



Distributional Consequences of Monetary Policy: Evidence from Local Housing Markets

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Reserve Bank of Australia

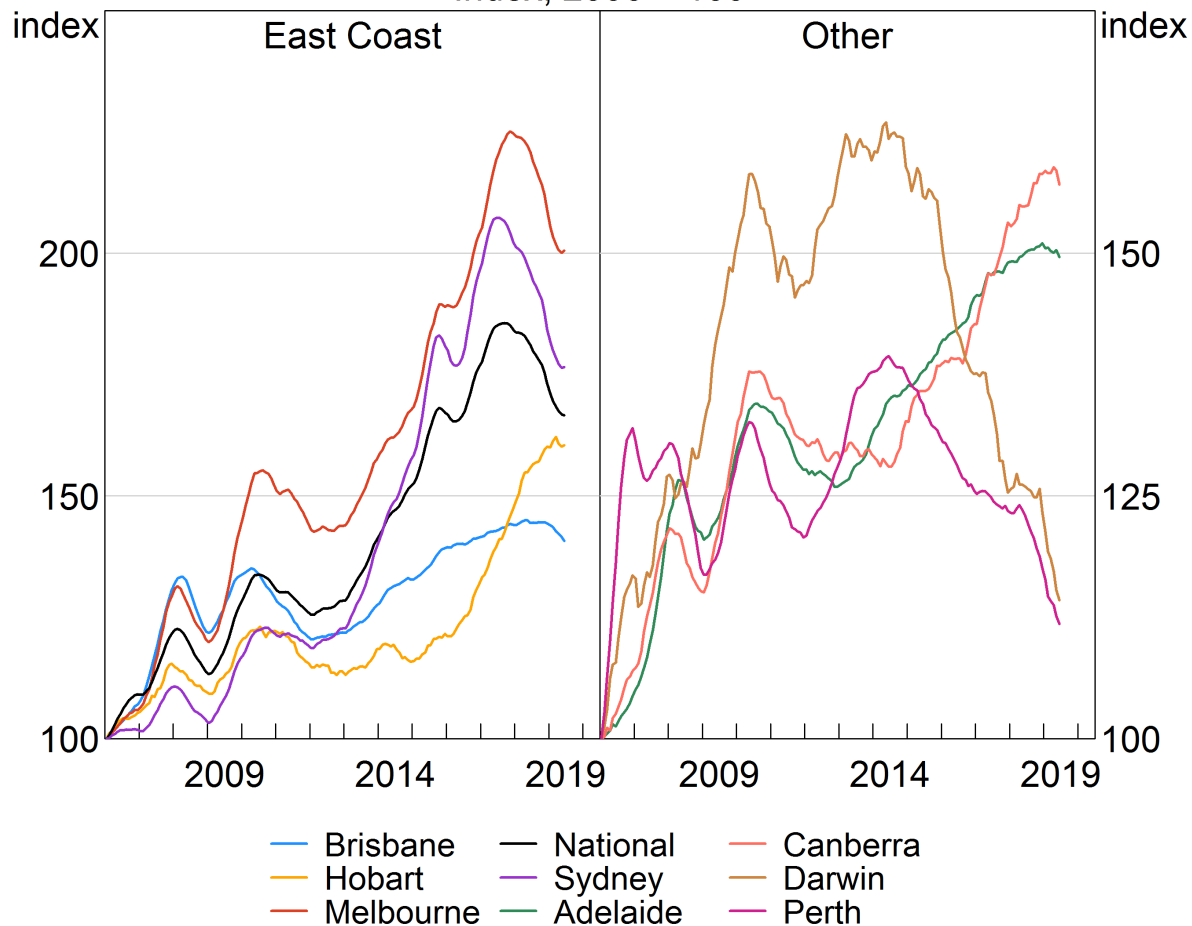
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Motivation

- *'It is pretty clear that there is no such thing as the Australian housing market. What we have is a series of separate, but interconnected, markets.'*
 - *RBA Governor Lowe, March 2019*

Australian Housing Prices

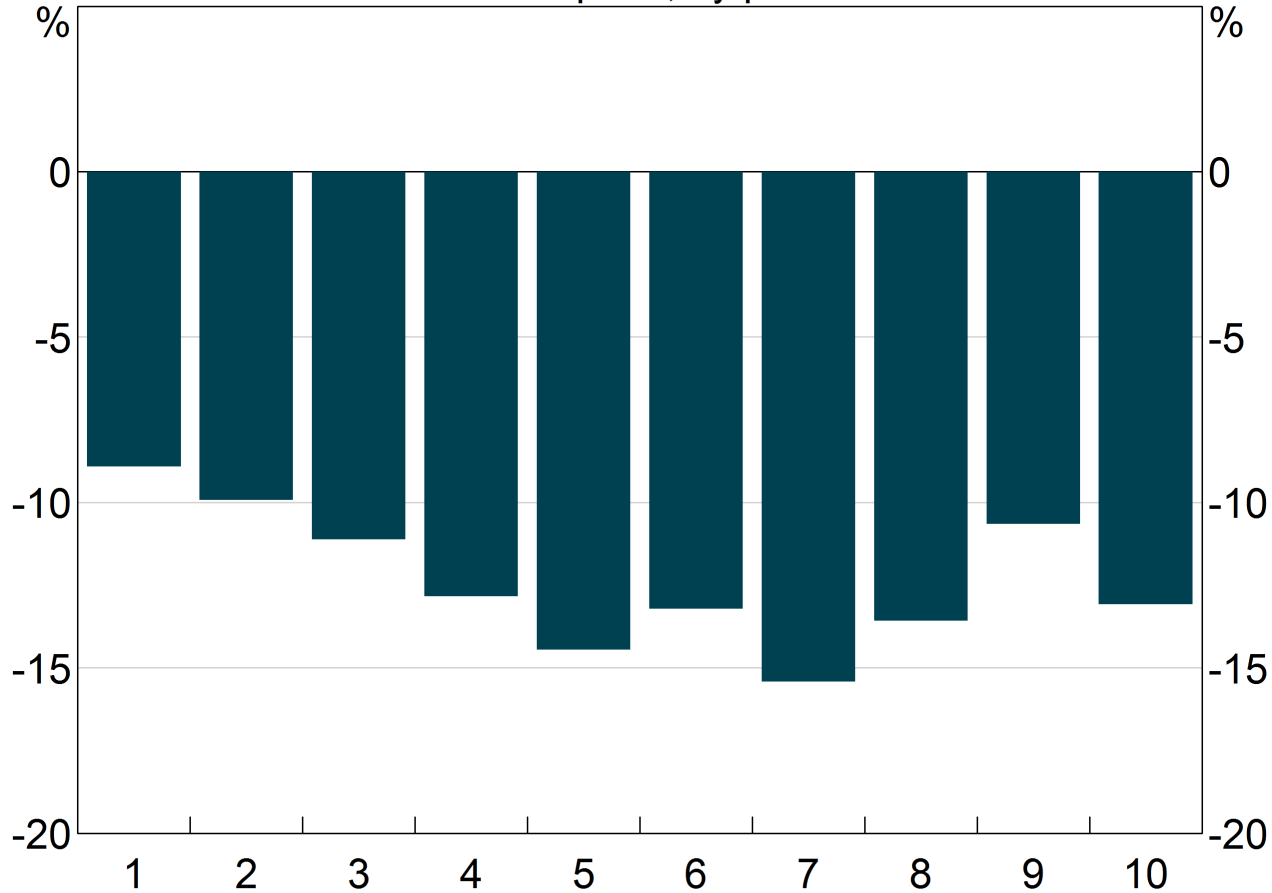
Index; 2006 = 100



Sources: CoreLogic®; RBA

Sydney Housing Price Declines

From market peak; by price decile



Sources: CoreLogic®; RBA

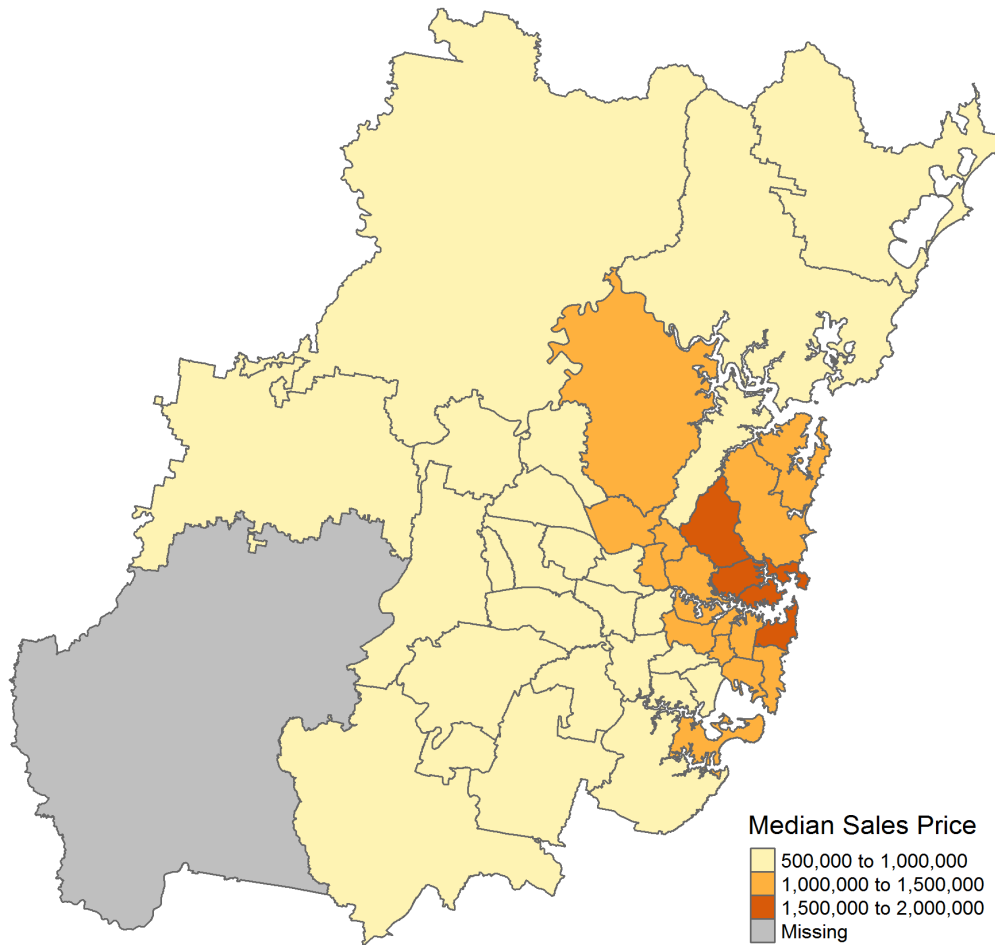
Question

- Does monetary policy affect housing prices heterogeneously across regions?
- If so, why?

Data

- Local housing market data at Statistical Area Level 3
 - 351 SA3 regions in Australia
 - Think Local Government Area
- Hedonic housing price indices from 1980

Greater Sydney



Identification

- Exploit local area variation
- Panel regressions + local projection

Identification

$$\ln(P_{i,t+h}) - \ln(P_{i,t}) = \alpha_i + \sum_g \beta_{g,h} \Delta \text{Cash Rate}_t * \text{Price Group}_g + X_{i,t} + \epsilon_{i,t}$$

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But this could produce biased results...

Better Identification

$$\ln(P_{i,t+h}) - \ln(P_{i,t}) = \alpha_i + \gamma_t + \sum_{g \neq b} \beta_{g,h}^* \Delta \text{Cash Rate}_t * \text{Price Group}_g + X_{i,t} + \epsilon_{i,t}$$

$$\text{where } \beta_{g,h}^* = \beta_{g,h} - \beta_{b,h}$$

- Remove a benchmark group (b)
- γ_t are time fixed effects – absorb benchmark group
- Assumption: No variable that cash rate systematically responds to that has a heterogeneous effect on housing prices across regions. Bias across regions is the same.

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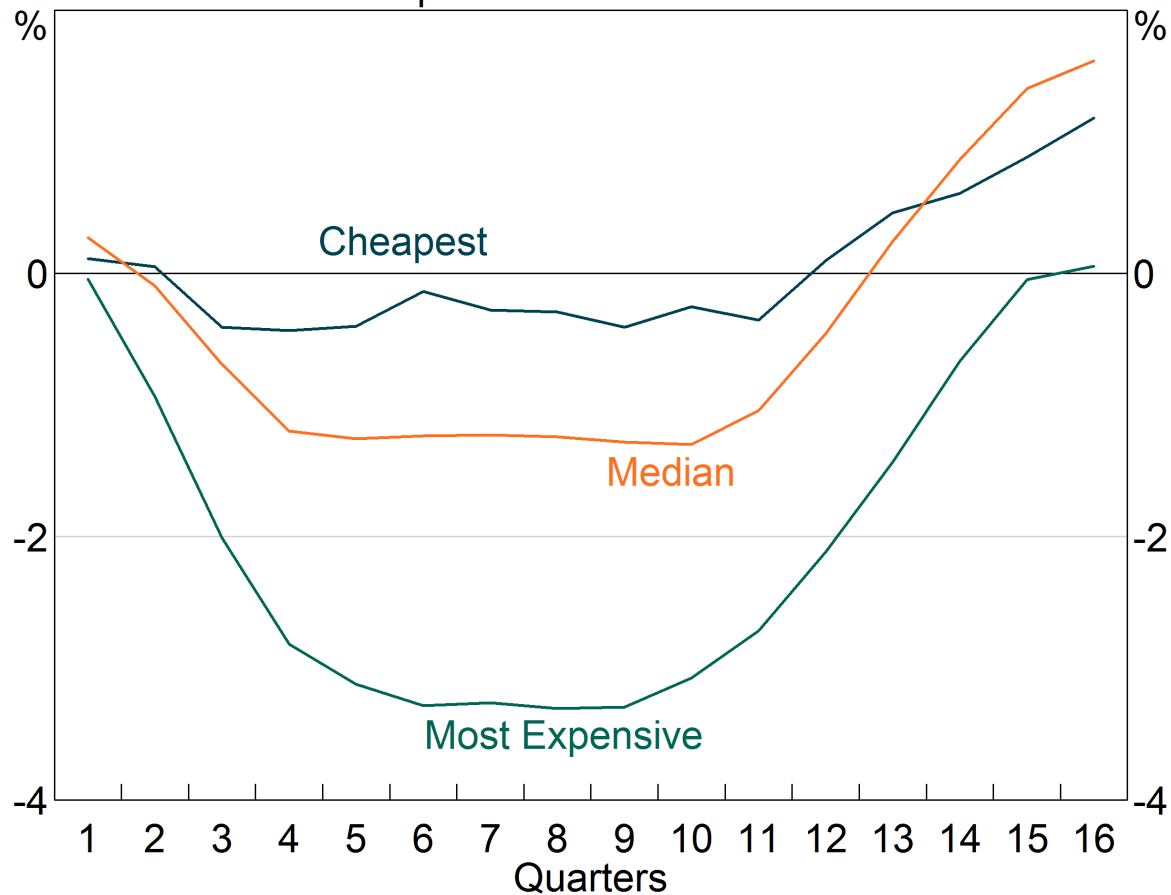
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- $\beta_{g,h}^*$ = Difference in response of group g to the benchmark group to a 100 basis point increase in the cash rate.

Results

Absolute Responses

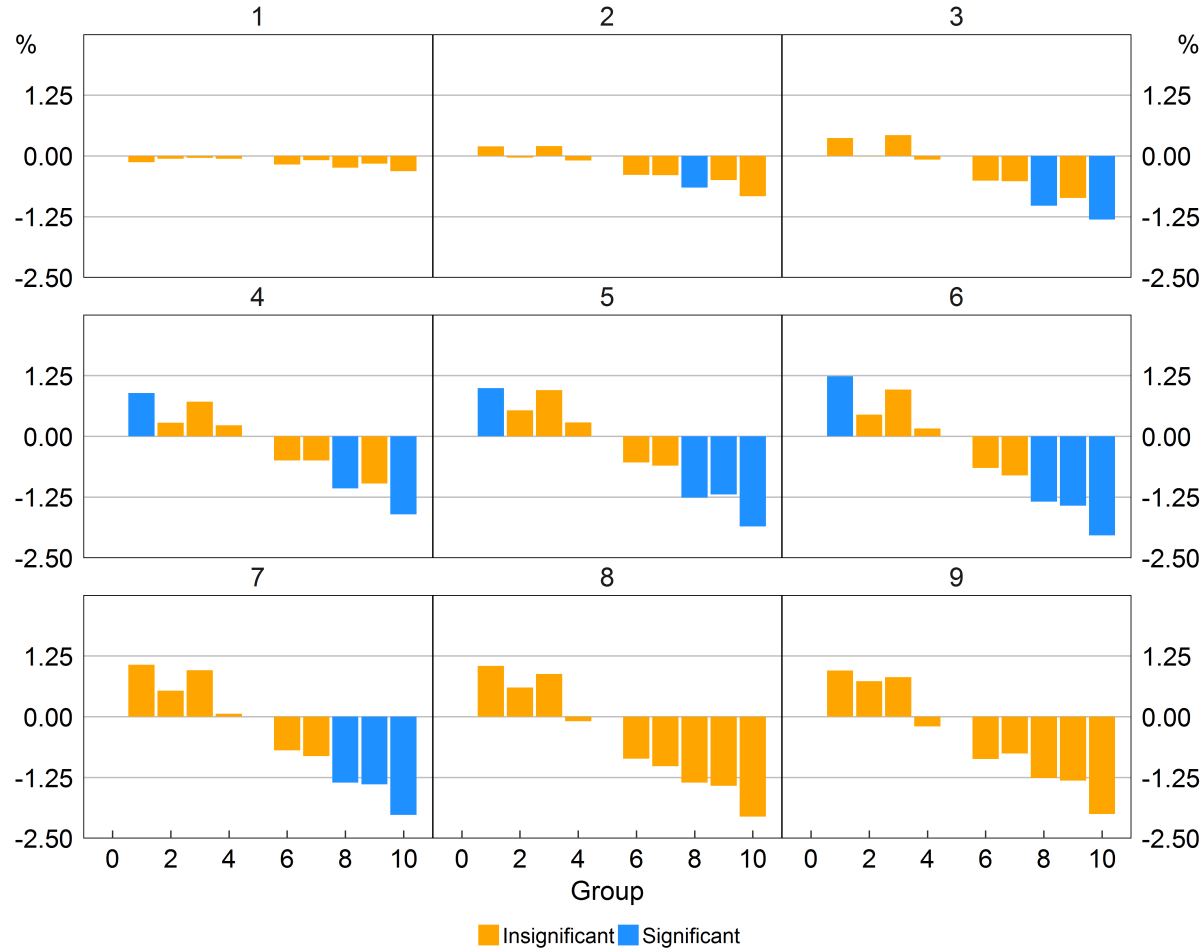
100 basis point increase in the cash rate



Sources: CoreLogic®; RBA

Differential Responses

Relative to median group; price deciles



Why?

Why?

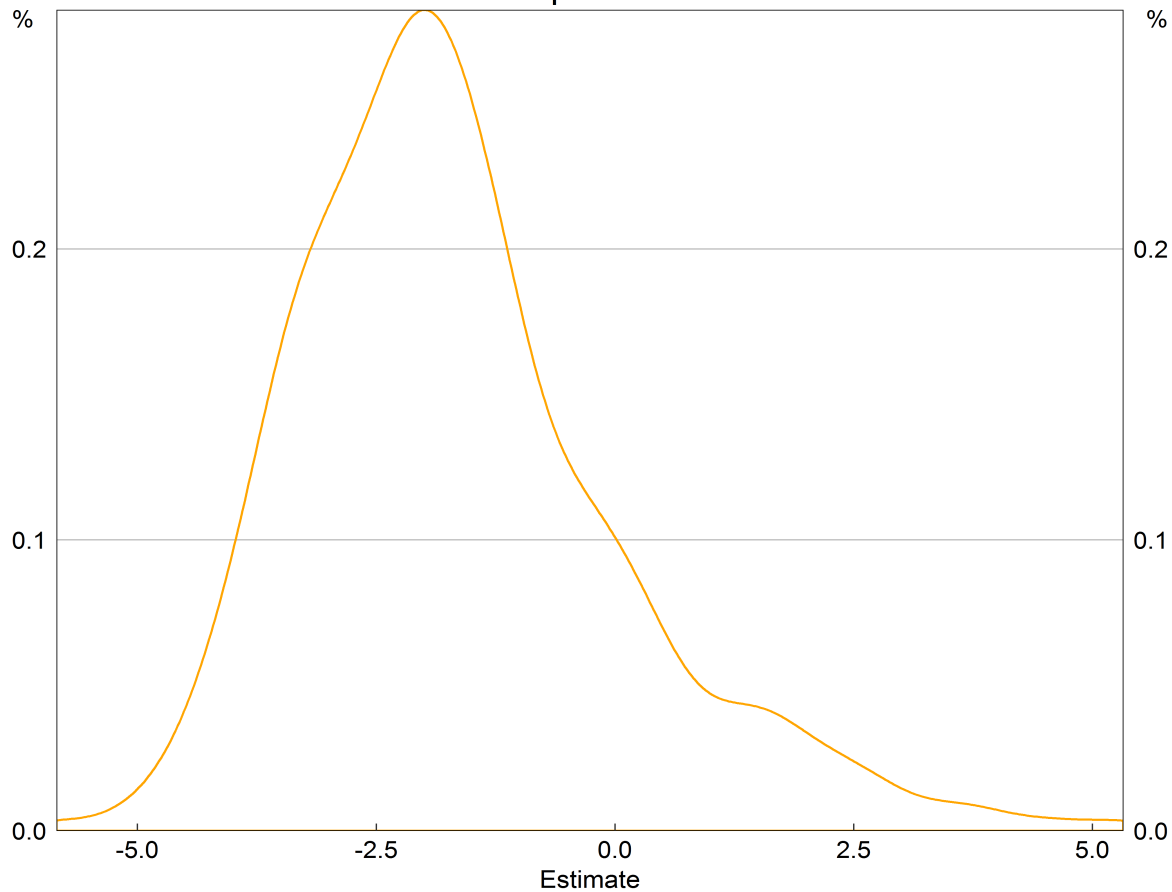
- Take the distribution of responses

$$\ln(P_{i,t+h}) - \ln(P_{i,t}) = \alpha_i + \beta_i \Delta Cash Rate_t + X_{i,t} + \epsilon_{i,t} \forall i$$

- Use model selection methods to pick factors that explain the *differential* in responses

Distribution of Responses

6 quarters



Sources: CoreLogic®; RBA

Other factors

- Collect around 40 variables related to:
 - Density
 - Income
 - Wealth
 - Supply measures
 - Hand to mouth
 - Age
 - Property status
 - State

LASSO, Elastic Net and Least Angle Regression

- Model shrinkage methods
 - LASSO and Elastic Net – penalised regression
 - Least Angle Regression – ‘democratised stepwise’

Variables chosen

	Variable	More or less responsive
1	Population density	More
2	Average investment income	More
3	Household net worth	More
4	Investor density	More
5	Western Australia	More
6	Per cent of people earning between \$1-\$499	Less
7	Per cent of people on government benefits	Less
8	Proportion of value determined by 'structure'	Less
9	New South Wales	Less

Supply can partially explain the differentials...

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Ability to invest matters

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Hand-to-mouth households matter

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Some states are different...

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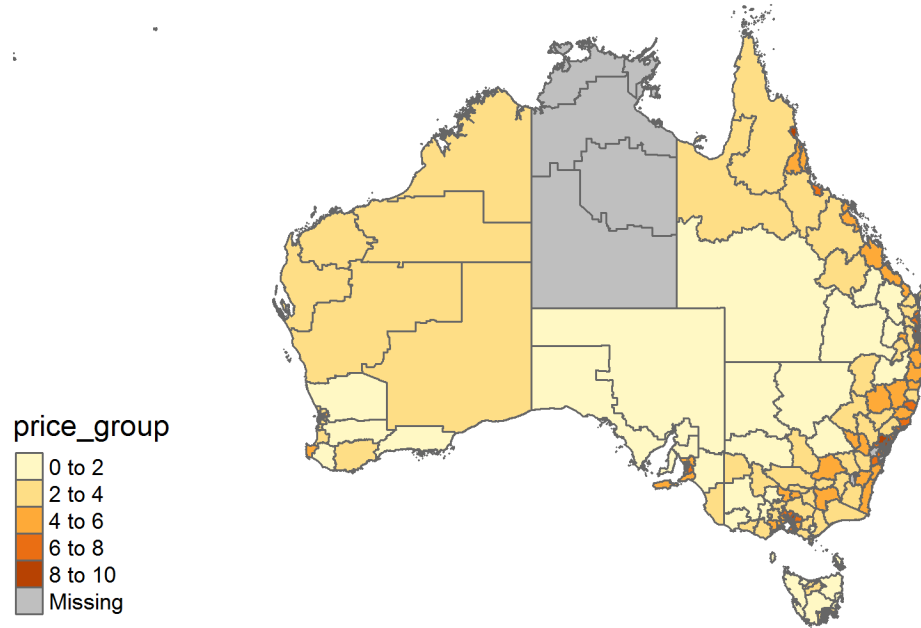
Summary

- Monetary policy temporarily changes the distribution of housing wealth
 - An increase in the cash rate will drive larger decreases in housing prices in more expensive areas and vice-versa
 - Effect is temporary
- Why?
 - 1) Areas with more wealth and investors appear to be more sensitive to monetary policy → leverage or discount factor channel
 - 2) Areas with more hand to mouth individuals are less sensitive → consistent with Kaplan and Violante (2019)
 - 3) Supply constraints may explain some of the differentials but probably not the complete story

Questions

Spares

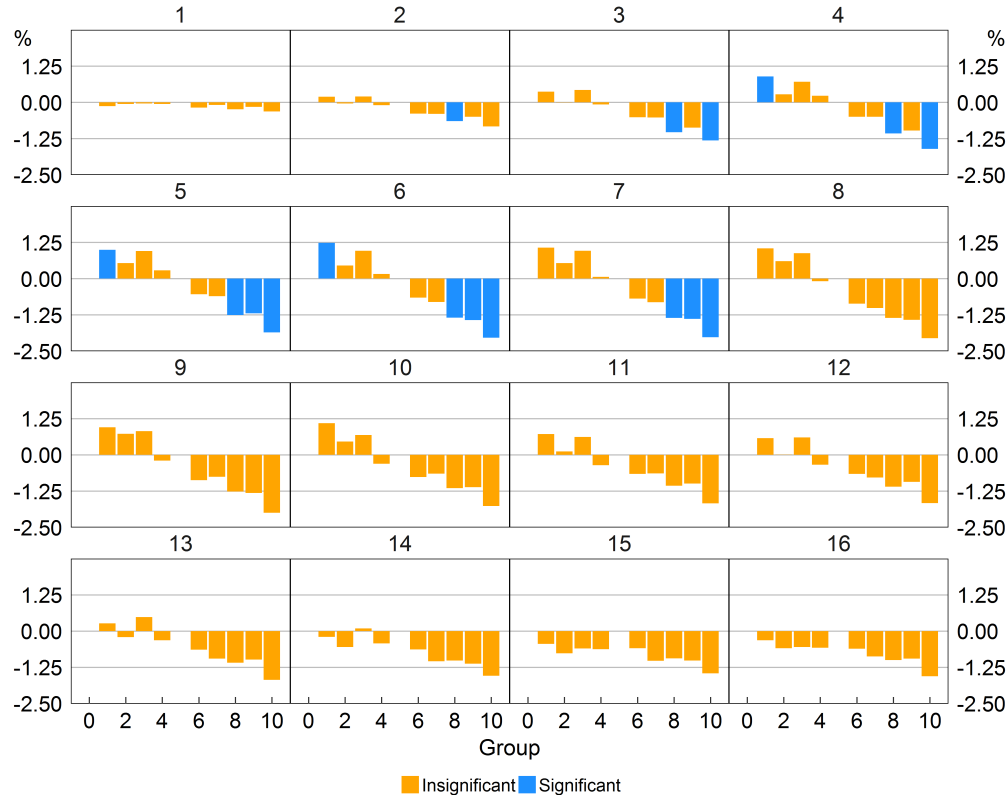
Price Groups



All 16 quarters

Differential Responses

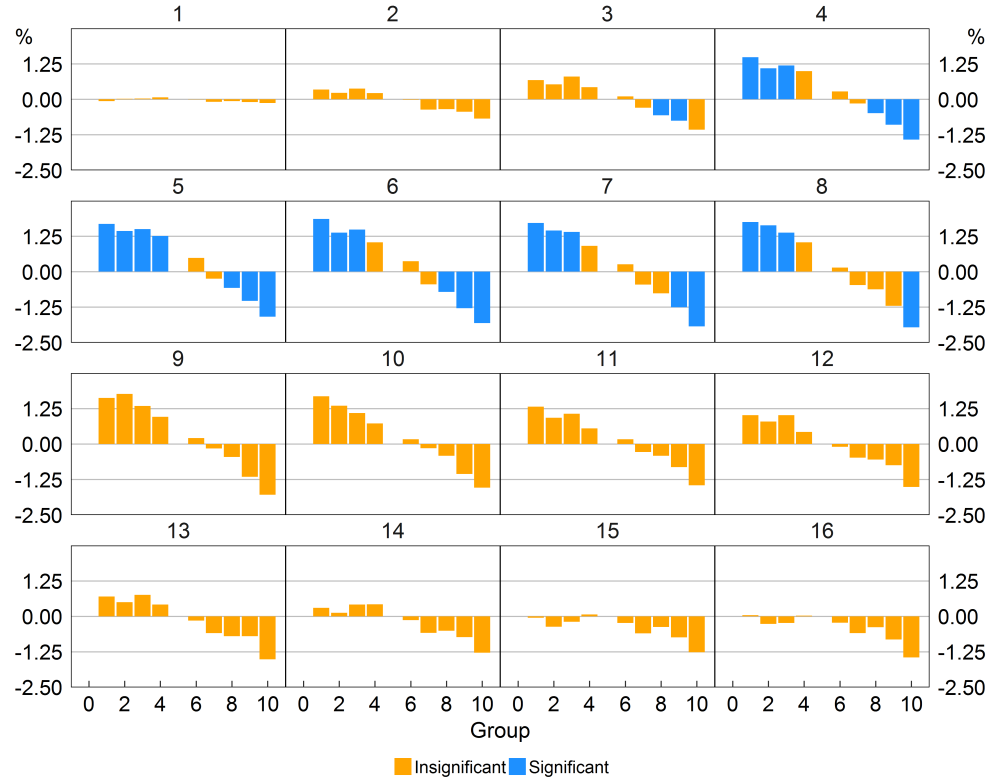
Relative to median group; price deciles



Detached Houses Only

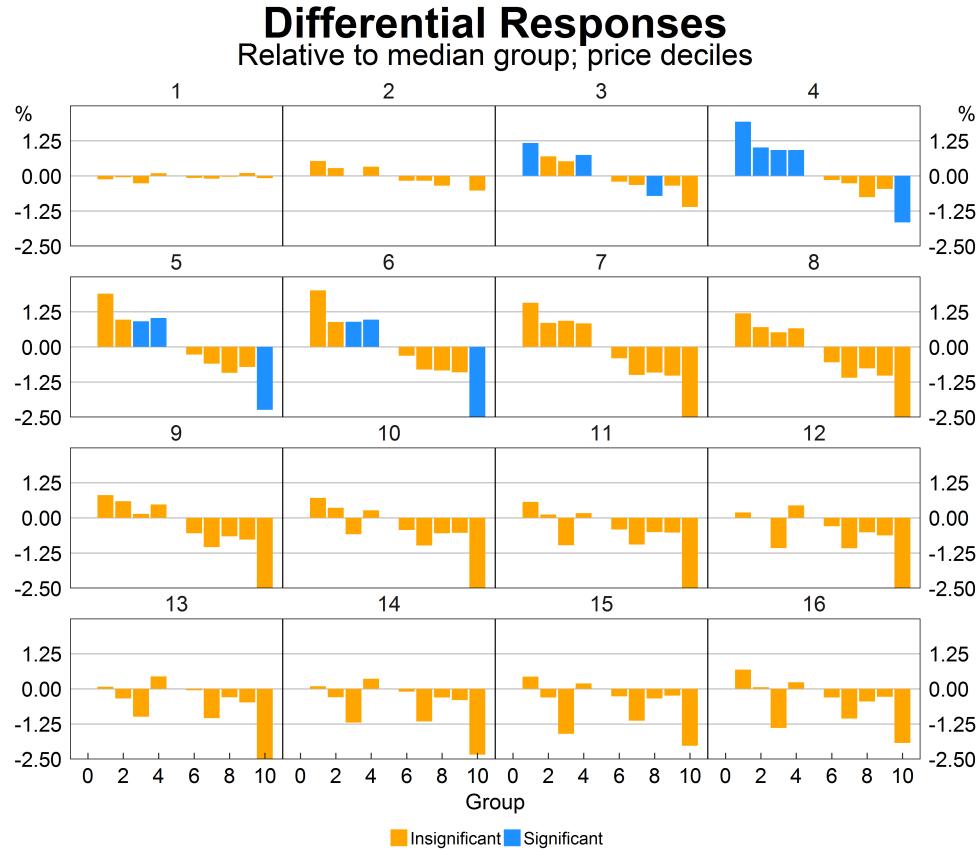
Differential Responses

Relative to median group; price deciles



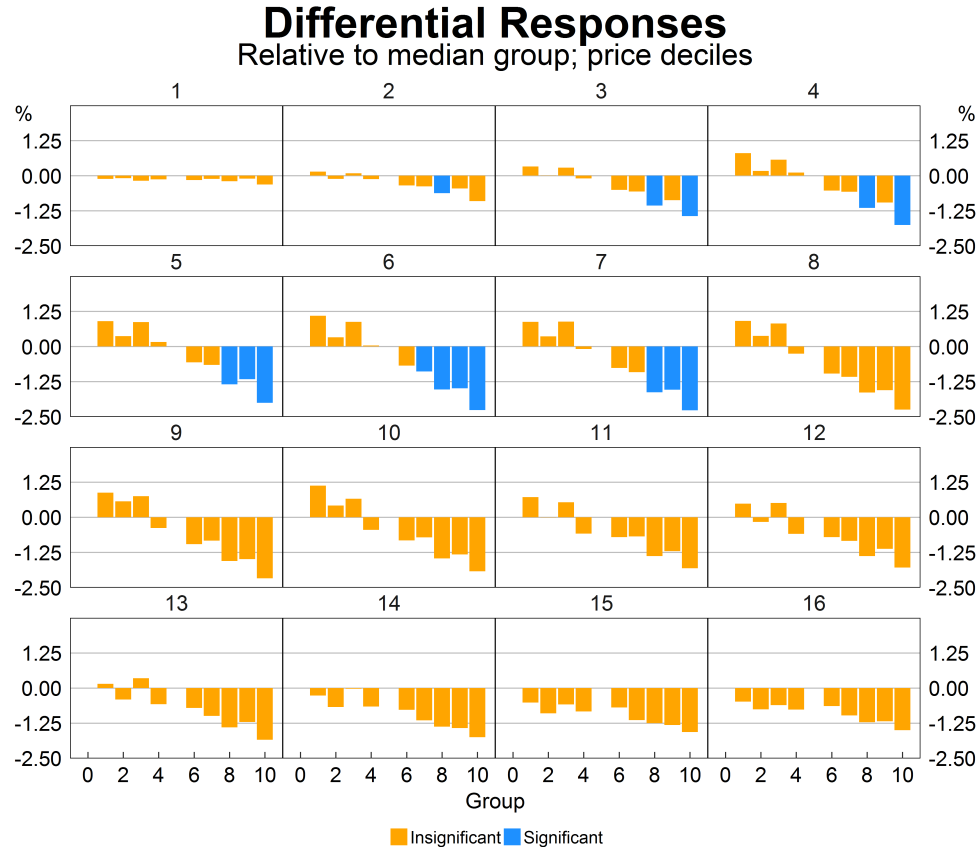
Sources: CoreLogic®; RBA

With extra controls



Sources: CoreLogic®; RBA

With AR terms

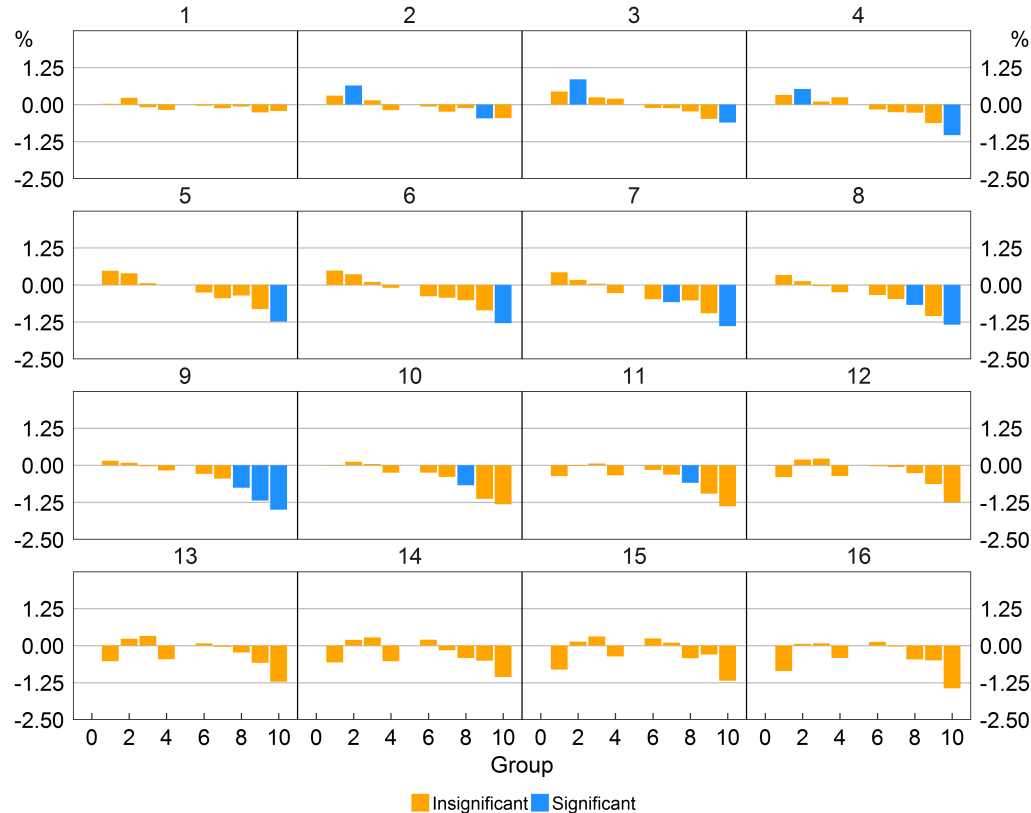


Sources: CoreLogic®; RBA

Metropolitan regions only

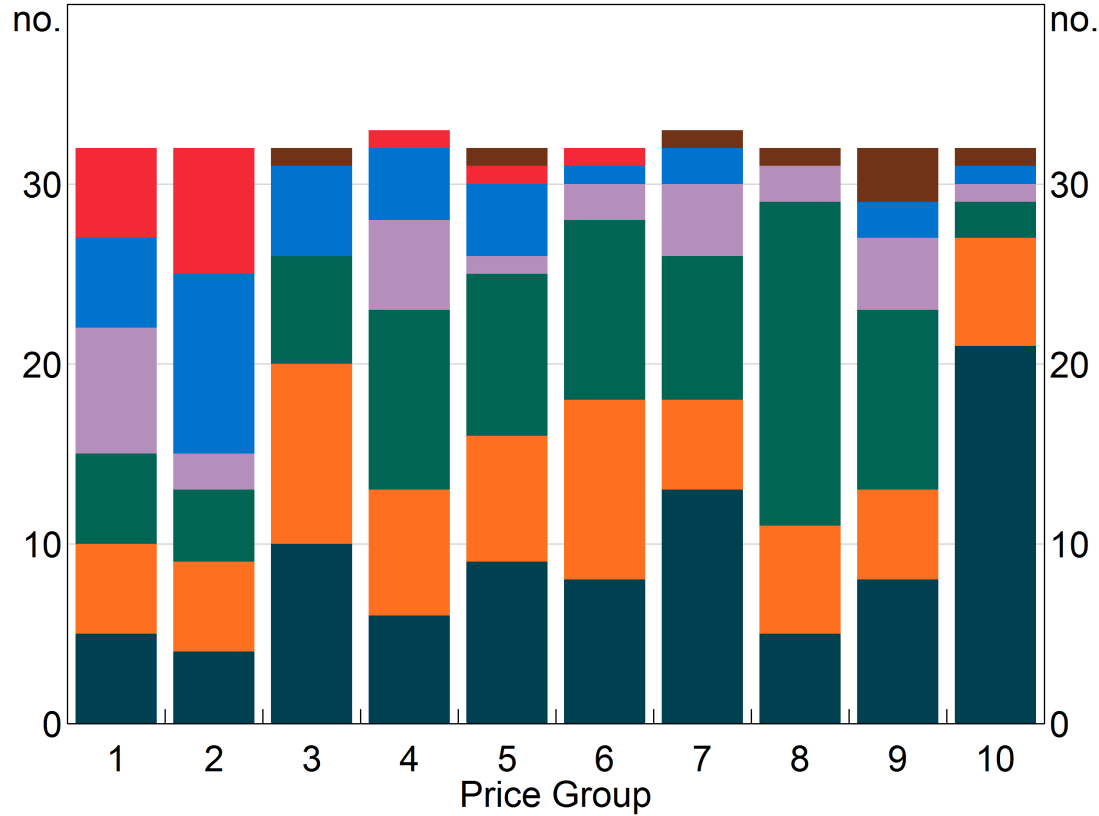
Differential Responses

Relative to median group; price deciles



Composition of Price Groups

Price deciles



■ NSW ■ QLD ■ WA ■ ACT
■ VIC ■ SA ■ TAS

Sources: CoreLogic®; RBA

Another methodology

Identification

- Romer and Romer style monetary policy shocks

$$\text{Cash Rate}_t = \alpha + \text{RBA Forecasts}_t + \text{Credit Spreads}_t + \epsilon_t$$

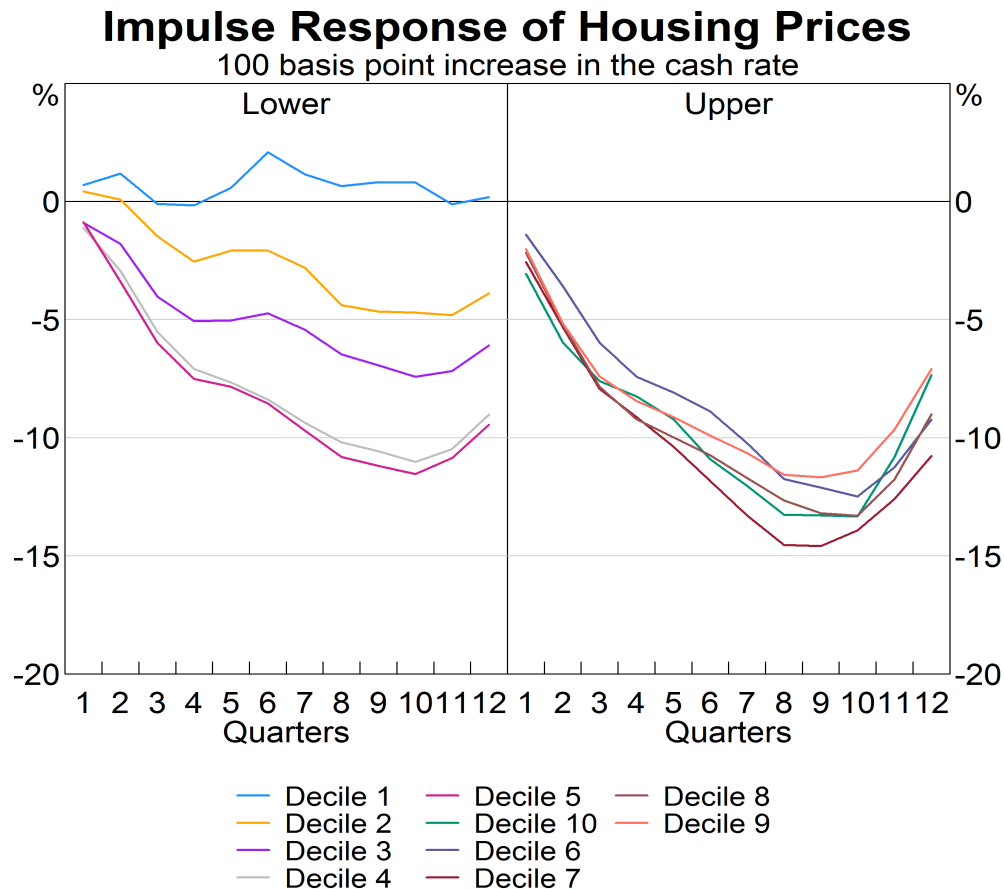
- RBA forecasts of GDP, inflation, unemployment and housing prices.
- Credit spreads

By price group

$$\ln(P_{i,t+h}) - \ln(P_{i,t}) = \alpha_i + \sum_{j=1}^{10} \beta_j MPShock_t * D_j + X_{i,t} + \epsilon_{i,t}$$

- D_j = dummy variable if region i is in price decile j
- $X_{i,t}$ contains lags of the monetary policy shocks.

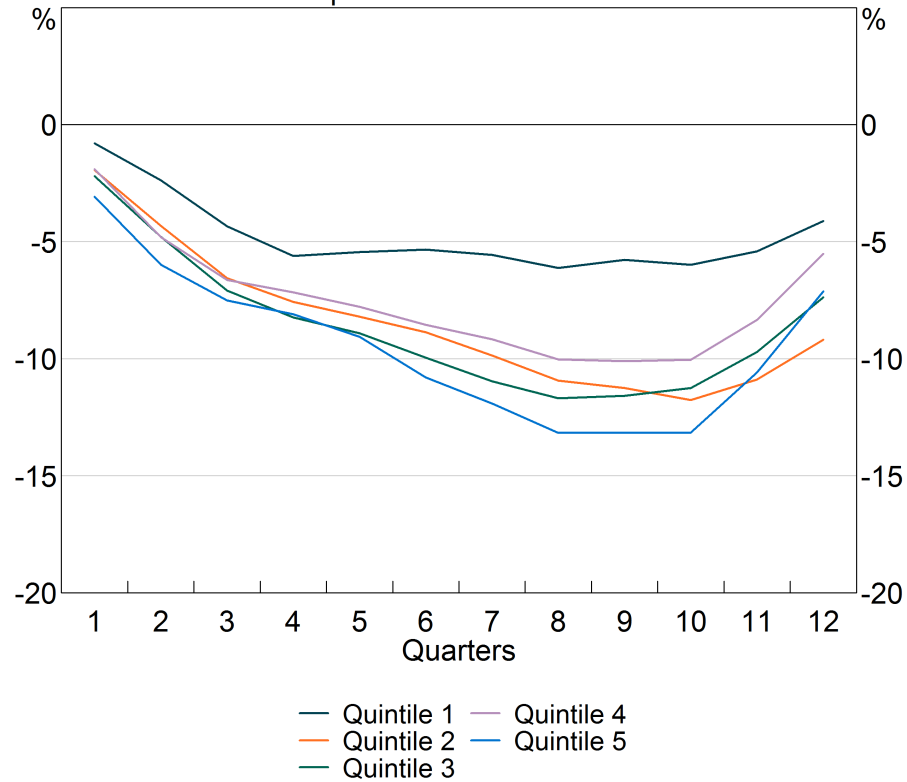
All regions



Metropolitan only

Impulse Response of Housing Prices

100 basis point increase in the cash rate

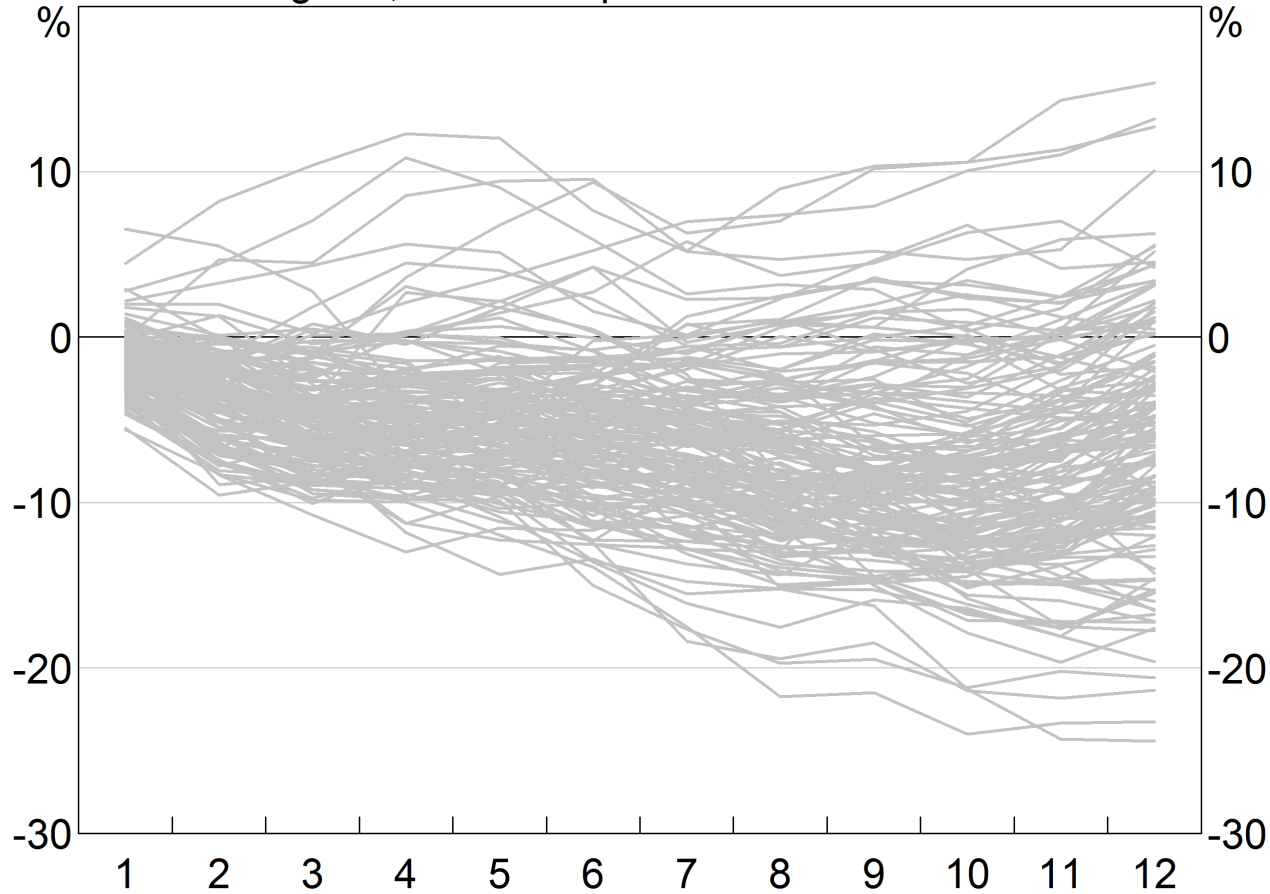


Sources: CoreLogic; RBA

Responses by region and state

Housing Prices Impulse Response

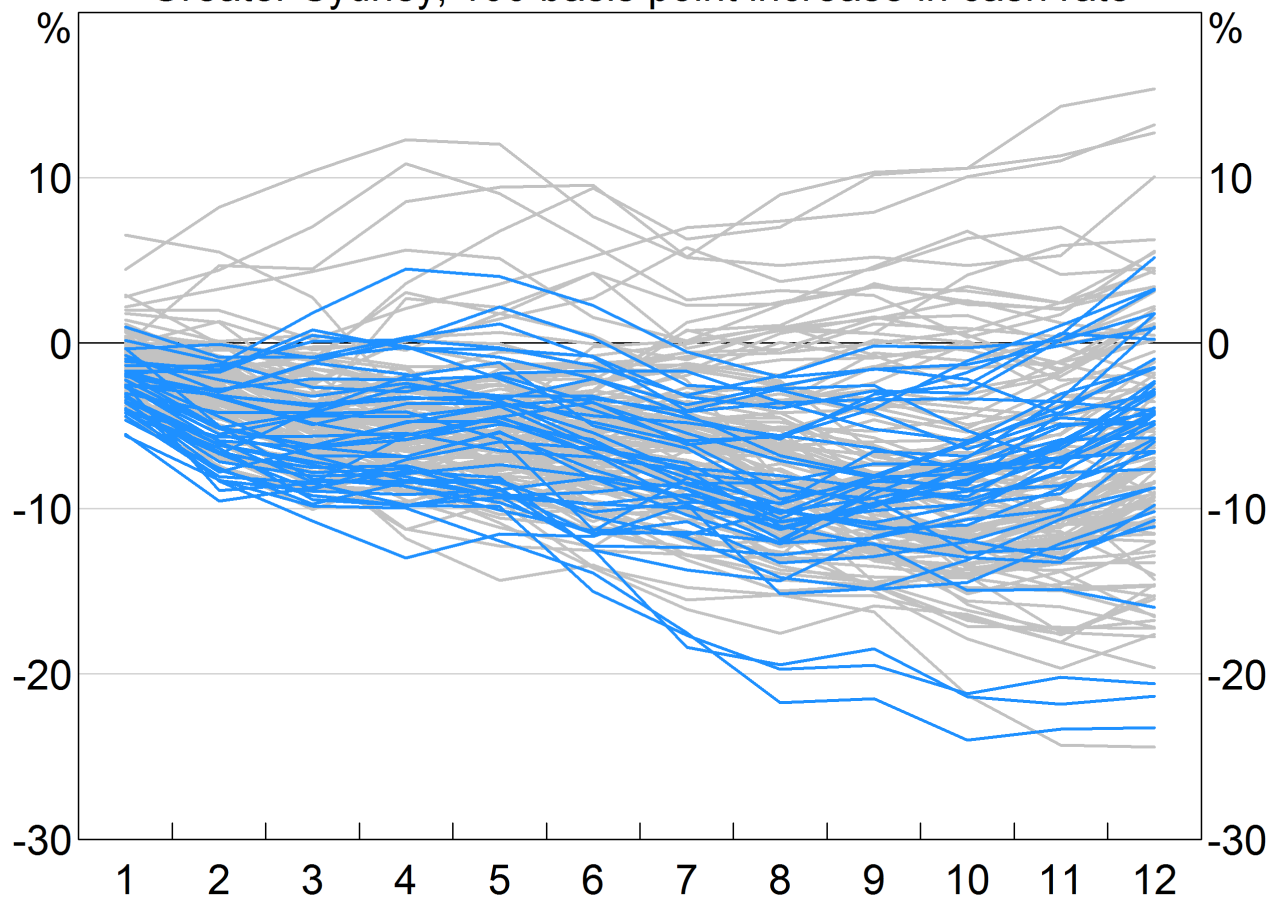
All regions; 100 basis point increase in cash rate



Sources: CoreLogic; RBA

Housing Prices Impulse Response

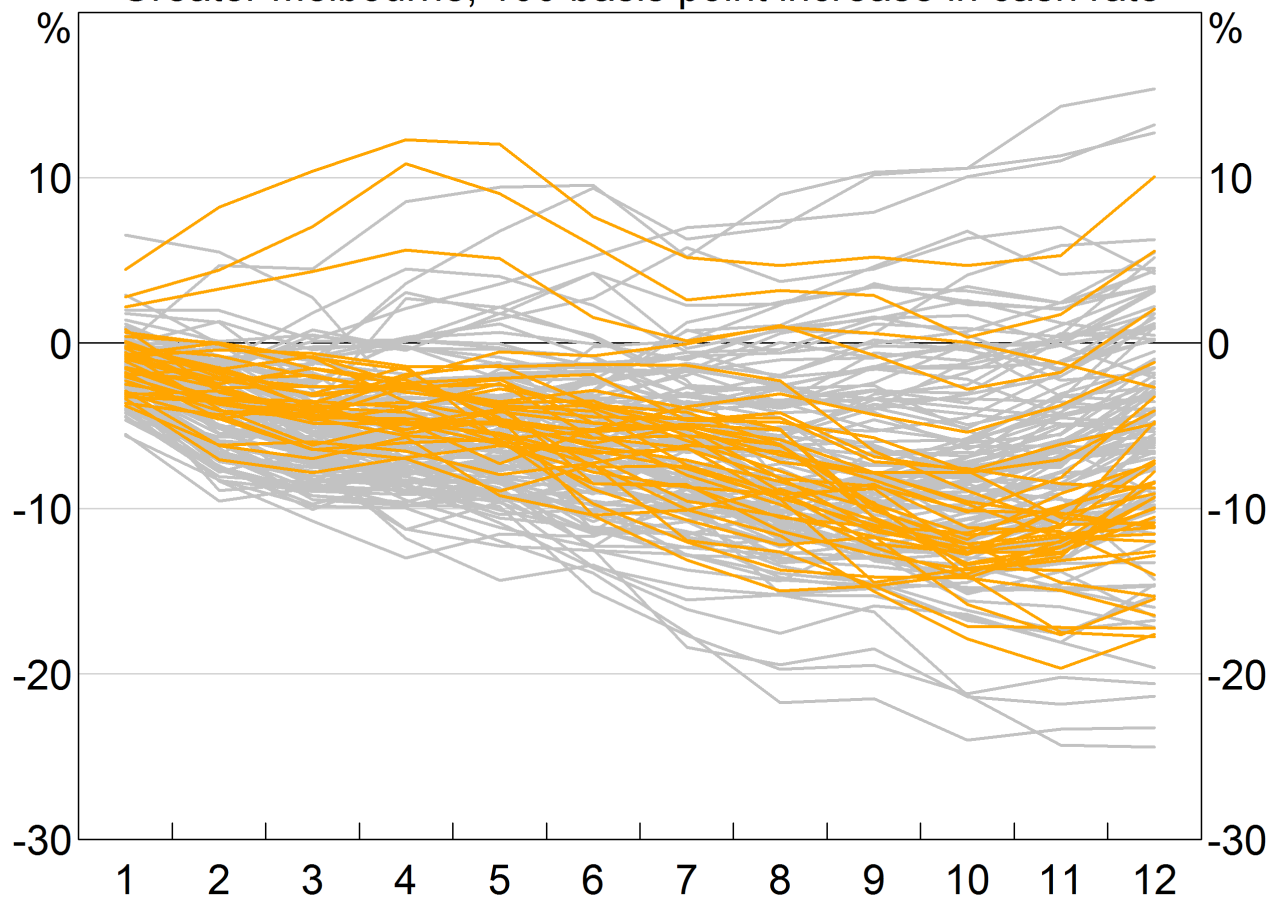
Greater Sydney; 100 basis point increase in cash rate



Sources: CoreLogic; RBA

Housing Prices Impulse Response

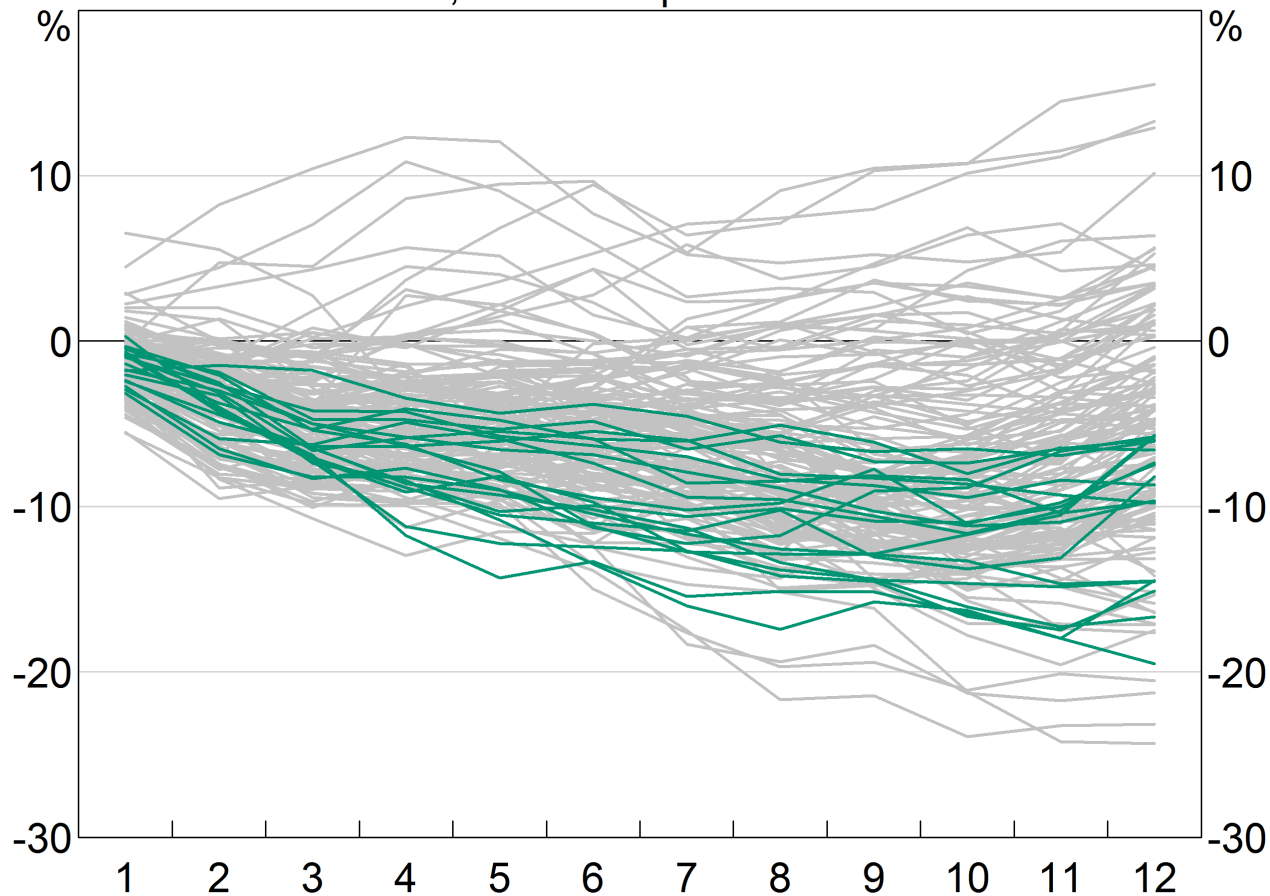
Greater Melbourne; 100 basis point increase in cash rate



Sources: CoreLogic; RBA

Housing Prices Impulse Response

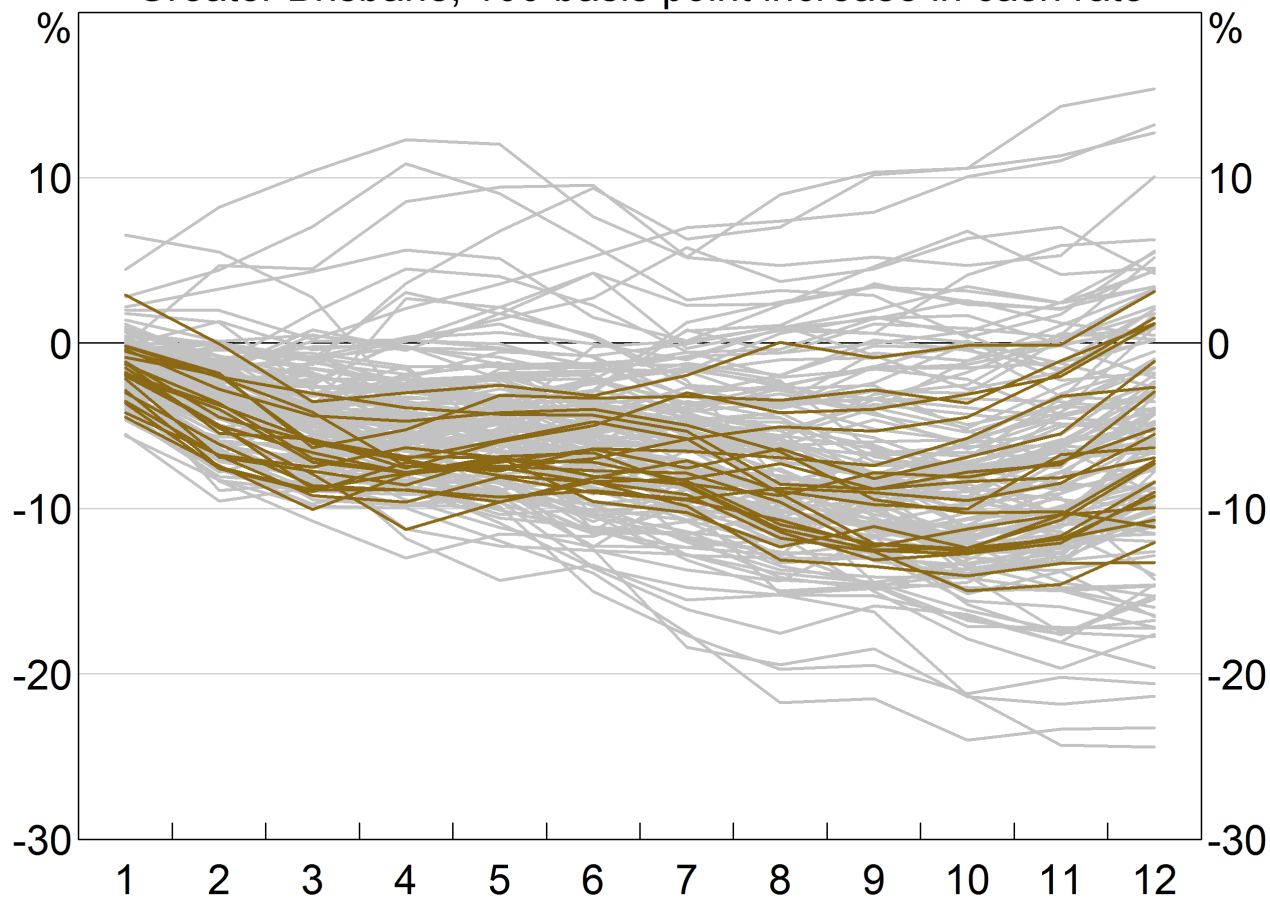
Greater Adelaide; 100 basis point increase in cash rate



Sources: CoreLogic; RBA

Housing Prices Impulse Response

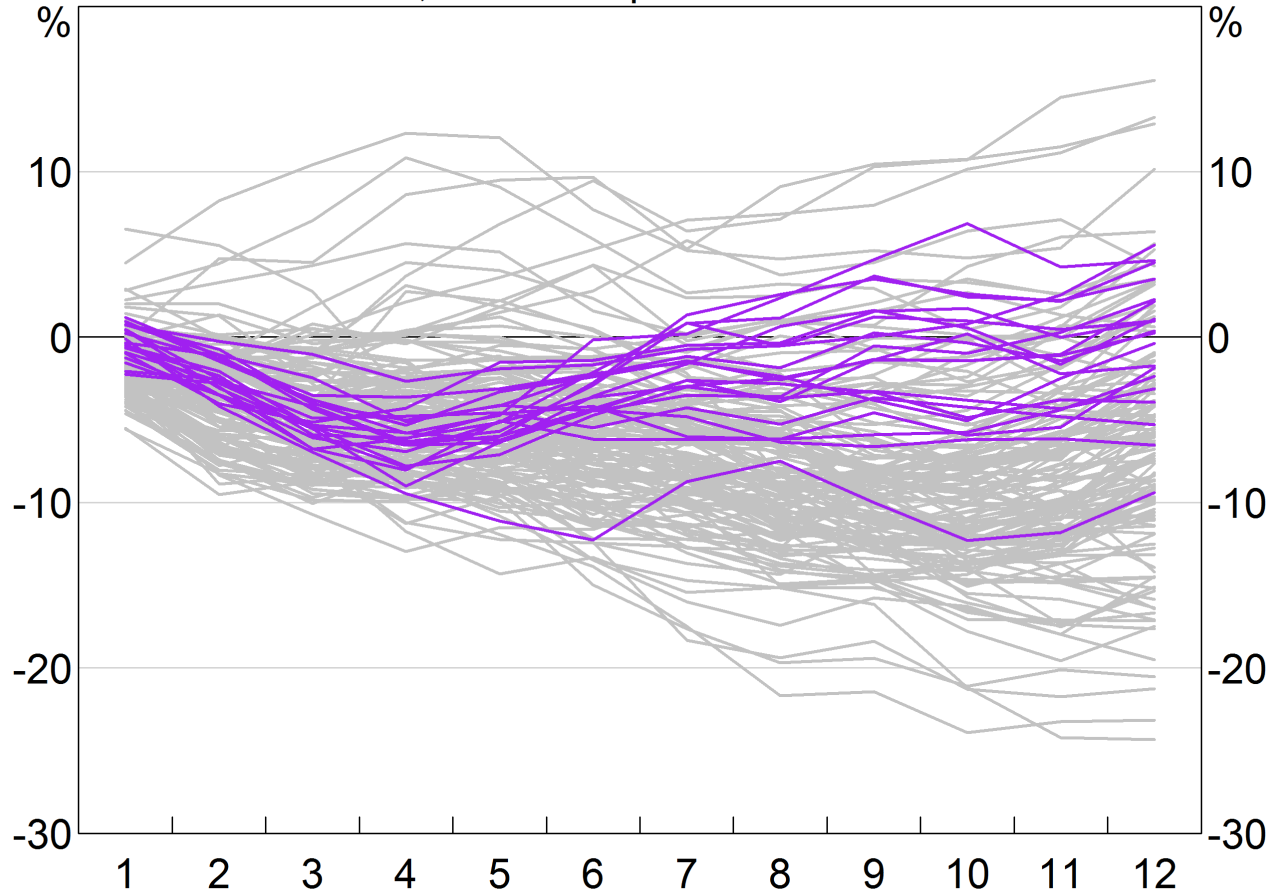
Greater Brisbane; 100 basis point increase in cash rate



Sources: CoreLogic; RBA

Housing Prices Impulse Response

Greater Perth; 100 basis point increase in cash rate



Sources: CoreLogic; RBA

Variation is state driven

- Implies demand response in states are different.
- Industry shares are a likely candidate explanation

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- *'Given these contrasting experiences, it is pretty clear that there is no such thing as the Australian housing market. What we have is a series of separate, but interconnected, markets.'* – Phil Lowe 2019

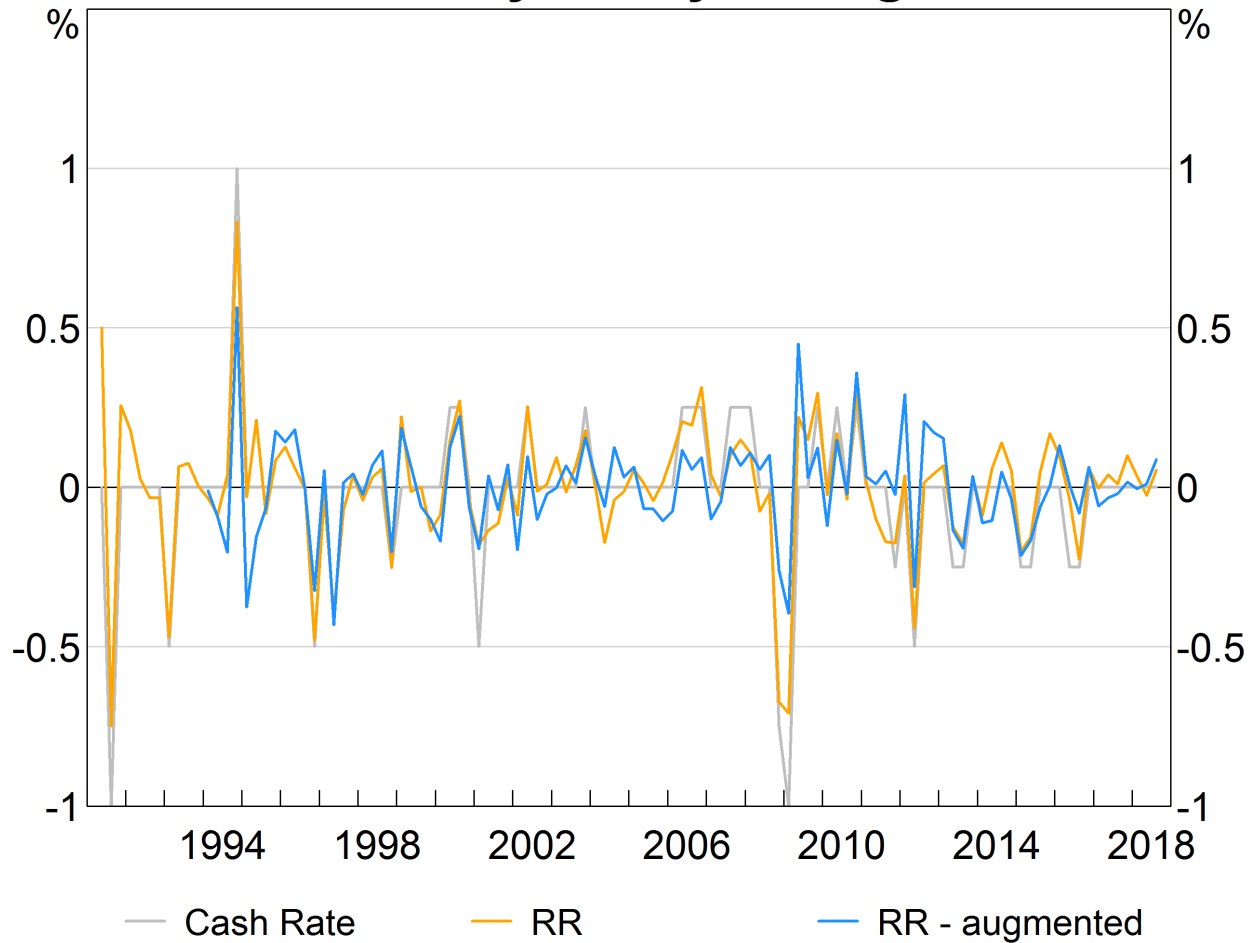
Elasticities

- What about supply elasticity differentials?

Elasticities

- What about supply elasticity differentials?
- Distribution of elasticities appears narrow (Bishop (forthcoming))

Monetary Policy Changes



Source: RBA

Motivation (why we care about distributions)

- The distribution can help identify the effects of monetary policy on housing
- Better understand the transmission of monetary policy
- The distribution can affect the aggregate
- Aggregate data produce imprecise estimates.