Internal Migration and House Prices in Australia

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Background Discussion

- Internal migration is a neglected component of population change.
  - Researchers and policymakers generally focus on natural increase (the excess of births over deaths) and international migration components of population growth/decline.
  - Internal migration is three times that of international migration, affecting the lives of far more people although it is given much less attention in political debates and planning processes

- Population growth through *overseas migration* might not be a useful factor as immigrants in Australia rarely buy a property and a vast majority rent for several years (Dowling, 2019).
  - Population growth through births has no impact on the market in the SR, and deaths, may add some supply, but not a significant number.
  - Hence, examining where the Australian residents choose to move, and settle is a better indicator of where housing price growth is to be expected.

Background Discussion

- Australia:
  - has the highest level of internal mobility, which is still increasing at a modest rate, unlike other developed countries in Europe and the US *[Charles-Edwards et al., 2018, ABS Report].*
  - exhibits the highest level of residential mobility among the 16 countries (including the US and fourteen European countries) with an average of 5.1 moves per individual between ages 17 to 50 years *[Bernard et al., 2017, Australian Population Studies].*
  - 39% of the population changing their address within the country in the five years before the latest Census. Whilst across the world, on average, 21% move at least once every five years *[Bell et al., 2015, Population and Development Review].*

Literature on Immigration & Housing Prices

- A large body of literature on the impacts of international migration on housing prices and/or rents in various countries.
  - **USA**: Saiz and Wachter (2011) *American Economic Journal: Economic Policy* ; Saiz (2007) *Journal of Urban Economics;* **UK**: (Sa, 2015) *The Economic Journal;* **Canada:** (Akbari and Aydede, 2012) *Applied Economics*; **Australia:** (Moallemi and Melser, 2020); *Papers in Regional Science*; **Switzerland:** (Degen and Fischer, 2017) *Swiss Journal of Economics and Statistics*; **Spain:** (Gonzalez and Ortega, 2013) *Journal of Regional Science*.

- Mixed results & different effects depending on the level of geographic disaggregation used
  - Positive estimate of immigration on both rents and prices when looking at broad regions (metropolitan areas). Saiz (US – inflows): 2.9-3.4%; Degen and Fisher (Switzerland – inflows): 2.7%; Gonzalez and Ortega (Spain – foreign population): 3.2%. For Canada & NZ: Smaller + effects with Census data/ long-run effects.
  - Negative impacts of immigration on average house prices and/or rents, mainly when focusing on small local areas – i.e., neighbourhoods in metropolitan areas. See Saiz and Watcher (2011) for the US & Sa (2015) for the UK. Main explanation is the displacement of (wealthy) natives from these neighbourhoods.

Literature on Migration & Housing Prices

- A handful of working papers have investigated the impact of internal migration on house prices and/or rents in *Sweden* (Tyrcha, 2020), *New Zealand* (Stillman and Mare, 2008), and *China* (Wang et al., 2017)
  - there is a positive effect of internal migration on housing prices and/or rents.

- Existing research on the Australian experience of internal migration:
  - characteristics of internal migrants – age, gender, birthplace, labour force, and education,
  - determinants of migration flows *[Bell and Hugo, 2000; Bell and Cooper,1995; Jarvie, 1989; Rowland, 1979].*
  - relationship between international migration inflows and internal outmigration within the context of global/gateways cities *[Burnley, 1996, Journal of the Australian Population Association; Ley, 2007, Economic Geography].*

- No study on a causal impact of internal migration on housing prices in Australia.

Importance

1. Internal migration is three times that of international migration affecting the lives of far more people. Less attention due to the limited or outdated data.

2. The estimated sign and magnitude of internal migration effect on housing prices could vary across different regions within a country. Knowledge to local governments and/or policymakers. Less control over internal migration → Housing policies – e.g., affordable housing supply both for the existing migrants and the potential newcomers.

3. Over the past few years there is a strong argument by the property experts that internal migration away from Australia's big cities causing house prices to increase in non-capital city locations like regional cities or suburbs. Testing the validity of this argument, our empirical findings could provide valuable insights to the property investors.

Contributions

- The first attempt in the literature to investigate the causal impact of internal migration on house prices in Australia between 2014 and 2019.
- A rich dataset
  - 237 Statistical Areas Level 3 (SA3) which are geographical areas. Advantage → local economic impact of internal migration →Rather than state-, metropolitan area- or city-level data.
  - Our data allow us to measure house price changes and the spatial concentration of migrants yearly instead of relying on discrete Census data, as is typically the case in the literature.
- To address the potential endogeneity problem due to simultaneous causality between migration and house price changes we employ a manually constructed instrument that matches the shift-share instrument used in the immigration literature.
- Eventually, this paper adds a new narrative to the housing-migration relationship by exploring whether and to what extent, internal migration affects house prices across Australia, one of the most mobile countries in the world through internal migration.

Main Findings

- Internal migration ⇧ the demand for housing in migration-receiving areas → house price ⇧

- 2SLS → New migrants that amount to 1% of the initial local area population are associated with point estimates of 0.7% to 0.8% increase in house prices.

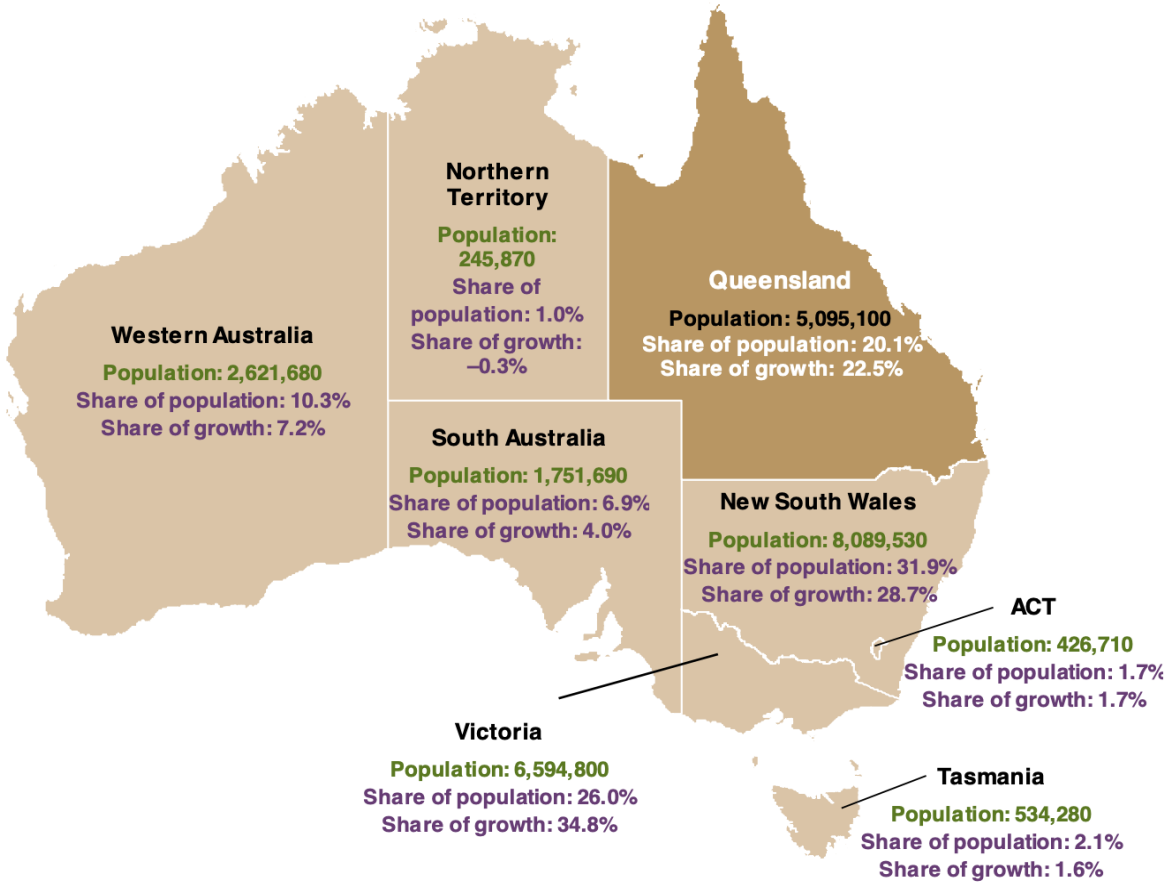
- Our results suggest that migration inflow has a significant positive effect on house price changes in metropolitan areas such as Sydney and Melbourne rather than non-metropolitan areas in Australia.

- IV estimates are more positive than those obtained by OLS estimation suggesting that internal migrants tend to move towards SA3 regions, in which house prices are growing more slowly.

In this paper we focus on three most populated states of Australia: Queensland, New South Wales, and Victoria (east coast)

As of 2019:

- 78% of total population,
- 86% of economic growth,
- 84% of the total value of housing stock



Between 2014 and 2019 (period considered)

- NSW, VIC, and QLD together accounted for 87.7% of national population growth.

- We work at the SA3 level area.

representing geographical areas for a regional breakdown of Australia.

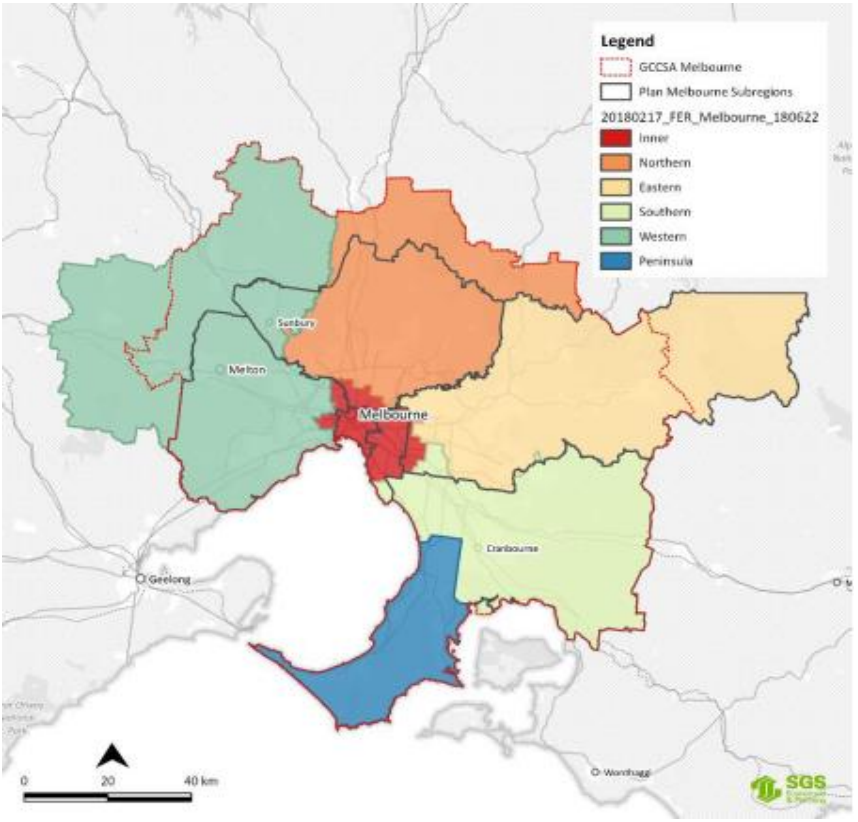
Population → 30,000 to 130,000

Major cities → The area serviced by a major transport and commercial hub

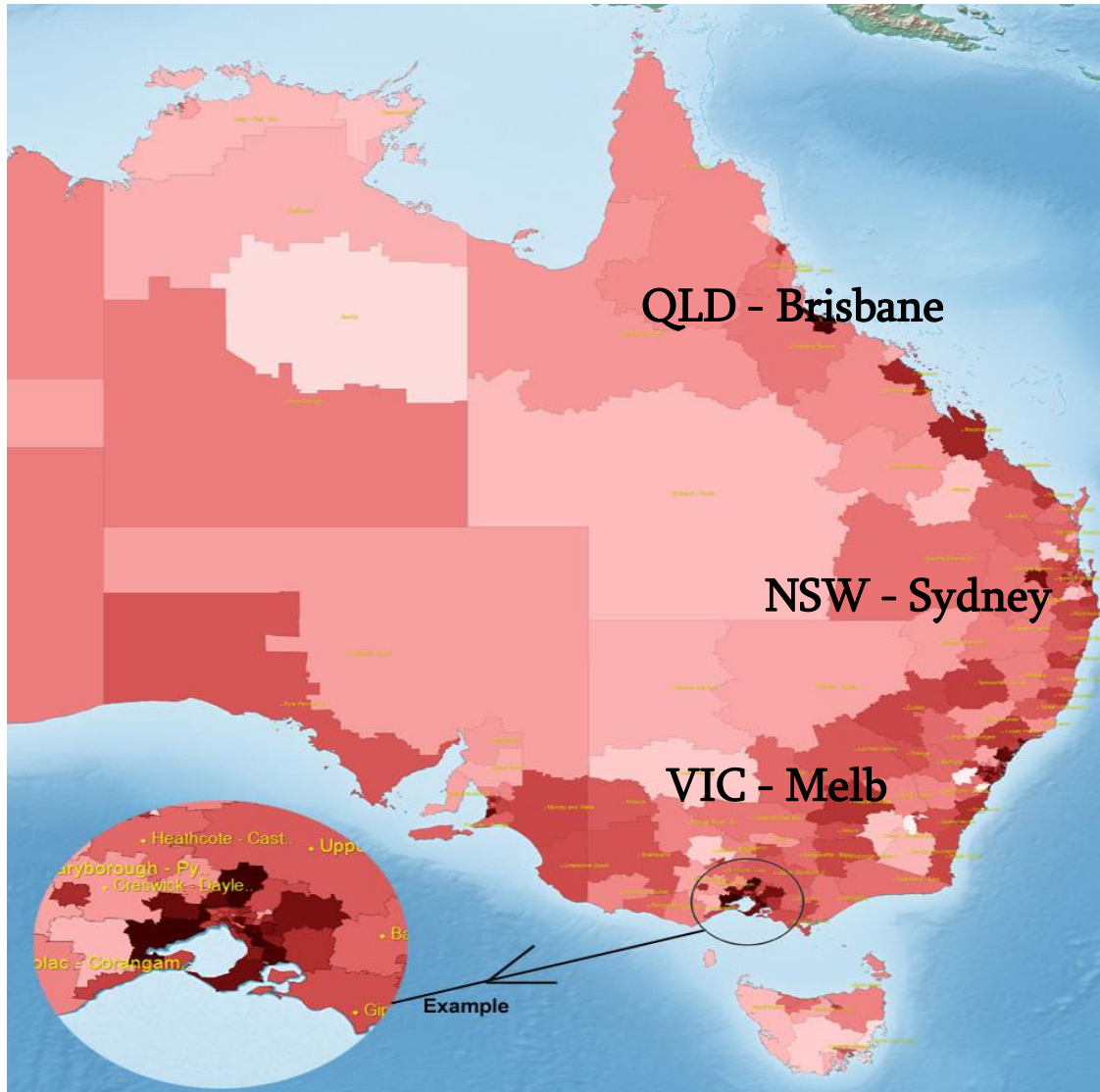
Regional areas → The area serviced by regional cities with population over 30,000

Greater Capital City Statistical Areas (GCCSA) – functional extent of capitals—Brisbane, Sydney, Melbourne

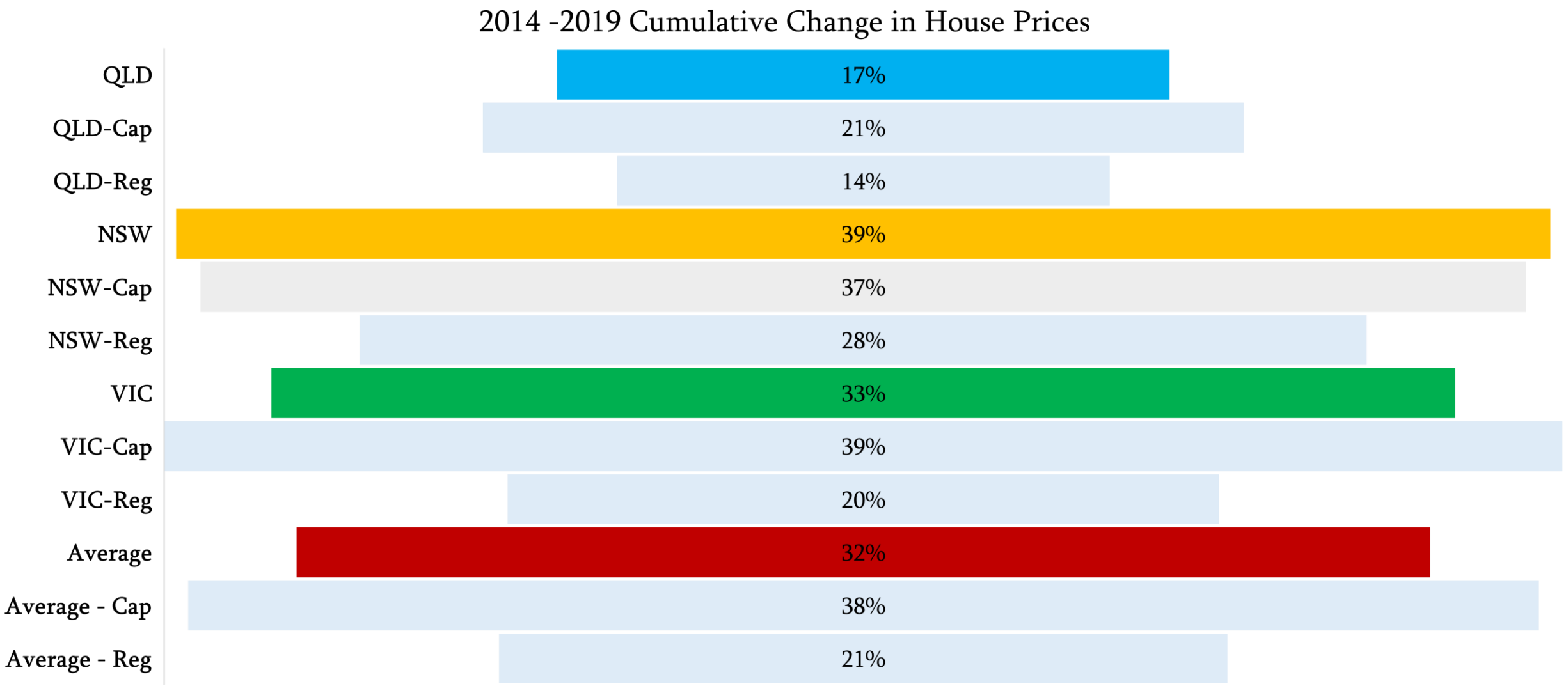
Rest of State Statistical Areas (RSSA) – the rest



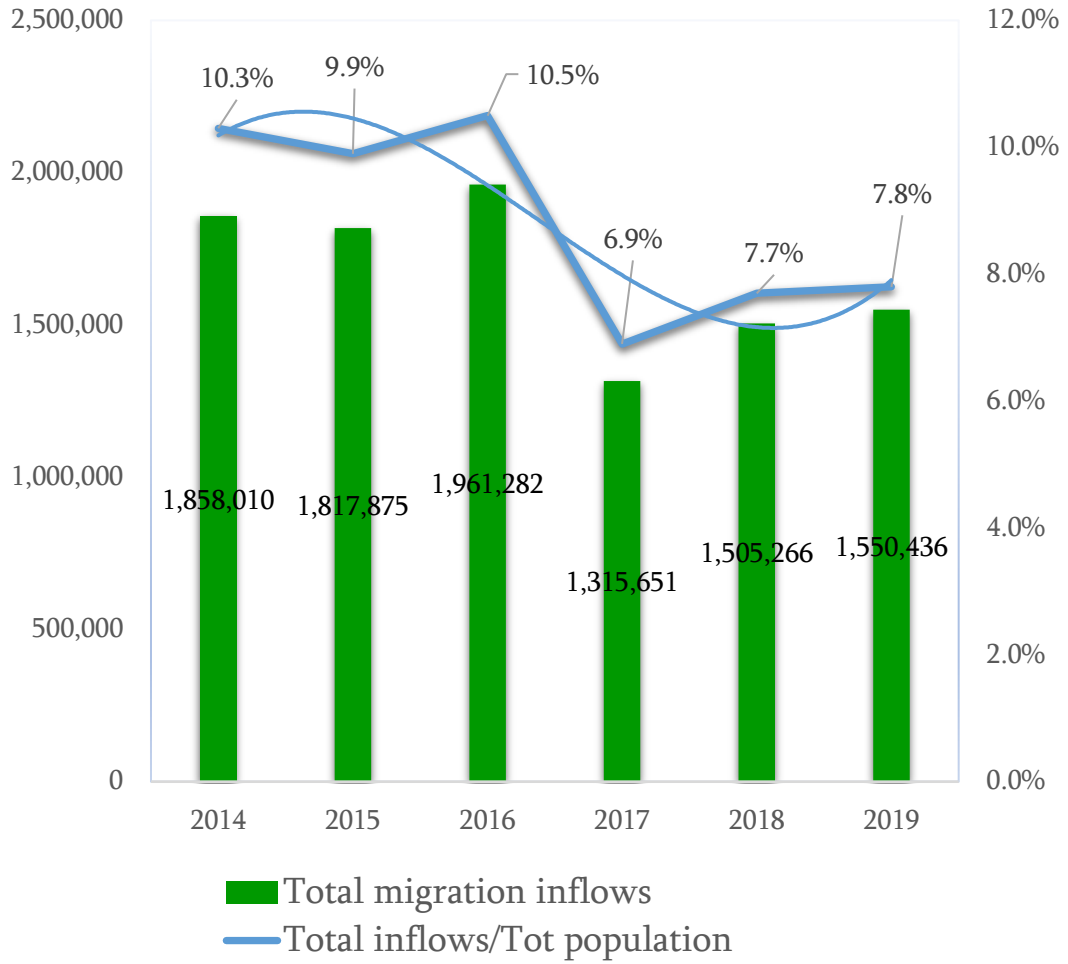
Within each State and Territory, the areas not defined as being part of the Greater Capital City are represented by a Rest of State regions such as Rest of New South Wales, Rest of Victoria and Rest of Queensland.

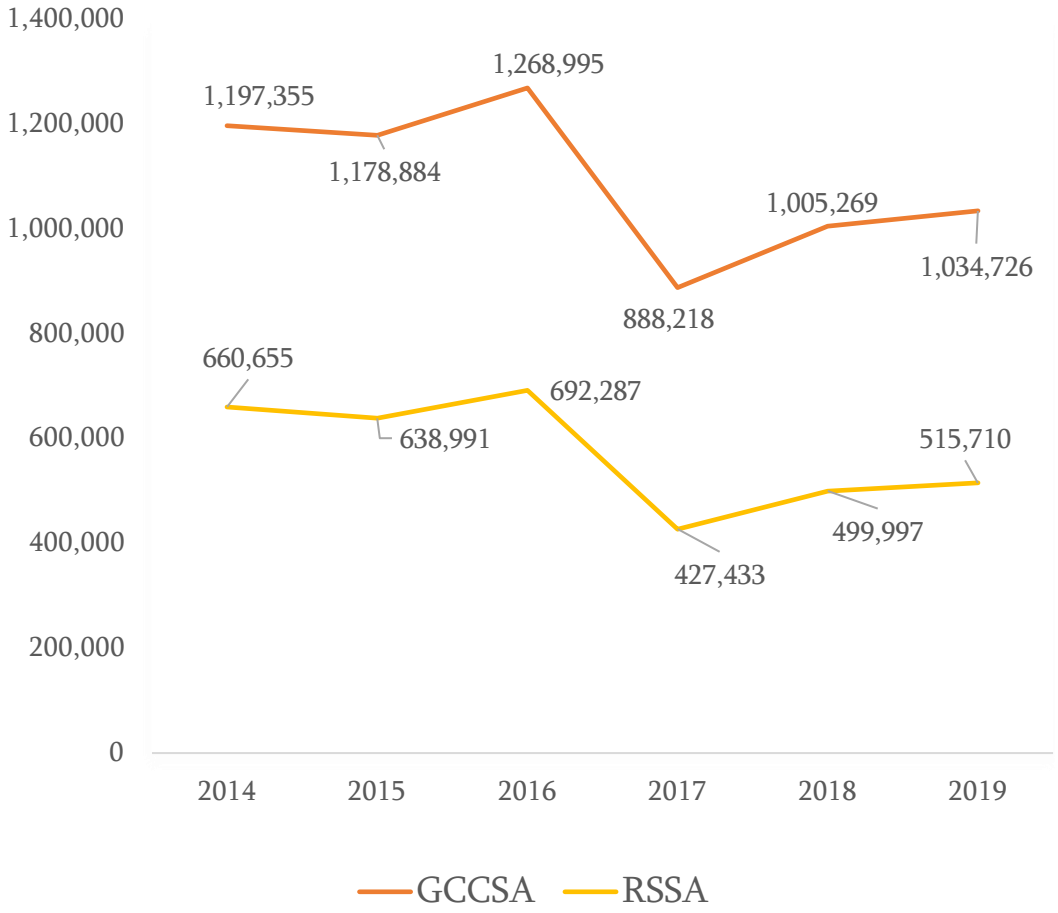


House Prices Statistics



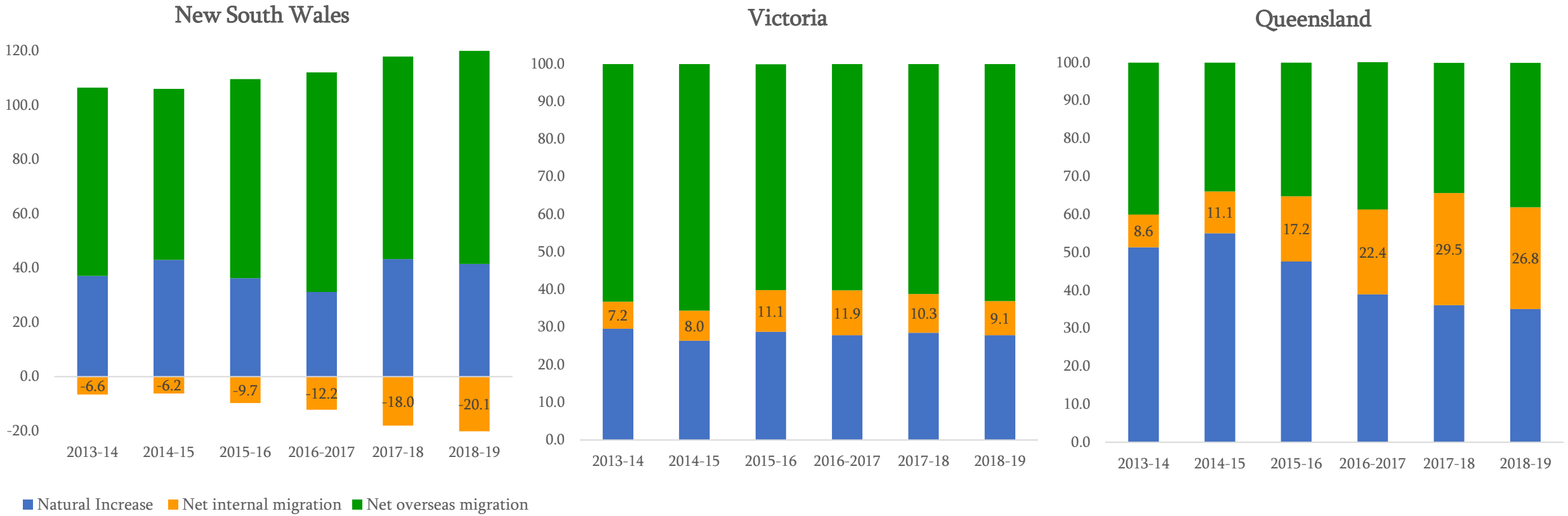
Internal migration (both interstate and intra-state moves) has been a strong contributor to resident population growth over the past years. On average 9%.





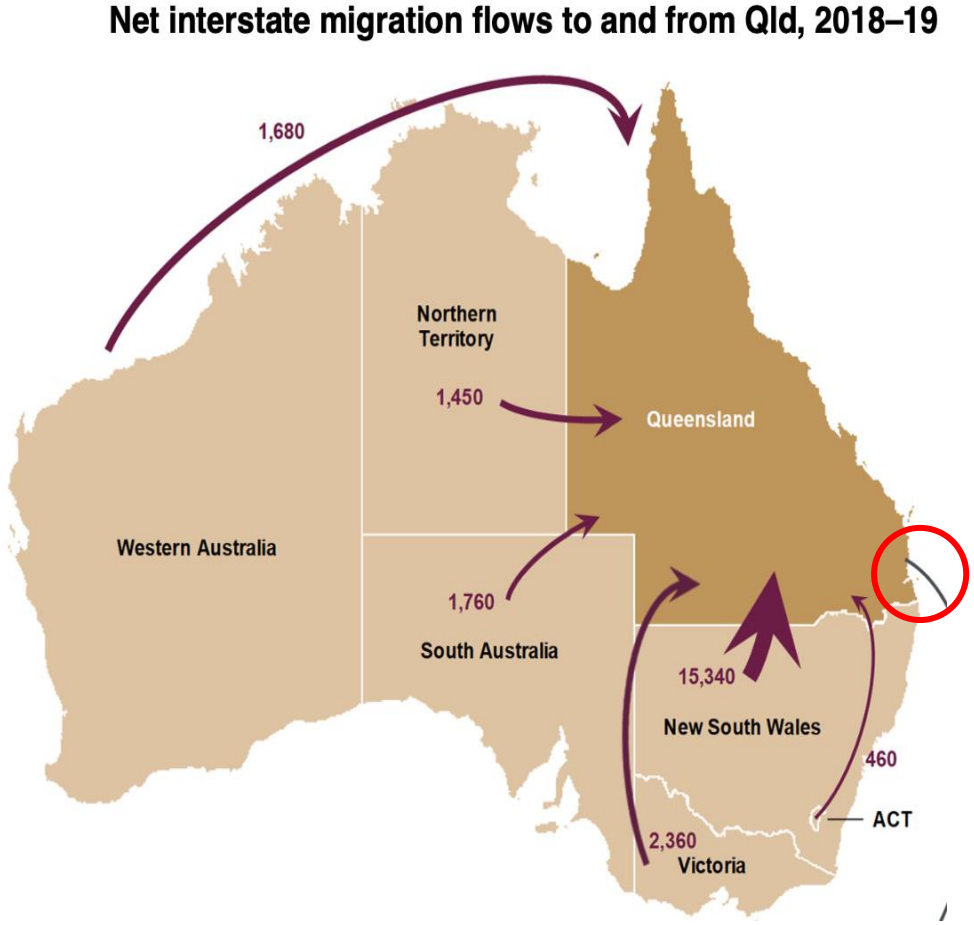
Total migration inflows in Greater Capital City Statistical Areas (GCCSA) and Rest of State Statistical Areas (RSSA)

Total resident population in NSW, VIC, and QLD increased from 18.1 million in 2014 to 19.8 million people in 2019 (ABS data). However, the components are different at each state.



- While NSW (especially Sydney) suffers from internal migration numbers, VIC and QLD had a net gains in population from internal migration.
- Queensland is the top destination for interstate migration.

Which parts of Australia are growing through internal migration?
Coastal cities of the Gold Coast and the Sunshine Coast in Queensland.



Data

- We study annual house price changes in the 2014-2019 period across 237 Statistical Areas Level 3 (SA3) in QLD, NSW and VIC.

- We employ *disaggregated* data (rather than state-, metropolitan area- or city-level data), which is crucial for studying the local economic impact of internal migration.

- Our data set also allows us to measure house price changes and the spatial concentration of migrants *yearly*, as opposed to having to rely on Census data, as is typically the case in the literature.

- Data source: Australian Bureau of Statistics

Empirical Specification

Following the standard strand of the literature, the following model is used:

$$\Delta ln(HP_{i,t}) = \beta \left(\frac{Migrants_{i,t-1}}{Population_{i,t-2}} \right) + \alpha X_i + \delta Y_{i,t-1} + \rho \Delta Z_{i,t-1} + \emptyset_i + \Lambda_t + \Delta \varepsilon_{i,t}$$

$\boldsymbol{\Delta\, ln(HP_{i,t})}$ is the change in the log of the median house sales price in each SA3 area i between years $t-1$ and t.

$\frac{\boldsymbol{Migrants_{i,t-1}}}{\boldsymbol{Population_{i,t-2}}}$ the annual inflow of migrants in year $t-1$ divided by the initial population in year $t-2$ in a local area. Standardising migration flows by initial population stock deals with the fact that regions of different sizes have different population and house price dynamics.

$\boldsymbol{X_i}$: stands for initial local area attributes such as having a coastline and total land area. Supply factors-land availability!

$\boldsymbol{Y_{i,t-1}}$: lagged local area characteristics, unemployment rate (demand) & no.of dwelling/population (supply) –

Note: no. of dwelling/population (supply) might be endogenous to changes in price via demand side, we instrument for changes in the housing stock with the migration-driven population shock.

$\boldsymbol{Z_{i,t-1}}$: time-varying area characteristics (well known essential determinants of housing prices), change in local wages & change in no. of jobs.

$\emptyset_i$: state level area fixed effect

$\boldsymbol{\Lambda_t}$: time fixed effect

Potential Drawbacks

$$\Delta ln(HP_{i,t}) = \beta \left(\frac{Migrants_{i,t-1}}{Population_{i,t-2}} \right) + \alpha X_i + \delta Y_{i,t-1} + \rho \Delta Z_{i,t-1} + \emptyset_i + \Lambda_t + \Delta \varepsilon_{i,t}$$

1. Time-invariant unobserved heterogeneity or local area fixed-effects:
   - Estimation in first differences eliminates time-invariant, area-specific factors that affect migration flows and house prices. In addition, $\emptyset_i$ & Λ_t are included.

2. Housing prices cannot adjust immediately! It may take some time for migration to affect house prices;
   - Following Saiz (2007), we estimate the change in house price from $t-1$ *to* t **as a function** of one-year lagged migration inflow at $t-1$ divided by total resident population at $t-2$. Using lags of the control variables, we accept that house prices do not adjust instantaneously to changes in fundamentals.

3. Simultaneous causality between migration flows and house price changes. Known as self-selection problem. Prosperous vs other areas.
   - We employ a new, manually constructed instrument that matches the shift-share instrument used in the immigration literature

Instrumental Variable

- For the predicted recent distribution of migrants based on their past spatial concentration
- as they tend to move to areas where other migrants settled before (Thomas, 2019, *Population, Space and Place*).

- [e.g., Cooke et al. (2016), *Demographic Research*; Das et al. (2017) & Pettersson and Malmberg (2009), *Population, Space and Place*); Burnley et al. (2007), *Urban Policy and Research*]

- Empirical evidence on the internal migration dynamics:
  - non-resident family members and/or friends
  - in addition to employment and education motives

as an attraction factor encouraging migration motives for long-distance (e.g., inter-state).

- An instrumental variable based on the settlement pattern of migrants in an earlier period is constructed.
  - We use the settlement pattern of migrants in 2007 to predict the geographical distribution of migrants in the current period – because migration estimates data at the SA3 are available from 2007 (the main base year used for 'past' which goes back reasonably well compared to the analysis period starting in 2014).
  - Our identification strategy is based on the tendency of newly arriving migrants to settle in areas where previous migrants from the same area already settle in.
- Validity assumption: Past settlement pattern of migrants is uncorrelated with recent or current changes in the economic performance of geographic areas.

Instrumental Variable

- Inflow of migrants in SA3 region *i* as a share of the initial local population

$$\frac{\sum_r \gamma_{ri0}\, Migrants_{rt-1}}{Population_{it-2}}$$

where $\gamma_{ri0} = \frac{migrants_{ri0}}{total\ migrants\ move\ out_{r0}}$ [share of migrants depart from SA3 region *r* that moved into or settle in region *i* in the base year *t*]

- $Migrants_{rt-1}$: the total number of migrants that move out of region *r* in year *t-1*;
- $\gamma_{ri0}\, Migrants_{rt-1}$: the predicted inflow of migrants from region *r* in year *t-1* that choose to locate in region *i.*
- $\sum_r \gamma_{ri0}\, Migrants_{rt-1}$: Summing across all 328 SA3 regions of origin across all states and territories of Australia, we obtain a measure of the predicted migration inflow in region *i* in year *t-1*.

Note: As the migrants' country of birth information is not available in our dataset (ABS Data by Region at the SA3 level), it is not possible to analyse the separate impact of native versus foreign-born residents' mobility on house prices.

OLS Estimation Results

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Migrants at t-1/Resident Population at t-2	**0.453*** [0.023]**	**0.382*** [0.045]**	**0.623*** [0.061]**	**0.619*** [0.065]**	**0.583*** [0.067]**	**0.631*** [0.061]**	**0.626*** [0.062]**	**0.486*** [0.068]**	**0.637*** [0.070]**
Log of Land Area			-0.004*** [0.001]	-0.008*** [0.001]	-0.008*** [0.001]	-0.007*** [0.001]	-0.006*** [0.001]	-0.005*** [0.001]	-0.007*** [0.001]
Coastal Dummy			0.008** [0.003]	0.005 [0.004]	0.005 [0.004]	0.005 [0.004]	0.009** [0.004]	0.008** [0.003]	0.005 [0.004]
Number of Dwellings Approved at t-1/Population at t-1			-0.467 [0.286]	0.013 [0.329]	-0.384 [0.403]	-0.466 [0.403]	-0.592 [0.413]	-0.568 [0.402]	-0.462 [0.410]
Unemployment Rate at t-1			0.002** [0.001]	0.002*** [0.001]	0.002*** [0.001]				
Δ Log Median Wage at t-1				1.110*** [0.207]	1.192*** [0.226]	1.178*** [0.225]	1.152*** [0.224]	1.179*** [0.225]	1.180*** [0.224]
Δ Log Number of Jobs at t-1					0.341** [0.156]	0.350** [0.161]	0.360** [0.158]	0.333** [0.163]	0.349** [0.164]
Rest of States *[Migrants$_{t-1}$/Resident Population$_{t-2}$]							-0.178*** [0.044]		
Sydney & Melbourne *[Migrants$_{t-1}$/Resident Population$_{t-2}$]								0.310*** [0.064]	
Brisbane *[Migrants$_{t-1}$/Resident Population$_{t-2}$]									-0.010 [0.051]
Observations	1,122	1,122	1,122	885	885	885	885	885	885
R-squared	0.23	0.40	0.43	0.60	0.61	0.61	0.61	0.62	0.61
Year Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Note: SA3-level clustered standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1, Δ indicates first difference. Models 3 includes initial local area attributes and lagged local area characteristic, Model 4 and 5 further include the time-varying local area characteristics. Model 6 excludes unemployment rate. Model 7 to 9 includes interactions to capture further impacts.*

- Internal migration is a significant explanatory variable for changes in house prices – estimated beta ranges 0.38 (model 2) to 0.64 (model 9).
- House prices in a SA3 region increase with an internal migration impact equal to 1% of the same local area's initial population.
- Our additional control variables seem to robust correlates of house price growth.
- Coefficients cannot be interpreted as the causal impact of internal migration on house prices as the location selection decisions of migrants are not random.

IV Estimation Results

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Migrants at t-1/ Resident Population at t-2	**0.429*** [0.022]**	**0.406*** [0.048]**	**0.721*** [0.066]**	**0.773*** [0.103]**	**0.735*** [0.111]**	**0.767*** [0.102]**	**0.731*** [0.102]**	**0.617*** [0.106]**	**0.806*** [0.127]**
Log of Land Area			-0.005*** [0.001]	-0.009*** [0.001]	-0.009*** [0.001]	-0.008*** [0.001]	-0.007*** [0.001]	-0.006*** [0.001]	-0.008*** [0.001]
Coastal Dummy			0.007** [0.003]	0.004 [0.004]	0.004 [0.004]	0.004 [0.004]	0.008** [0.004]	0.007** [0.004]	0.004 [0.004]
Number of Dwellings Approved at t-1/Population at t-1			-0.752** [0.295]	-0.410 [0.406]	-0.773* [0.452]	-0.823* [0.444]	-0.869* [0.446]	-0.841* [0.434]	-0.811* [0.443]
Unemployment Rate at t-1			0.001** [0.001]	0.002** [0.001]	0.002** [0.001]				
Δ Log Median Wage at t-1				1.039*** [0.229]	1.129*** [0.251]	1.124*** [0.251]	1.122*** [0.250]	1.142*** [0.251]	1.129*** [0.250]
Δ Log Number of Jobs at t-1					0.320** [0.163]	0.329** [0.167]	0.345** [0.165]	0.319* [0.169]	0.321* [0.174]
Rest of States *[Migrants$_{t-1}$/Resident Population$_{t-2}$]							-0.181*** [0.043]		
Sydney & Melbourne *[Migrants$_{t-1}$/Resident Population$_{t-2}$]								0.269*** [0.064]	
Brisbane *[Migrants$_{t-1}$/Resident Population$_{t-2}$]									-0.060 [0.065]
First Stage IV Coefficient	1.119*** [0.038]	1.056*** [0.103]	0.816*** [0.187]	0.887*** [0.129]	0.882*** [0.132]	0.901*** [0.130]	0.911*** [0.132]	0.870*** [0.144]	0.855*** [0.150]
First Stage F test	888.5	104.8	19.12	47.00	44.66	48.24	47.92	36.47	32.64
Observations	1,112	1,112	1,112	880	880	880	880	880	880
R-squared	0.24	0.41	0.43	0.61	0.61	0.61	0.62	0.62	0.61
Year Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Note: SA3-level clustered standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1, Δ indicates first difference. Models 3 includes initial local area attributes and lagged local area characteristic, Model 4 and 5 further include the time-varying local area characteristics. Model 6 excludes unemployment rate. Model 7 to 9 includes interactions to capture further impacts.*

We find a strong correlation between the current geographic distribution of migrants and the past settlement patterns.

- Model [4], [5], and [6] – include most of the local area controls & the estimated beta coefficient ranges from 0.735 to 0.773.
- Models [7], [8], and [9] – [6] plus 3 interaction variables to measure the simultaneous effect of the migration inflow ratio & different types of SA3 regions – i.e., the Rest of State Statistical Areas, the Greater Capital Cities of Sydney and Melbourne, and finally the Greater Brisbane Capital City.
- Metropolitan versus nonmetropolitan-region effects.
- Worsen the quality of life – overcrowding
- Increasing the cost of services – education, health

OLS Estimation Results

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Migrants at t-1/Resident Population at t-2	**0.453*** [0.023]**	**0.382*** [0.045]**	**0.623*** [0.061]**	**0.619*** [0.065]**	**0.583*** [0.067]**	**0.631*** [0.061]**	**0.626*** [0.062]**	**0.486*** [0.068]**	**0.637*** [0.070]**

IV Estimation Results

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Migrants at t-1/ Resident Population at t-2	**0.429*** [0.022]**	**0.406*** [0.048]**	**0.721*** [0.066]**	**0.773*** [0.103]**	**0.735*** [0.111]**	**0.767*** [0.102]**	**0.731*** [0.102]**	**0.617*** [0.106]**	**0.806*** [0.127]**

Internal Migration Inflows and House Price Changes: Effect of controlling for housing supply on the estimates

*[We also instrument housing approvals with the migration-driven population shock calculated by the number of **new** migrants at t-1 divided by total resident population at t-1]*

IV Estimation Results

Variables	[3]	[4]	[5]	[6]	[7]	[8]	[9]
Migrants at t-1/ Resident Population at t-2	**0.795*** [0.115]**	**0.620*** [0.124]**	**0.721*** [0.121]**	**0.743*** [0.116]**	**0.775*** [0.130]**	**0.636*** [0.121]**	**0.755*** [0.125]**
Log of Land Area	-0.008*** [0.001]	-0.009*** [0.001]	-0.009*** [0.001]	-0.008*** [0.001]	-0.007*** [0.001]	-0.006*** [0.001]	-0.008*** [0.001]
Coastal Dummy	0.006 [0.005]	0.005 [0.004]	0.004 [0.004]	0.005 [0.004]	0.008** [0.004]	0.007* [0.004]	0.004 [0.004]
Number of Dwellings Approved at t-1/Population at t-1	0.092 [0.785]	0.364 [0.715]	-1.080 [0.834]	-1.009 [0.847]	-1.631* [0.929]	-1.447* [0.820]	-0.964 [0848]
Unemployment Rate at t-1	0.002*** [0.001]	0.002** [0.001]	0.002** [0.001]				
Δ Log Median Wage at t-1		1.130*** [0.229]	1.172*** [0.258]	1.171*** [0.256]	1.142*** [0.266]	1.166*** [0.265]	1.175*** [0.253]
Δ Log Number of Jobs at t-1			0.382** [0.178]	0.382** [0.181]	0.440** [0.179]	0.397** [0.175]	0.375** [0.189]
Rest of States *[Migrants$_{t-1}$/Resident Population$_{t-2}$]					-0.194*** [0.043]		
Sydney & Melbourne *[Migrants$_{t-1}$/Resident Population$_{t-2}$]						0.292*** [0.0642]	
Brisbane *[Migrants$_{t-1}$/Resident Population$_{t-2}$]							-0.027 [0.058]
Observations	877	877	877	877	877	877	877
R-squared	0.59	0.61	0.62	0.61	0.62	0.62	0.61
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap - Migration	57.07	54.77	39.49	38.28	34.92	39.29	44.51
Kleibergen-Paap - Demand Driven Shock	53.58	51.34	40.02	39.77	36.96	42.78	36.18

*Note: SA3-level clustered standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1, Δ indicates first difference. Model 1 and 2 are not included in the Table as those models only include one control in their original specifications. Therefore, due to the inclusion of another instrument (two instruments simultaneously), model 1 and 2 in this setup are not identical to their benchmarks.*

Following Saiz (2010), *Quarterly Journal of Economics.*

The coefficients generally remain very similar to the baseline estimates.

To conclude:

- There is a local economic impact of internal migration; internal migration increases house prices in migration-receiving areas;
  - The median house sales price across 237 SA3 areas ranges from $360,000 to $1,117,500
  - Therefore, an annual increase in migrants equal to 1% of an SA3 region's initial population leads to $2,772 to $8,605 annual increase in house prices with the beta estimate of 0.77%.
- It is possible to argue that housing prices across three states of Australia would have been around 0.7% – 0.8% lower per annum had there has been no internal migration.

To conclude:

- Migrants seem to be price – sensitive.
- Our empirical findings provide sufficient evidence for rejecting the claims of the property market experts.
- Our findings are in terms of magnitude are in line with the previous research done for China, New Zealand, and Sweden.

Thank you!