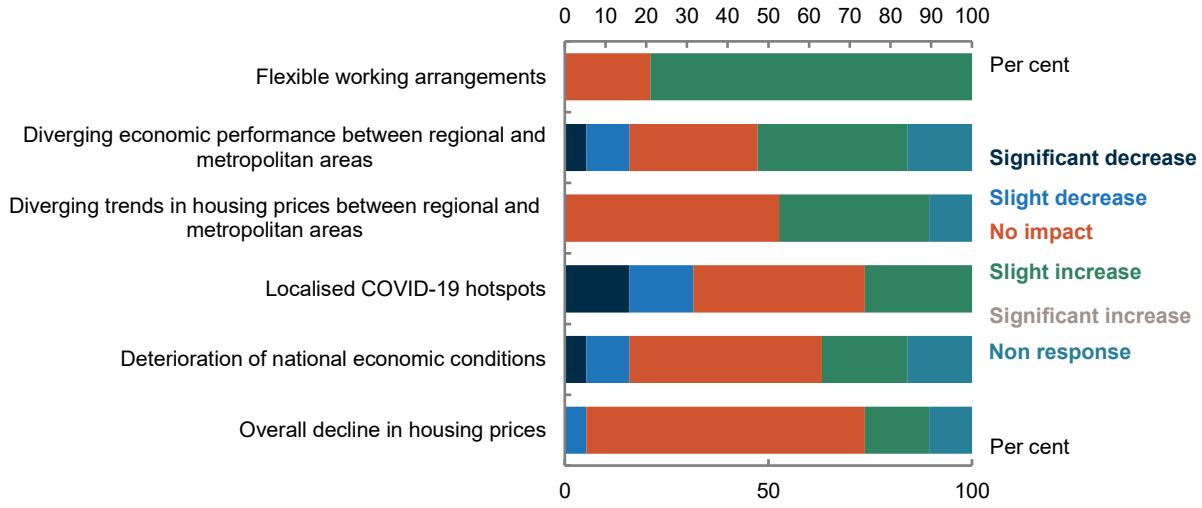


Chart 27. INTRASTATE MIGRATION LEVEL: MOST LIKELY SCENARIO OVER THE NEXT 12 MONTHS, COUNTS



8. Conclusion

8.1 Summary of findings

Following the onset of the COVID-19 pandemic, Australia entered a recession in June 2020 after 28 years of uninterrupted economic growth. The pandemic and associated economic conditions have raised questions about internal migration, which is a significant contributor to the reallocation of skills between regions and to the realisation of the needs and aspirations of individuals. Given Australia is accustomed to high levels of internal migration and prolonged periods of economic growth, the effect of economic downturns on migration has received limited attention to date. This report explores historical trends and drivers of internal migration and recognises that population movement is driven by economic motives as well as considerations such as family reasons, even for long-distance migration. This series of statistical analyses was coupled with findings from an expert opinion survey to formulate migration scenarios.

In line with evidence from other OECD countries, the results presented in this report demonstrate the effect of economic conditions on the level of interstate migration; GDP per capita at a national level, and relative unemployment rates at a state and territory level. These findings suggest that the level of interstate migration will broadly follow economic trends and decline during 2019–20 and 2020–21. The downward effect of deteriorating economic conditions is, however, compounded by state and territory border closures and quarantine requirements. Therefore, the decline in interstate migration is likely to be more pronounced than in previous recessions.

Considering the expected decline in interstate migration, an important question is whether moves will be foregone or delayed. Delayed moves would lead to a post-recession migration rebound, as observed in past recessions. Findings indicate that the more severe the economic downturn, the more likely moves will be foregone. Another important consideration is the possibility of diverging economic performance of states and territories which could potentially alter the spatial patterns of interstate migration.

Building on these results, 2 main scenarios were developed, which differ in the extent of the decline in the rate of interstate migration. A more severe scenario that assumed a dramatic drop of 60 per cent in the internal migration rate for 2020–21 was tested and deemed unlikely by the expert opinion survey. Scenario 1 and Scenario 2 anticipated a drop of 15 and 30 per cent, respectively, and were almost equally supported by the expert opinion survey. In line with previous recessions, spatial patterns of interstate migration are not expected to be significantly altered by the COVID-19 pandemic. The exception is for Victoria, where outflows are assumed to increase relative to other states and territories as a consequence of the activity restrictions and economic effects associated with its second wave of the pandemic.

It is expected that intrastate migration between capital cities and the rest of states will not be affected to the same extent as interstate migration because of the combination of favourable unemployment rates outside capital cities and the absence of restrictions on intrastate movement in most states and territories. Coupled with the significant share of young adults returning to the parental home and increased teleworking, this leads to a single scenario. The level of internal migration is assumed to be constant while the net pattern of intrastate inter-GCCSA migration is assumed to shift by 5 per cent in favour of regional areas in all states in 2020–21.

8.2 Next steps

Time-series modelling of internal migration presented in this report has shown that interstate migration responds to changes in macroeconomic conditions. Thus, to inform and update population projections and assumptions, it is recommended economic indicators such as GDP per capita and state and territory unemployment rates are closely monitored. These indicators are released quarterly and monthly, respectively,

and are useful indicators in the absence of current data on internal migration. Modelling at a sub-state level suggests migration flows between capital cities and regional areas respond to changes in labour and housing market conditions. Regularly monitoring indicators at this spatial scale provides guidance on the likely changes in migration, ahead of the release of migration data, which is significantly lagged. According to the expert opinion survey, the normalisation of working from home is expected to result in a slight increase in migration from metropolitan to regional areas, indicators of which should also be monitored. This trend is likely to be more pronounced in states like New South Wales and Victoria where regional areas were already recording net population gains before the COVID-19 pandemic.

While age patterns in migration have been broadly stable, a progressive but limited postponement of the age at which migration peaks was noted. This is caused by a delay in typical life transitions such as labour market entry and household and family formation. It remains to be seen whether this long-term trend will be altered by the increasing number of young adults returning to the parental home in the wake of the COVID-19 pandemic and recession. Evidence is limited, but this emerging trend should also be monitored as it has broad-ranging societal implications.

REFERENCES

ABS 2020a. 6202.0 Labour Force, Australia, May 2020, ABS; Canberra
ABS 2020b. Household Impacts of COVID 19 Survey, October 2020, ABS; Canberra
ABS 2020c. 3101.0 Australian Demographic Statistics, December 2019, ABS; Canberra
ABS 2020d. 5220.0 Australian National Accounts: State Accounts, 2018-19, ABS; Canberra
ABS 2020e. 6416.0 Residential Property Price Indexes: Eight Capital Cities, March 2020, ABS; Canberra
ABS 2020f. 3105.0.65.001 Australian Historical Population Statistics, April 2020, ABS; Canberra
ABS 2020g. 6401.0 Consumer Price Index, Australia, June 2020, ABS; Canberra
Alvarez, M., A. Bernard, and S. N. Lieske. 2020. 'Understanding internal migration trends in OECD countries', Population, Space and Place.
Barrett, Rosanne. 2020. 'Regions providing a COVID 19 escape plan: Cheap houses, growing jobs, a fabulous lifestyle: in the regions, people live where they love to be.', The Australian, August 28, 2020.
Bell, Martin. 1996. 'How often do Australians move? Alternative measures of population mobility', Journal of the Australian Population Association, 13: 101–24.
Bell, Martin, Elin Charles Edwards, Aude Bernard and Philipp Ueffing. 2018. 'Global trends in internal migration.' in Tony Champion, Thomas Cooke and Ian Shuttleworth (eds.), Internal Migration in the Developed World: Are we becoming less mobile? (Routledge: Londong).
Bell, Martin, Elin Charles Edwards, Philipp Ueffing, John Stillwell, Marek Kupiszewski, Dorota Population Kupiszewska, and Development Review. 2015. 'Internal migration and development: comparing migration intensities around the world', 41: 33–58.
Bell, Martin, Tom Wilson, Elin Charles Edwards and Philipp Ueffing. 2017. 'Australia: The long run decline in internal migration intensities.' in Tony Champion, Thomas Cooke and Ian Shuttleworth (eds.), Internal migration in the developed world: Are we becoming less mobile? (Routeledge).
Bernard, Aude, Martin Bell and Elin Charles Edwards. 2014. 'Improved measures for the cross national comparison of age profiles of internal migration', Population Studies, 68: 179–95.
Bernard, Aude, Martin Bell, Elin Charles Edwards, and Development Review. 2014. 'Life‐course transitions and the age profile of internal migration', Population and Developemtn Review, 40: 213‐39.
Bernard, Aude, Peta Forder, Hal Kendig and Julie Byles. 2017. 'Residential mobility in Australia and the United States: A retrospective study', Australian Population Studies, 1: 41–54.
Bernard, Aude and Alina Pelikh. 2019. 'Distinguishing tempo and ageing effects in migration', Demographic Research, 40: 1291 322.
Bricker, J and B Bucks. 2016. 'Negative home equity, economic insecurity, and household mobility over the Great Recession', Journal of Urban Economics, 91: 1–12.
Brown, David L, Tony Champion, Mike Coombes and Colin Wymer. 2015. 'The migration commuting nexus in rural England. A longitudinal analysis', Journal of Rural Studies, 41: 118–28.
Clark, William AV and William Lisowski. 2019. 'Extending the human capital model of migration: The role of risk, place, and social capital in the migration decision', Population, Space and Place, 25: e2225.
Cooke, Thomas. 2011. 'It is not just the economy: Declining migration and the rise of secular rootedness', Population, Space and Place, 17: 193–203.
Cooke, Thomas J. 2013. 'Internal migration in decline', The Professional Geographer, 65: 664–75.
Cooke, Thomas John and Ian Shuttleworth. 2017. 'Migration and the Internet', Migration Letters, 14: 331–42.
de Vos, Duco, Evert Meijers and Maarten van Ham. 2018. 'Working from home and the willingness to accept a longer commute', The Annals of Regional Science, 61: 375–98.
Deloitte. 2020. 'Access Economics Business Outlook Report for June.' In.
Foster, Thomas Bradley. 2016. 'Rooted or Stuck? The Causes and Consequences of American Mobility Decline (doctoral dissertation', University of Washington.
Green, Anne E, Terence Hogarth and R Ernest Shackleton. 1999. 'Longer distance commuting as a substitute for migration in Britain: a review of trends, issues and implications', International Journal of Population Geography, 5: 49–67.
Guler, B and A Taskın. 2013. 'Dual income couples and interstate migration.' In Meeting Papers Society for Economic Dynamics.
Harris, John R, and Michael P Todaro. 1970. 'Migration, unemployment and development: a two sector analysis', The American economic review, 60: 126–42.
Kalemba, Sunganani Violet, Aude Bernard, Elin Charles‐Edwards, Jonathan Corcoran and Place. 2020. 'Decline in internal migration levels in Australia: Compositional or behavioural effect?', Population, Space and Place: e2341.

Kim, Seung Nam, Patricia L. Mokhtarian, and Kun Hyuck Ahn. 2012. 'The Seoul of Alonso: New Perspectives on Telecommuting and Residential Location from South Korea', Urban Geography, 33: 1163–91.
Kosar, Gizem, Tyler Ransom and Wilbert der Klaauw. 2020. 'Understanding migration aversion using elicited counterfactual choice probabilities.' In CEDifo Working Paper No. 8177.
Long, Larry. 1991. 'Residential mobility differences among developed countries', International Regional Science Review, 14: 133–47.
Mangum, Kyle and Patrick Coate. 2018. 'Fast Locations and Slowing Labor Mobility', Andrew Young School of Policy Studies Research Paper Series.
Masters, Clare. 2020. 'Melbourne residents fleeing COVID hotspots for safer suburbs and states', Herald Sun, 7 August 2020.
Milne, William. 1993. 'Macroeconomic influences on migration', Regional Studies, 27: 365–73.
Mitchell, William F. 2008. Migration and labour market outcomes by skill in Australia (Centre of Full Employment and Equity, University of Newcastle).
Modestino, Alicia Sasser and Julia Dennett. 2013. 'Are American homeowners locked into their houses? The impact of housing market conditions on state to state migration', Regional Science and Urban Economics, 43: 322–37.
Molloy, R, C Smith and A Wozniak. 2014a. 'Declining migration within the US: the role of the labor market.' In.: National Bureau of Economic Research.
Molloy, Raven and Christopher Smith. 2019. 'US Internal Migration: Recent Patterns and Outstanding Puzzles.' In Prepared for the Federal Reserve Bank of Boston's 63rd Economic Conference.'A House Divided: Geographical Disparities in Twenty First Century America,' October, 4–5.
Molloy, Raven, Christopher L Smith and Abigail K Wozniak. 2014b. 'Declining migration within the US: The role of the labor market.' In.: National Bureau of Economic Research.
Muhammad, Saim, Henk F. L. Ottens, Dick Ettema and Tom de Jong. 2007. 'Telecommuting and residential locational preferences: a case study of the Netherlands', Journal of Housing and the Built Environment, 22: 339–58.
Niedomysl, Thomas 2011. 'How migration motives change over migration distance: Evidence on variation across socio economic and demographic groups', Regional Studies, 45: 843–55.
OECD. 2020. OECD.Stat Data Warehouse. Retrieved from OECD iLibrary: https://www.oecd-ilibrary.org/economics/data/oecd-stat/data-warehouse_data-00900-en
Partridge, Mark D, Dan S Rickman, M Rose Olfert, and Kamar Ali. 2012. 'Dwindling US internal migration: Evidence of spatial equilibrium or structural shifts in local labor markets?', Regional Science and Urban Economics, 42: 375–88.
Plane, David and Peter A. Rogerson. 1994. The Geographical Analysis of Population: With Applications to Planning and Business (Wiley and Sons: New York).
RBA. 2020a. 'Economic Outlook, August 2020.' In.
RBA. 2020b. Statistical Tables. In.
Rhee, S and F Karahan. 2017. 'Population aging, migration spillovers and the decline in interstate migration.' In Federal Reserve Bank of New York Staff Reports. Federal Reserve Bank of New York.
Rogers, Andrei and Luis J Castro. 1981. 'Model migration schedules.' In.: IIASA.
Saks, R and A Wozniak. 2011. 'Labor reallocation over the business cycle: New evidence from internal migration', Journal of Labor Economics, 29: 697–739.
Sánchez, Aida Caldera and Dan Andrews. 2011. 'To move or not to move: What drives residential mobility Rates in the OECD?'.
Schellenberg, Grant, Chaohui Lu, Christoph Schimmele and Feng Hou. 2018. 'The correlates of self assessed community belonging in Canada: Social capital, neighbourhood characteristics, and rootedness', Social Indicators Research, 140: 597–618.
Stone, Juliet, Ann Berrington and Jane Falkingham. 2014. 'Gender, turning points, and boomerangs: Returning home in young adulthood in Great Britain', Demography, 51: 257–76.
Taylor, John and Martin Bell. 1996. 'Population mobility and indigenous peoples: the view from Australia', International Journal of Population Geography, 2: 153–69.
Thomas, Michael, Brian Gillespie and Nik Lomax. 2019. 'Variations in migration motives over distance', Demographic Research, 40: 1097–110.
Todaro, Michael P. 1969. 'A model of labor migration and urban unemployment in less developed countries', The American economic review, 59: 138–48.

Van Der Gaag, Nicole, and Leo Van Wissen. 2008. 'Economic determinants of internal migration rates: a comparison across five European Countries', Tijdschrift voor economische en sociale geografie, 99: 209–22.

Vidal, Sergi, Francisco Perales, Philipp M Lersch and Maria Brandén. 2017. 'Family migration in a cross national perspective: The importance of within couple employment arrangements in Australia, Britain, Germany, and Sweden', Demographic Research, 36: 307–38.

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APPENDIX A: METHODS

INTERSTATE MIGRATION RATE, 1978–2019 (TABLE 6)

Table 10 presents the results of the unit root test to ascertain the order of integration of interstate migration and explanatory variables. All variables are in logarithms to interpret the coefficients as elasticities and to log-normalise skewed distributions. A DF-GLS test (Elliott et al. 1996) was performed and the Zivot and Andrews (1992) test takes into account a structural break. All variables were found as nonstationary, except median age.

Table 10. UNIT ROOT TESTS

Variable	DF — GLS_c	DF — GLS_t	ZA_c	ZA_{ct}
cmi	-0.97	-1.39	-3.7	-3.64
Δcmi	-4.14***	-4.37***	-4.83**	-5.79***
GDP	0.28	-1.21	-2.11	-2.92
ΔGDP	-3.44***	-3.61***	-4.72*	-4.83*
unemp	-1.34	-2.02**	-3.52	-3.06
Δunemp	-3.86***	-3.98***	-5.22**	-5.14**
female	0.36	-1.6	-4.67*	-4.55
Δfemale	-2.79***	-3.26***	-4.46	-5.88***
age	-1.99**	-2.36**	-3.5	-3.44
Δage	-1.53	-1.83*	-3.63	-3.74

Note: All tests included two lags. ***, ** and * indicate significance at the 1 per cent, 5 per cent and 10 per cent level, respectively.

Given that most variables are nonstationary, standard regression methods could result in spurious estimations (Granger and Newbold 1974). However, if the series is nonstationary but cointegrated (i.e. they have a long-term equilibrium association), estimation of long-run relationships are superconsistent (Stock 1987). The Engle and Granger (1987) two-steps approach was used to test whether the variables are cointegrated or not. The following long-run model was estimated:

$$cmi_t = \beta_0 + \beta_1 gdp_t + \beta_2 unemp_t + \beta_3 female_t + \beta_4 age_t + u_t \quad \textbf{(1)}$$

To obtain consistent and efficient estimates, equation (1) was estimated using the dynamic OLS (D-OLS) (Saikkonen 1991).

To determine if the estimated relationship is cointegrated, a unit root test was performed on the residuals of the regression. This is because if the residuals are nonstationary, there is no cointegration. If the residuals are stationary, it is inferred that there is cointegration. The $DF - GLS$ statistic (including intercept and 2 lags) is -2.95, suggesting there is evidence at the 1 per cent level that estimated relationship, given in equation (1), is a cointegrating (long-run) relationship. The following underlying Error Correction Model was estimated:

$$cmi_t = \beta_0 + \beta_1 \Delta cmi_{t-1} + \gamma_1 \Delta gdp_{t-1} + \Delta\gamma_2 unemp_{t-1} + \gamma_3 \Delta female_{t-1} + \gamma_4 \Delta age_{t-1} + \phi ect_{t-1} + \epsilon_t \quad \textbf{(2)}$$

where ect_{t-1} is the error correction term, corresponding to the lagged residuals from the estimated long-run relationship, u_{t-1}.

In and out migration rates, 1990–2018 (Table 7)

A panel time-series approach was undertaken of all states and territories covering the period 1990–2019 to estimate the effect of state-related economic and socio-demographic conditions on the in and out migration rates. Then, state-level real income per capita measured as the gross state product per capita in 2012 Australian dollars, unemployment rate, female labour force participation, the proportion of young adults and the net international migration rate were added as regressors, all relative to the rest of Australia. For the interstate in migration rate model, these variables were seen as pull factors since they indicate how these features in each state influence the attractiveness of the state as a destination, whereas the out migration rate model characterised these variables as push factors.

To distinguish between short- and long-term effects, the Pooled Mean Group estimator (Pesaran et al. 1999) was employed, which is consistent regardless of the order of integration of the series. An additional benefit is that it estimates the same long-run parameters for all states and territories while allowing for state-heterogeneity in the short-run effects.

For empiric estimation, the following were considered on the autoregressive distributed lag model of order one in all variables, $ARDL(1,1,1,1,1,1)$. Thus, its underlying Error Correction Model becomes:

$$\Delta mig_{it} = \phi_i(mig_{i,t-1} - \theta_{1i}GSP_{i,t-1} - \theta_{2i}unemp_{i,t-1} - \theta_{3i}female_{i,t-1} - \theta_{4i}age_{i,t-1} - \theta_{5i}international_{i,t-1}) + \delta^*_{1i}\Delta GSP_{it} + \delta^*_{2i}\Delta unemp_{it} + \delta^*_{3i}\Delta female_{it} + \delta^*_{4i}\Delta age_{it} + \delta^*_{5i}\Delta international_{it} + \mu_i + \epsilon_{it} \quad \textbf{(3)}$$

The θs represent the long-run coefficients and the ϕ_i is the error correction term whose reciprocal in absolute value provides the speed of adjustment towards the long-run equilibrium. A negative and significant ϕ_i is evidence of long-run causality running from the explanatory variables to the dependent variable. Finally, the δ^*s are the short-run coefficients. Their significance suggests short-run causality from the associated regressors to the dependent variable.

Bilateral interstate migration flows, 2004–08 (Table 8)

The following gravity model was estimated with all factors at origin and destination, including the population-weighted distance, in logarithms:

$$m_{ij,t} = \alpha_{ij} + \beta_0 d_{ij,t-1} + \beta_{1i}p_{i,t-1} + \beta_{1j}p_{j,t-1} + \gamma_1 y_{i,t-1} + \delta_1 y_{j,t-1} + \gamma_2 u_{i,t-1} + \delta_2 u_{j,t-1} + \gamma_3 h_{i,t-1} + \delta_3 h_{j,t-1} + \gamma_4 f_{i,t-1} + \delta_4 f_{j,t-1} + \gamma_5 a_{i,t-1} + \delta_5 a_{j,t-1} + \gamma_6 i_{i,t-1} + \delta_6 i_{j,t-1} + \epsilon_{ij} \quad \textbf{(4)}$$

Income is the real gross state product per capita in 2012 prices. The housing cost is a representative of the total value to pay for a dwelling assuming that it is paid in full with a 25-year mortgage where the interest rate is the average annual lending rate of banks for housing loans. The regional housing price in a given year corresponds to the weighted average of the median house prices and median attached dwellings prices in real terms.

Given the shorter period, there was no attempt to estimate the long- and short-term relationships as done above. Instead, traditional panel regressions were employed. The results should be interpreted as short-term effects. Two-way fixed effects are used to control for a time as well as period fixed invariant features to limit possible endogeneity problems. In particular, the individual fixed effects are set on the origin-destination pair (dyadic fixed effects) to control for any deterministic bilateral relationship. All explanatory factors were lagged one year to deal with reversal causality.

Inter-GCCSA migration by flow type, 2013–18 (Table 9)

The same gravity model as at the state and territory level was estimated and given in equation (4), but now for the GCCSA regions with data covering the 2013–18 period. To distinguish the effect of push and pull factors

between different types of GCCSAs, the model including all GCCSAs (first column of results) was estimated as well as for 4 sub-samples: between capital cities (second column), from capital cities to rest of states (third column), from rest of states to capital cities (fourth column) and between rest of state areas (last column).

References

Elliott, G., Rothenberg, T. J., & Stock, J. H. (1996). Efficient test for an autoregressive unit root. Econometrica, 64(4), 813–836.

Engle, R. F., & Granger, C. W. J. (1987). Co-integration and error correction: Representation, estimation and testing. Econometrica, 55(2), 251–276.

Granger, C., & Newbold, P. (1974). Spurious regressions in econometrics. Journal of Econometrics, 2(2), 111–120.

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. Journal of the American Statistical Association, 94(446), 621–634.

Saikkonen, P. (1991). Asymptotically efficient estimation of cointegration regressions. Econometric Theory, 1–21.

Stock, J. H. (1987). Asymptotic properties of least squares estimators of cointegrating vectors. Econometrica: Journal of the Econometric Society, 1035–1056.

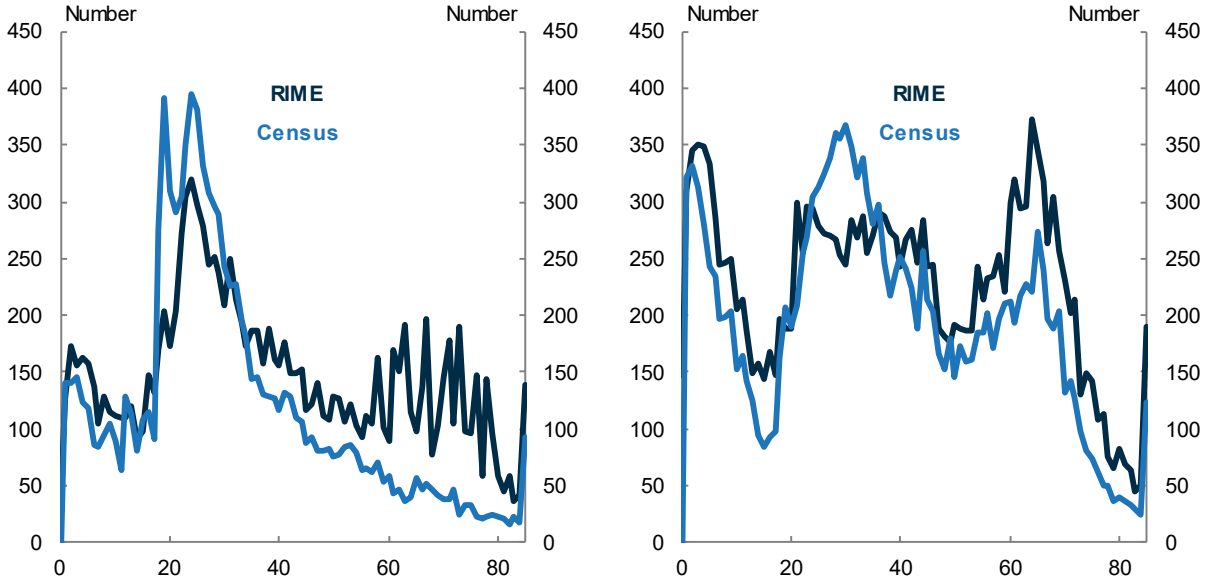
Zivot, E., & Andrews, D. W. (1992). Further evidence on the great crash, the oil-price shock and the unit-root hypothesis. Journal of Business & Economic Statistics, 10(3), 251–2

APPENDIX B: COMPARISON OF CENSUS AND RIME AGE PROFILES

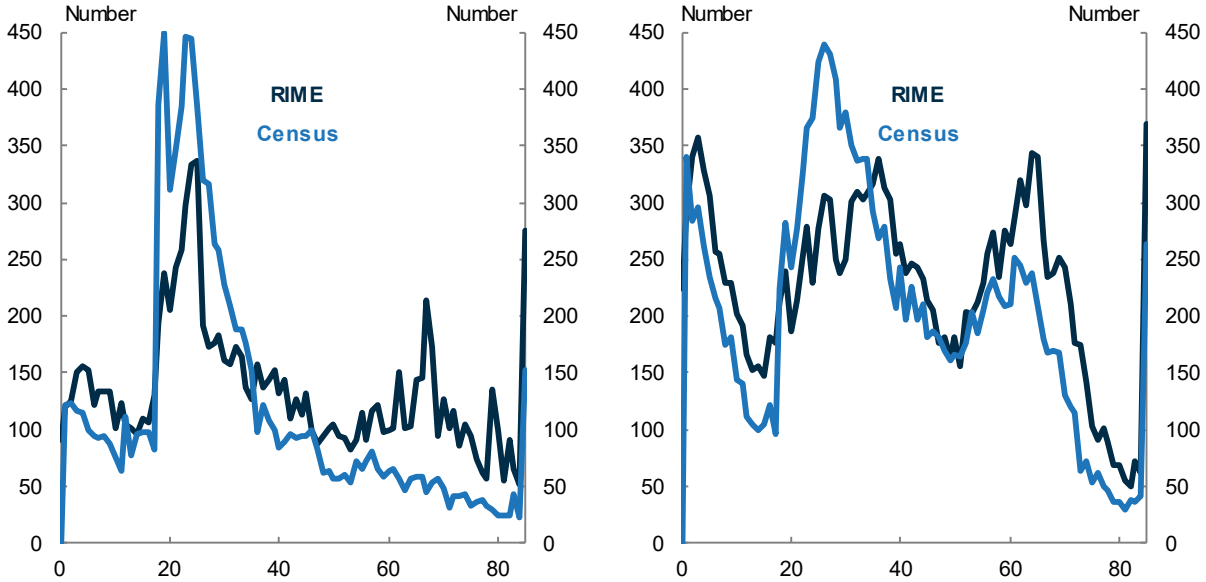
For GCCSAs, Census internal migration data tend to better capture migration age than RIME data, especially for intrastate flows. However, Census data are produced every 5 years, whereas RIME data are produced every year. As such, RIME is typically preferred for time series analysis, while Census data (or a combination of Census data and RIME) are sometimes preferred for population projections.

Chart 28. CENSUS AND RIME DATA 2015–16 FOR SELECTED INTER-GCCSAS MIGRATION

MALES, REST OF NEW SOUTH WALES TO GREATER SYDNEY (LHS) AND GREATER SYDNEY TO REST OF NEW SOUTH WALES (RHS)



FEMALES, REST OF NEW SOUTH WALES TO GREATER SYDNEY (LHS) AND GREATER SYDNEY TO REST OF NEW SOUTH WALES (RHS)



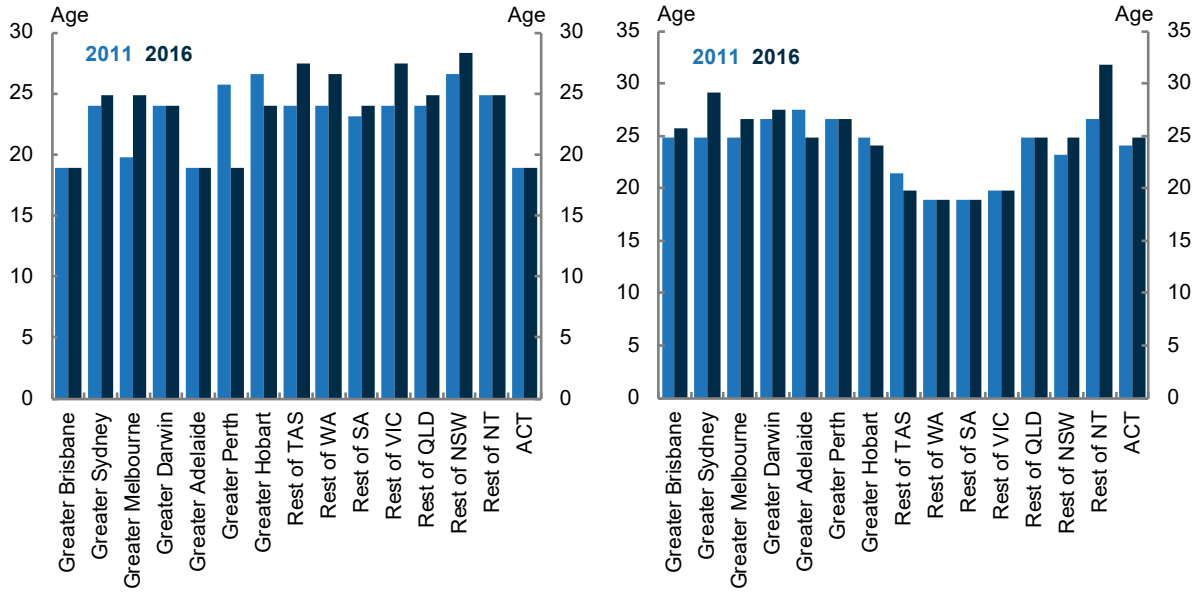
Source: Australian Bureau of Statistics, Census data. Author's calculations from Australian Bureau of Statistics unpublished data.

CENSUS AGE PROFILES

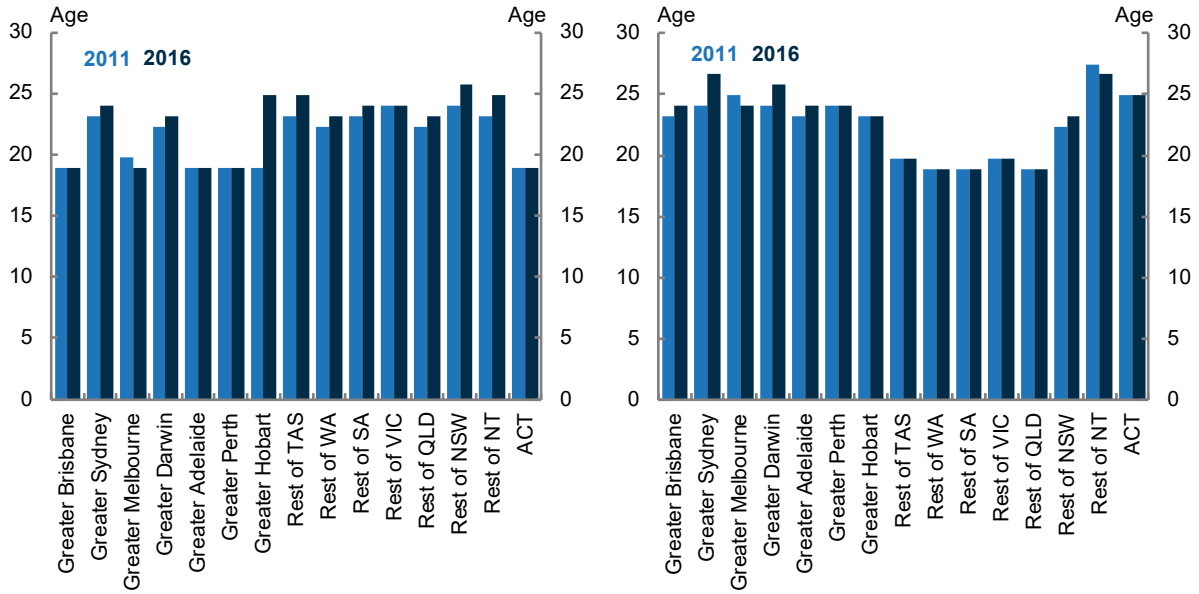
Analysis of Census internal migration data (Chart 29) shows an increase in the age at peak migration for men and women, supporting the findings based on RIME data presented in Section 6.4.

Chart 29. AGE AT PEAK MIGRATION INTENSITIES FOR GCCSAS, CENSUS DATA, 2010–11 AND 2015–16, BY IN MIGRATION (LHS) AND OUT MIGRATION (RHS)

MALES



FEMALES



Source: Australian Bureau of Statistics, Census data.