The effects of stamp duty on housing mobility: Evidence from a natural experiment in Queensland

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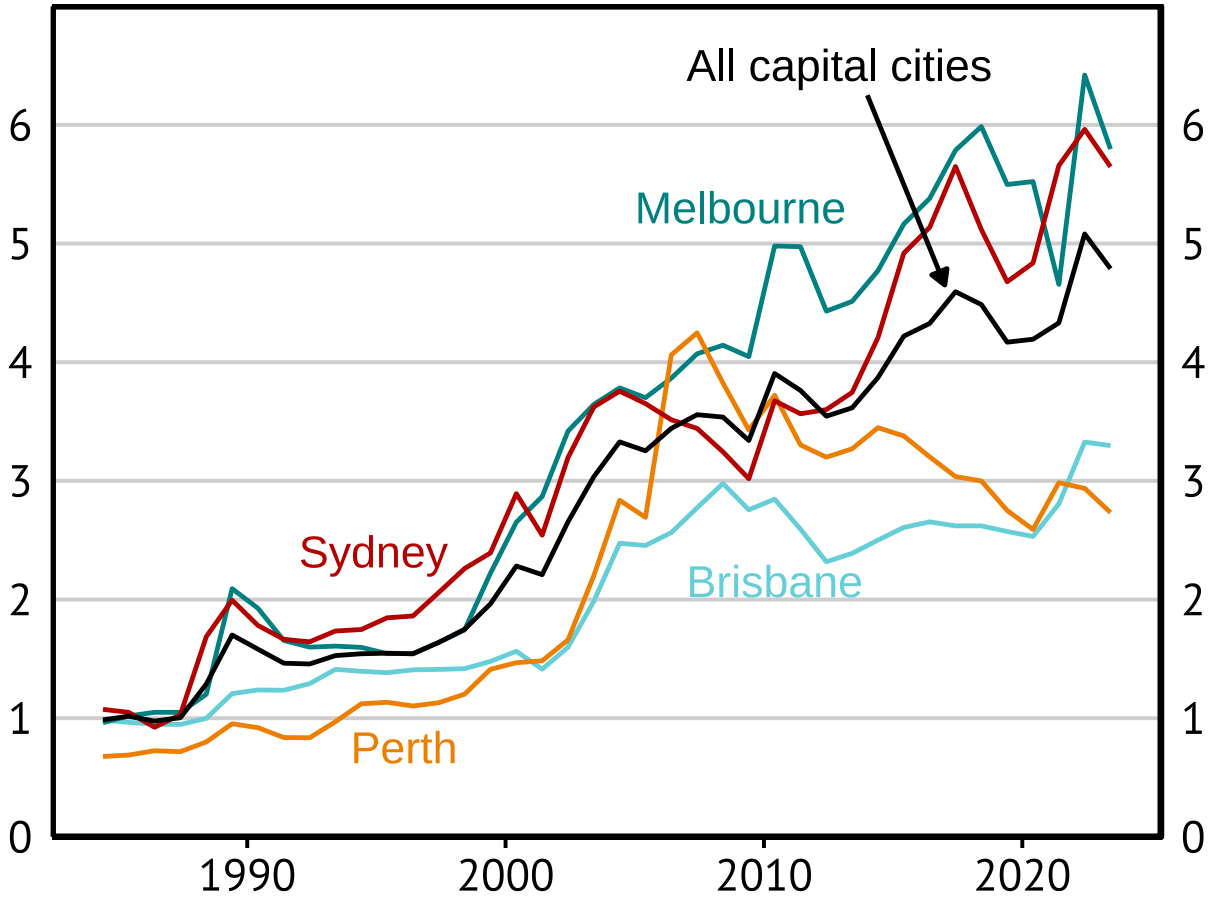
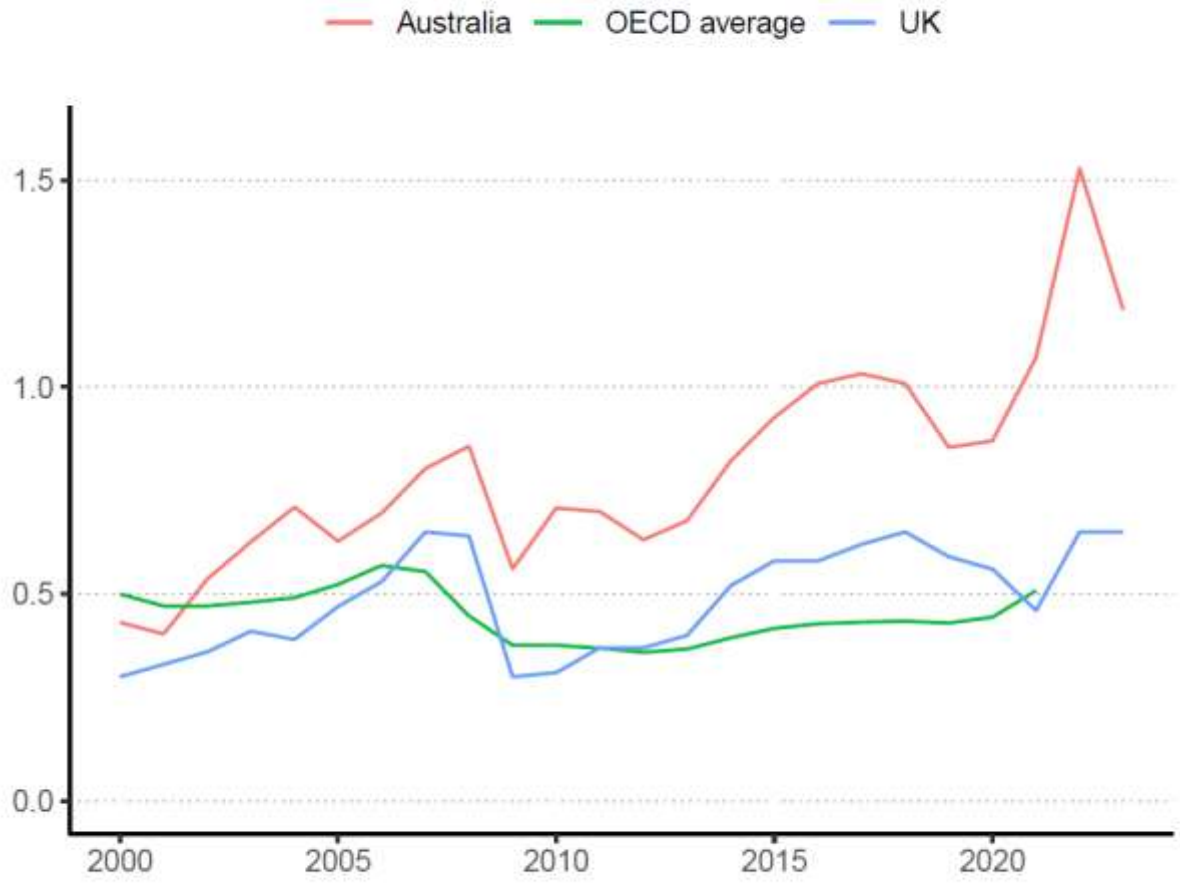
Stamp duty: a big tax on the mobility of homeowners

Stamp duty as months of income

Average after-tax income and a median-priced home



Stamp duty revenue as % of GDP



Sources: ABS; OECD; UK Office for Budget Responsibility.

Research questions

Housing mobility: What is the causal effect of higher stamp duty on home buying and homeowner moves?

- Exploit a natural experiment in Queensland in FY2012
- Use detailed micro data on housing transactions and moves

Housing prices: What is the effect of higher stamp duty on home prices?

- Not covered today but can share draft working paper!

Contributions

Past studies disagree about the effects of stamp duty

- Most find that **both home sales and prices fall** in response to higher stamp duty (e.g. Davidoff and Leigh 2013)
- But some find **large sales and price effects** (Best and Kleven 2018, Restud) while others find **small sales and price effects** (Besley, Meads and Surico (2014, JPubE)) even when analysing the same event (UK stamp duty holiday)

We contribute to the literature through…

- **Better identification**: Queensland's sudden tax change lets us isolate the causal effects (and its removal also lets us examine permanent/temporary effects)
- **Broader range of outcomes**: We study home moves, property sales and prices to get the full picture
- **More comprehensive data**: We look at 1) property transactions, 2) administrative data on locations, and 3) survey data on moves

We find that higher stamp duty sharply reduces volumes and mobility with little effect on prices. Our findings may help to reconcile past research:

- Changes in composition of transactions can look like price effects
- Results are consistent with model in Cho, Li and Uren (2024)

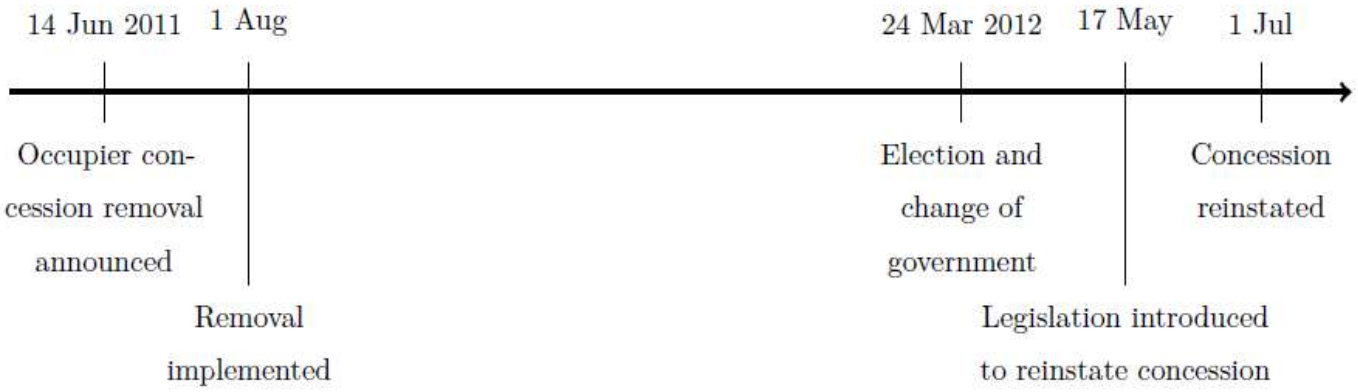
A natural experiment in Queensland

Stamp duty changed suddenly in Queensland in FY 2012

14 June 2011: QLD government announced removal of large concession for **owner-occupier purchases**

1 August 2011: Removal implemented

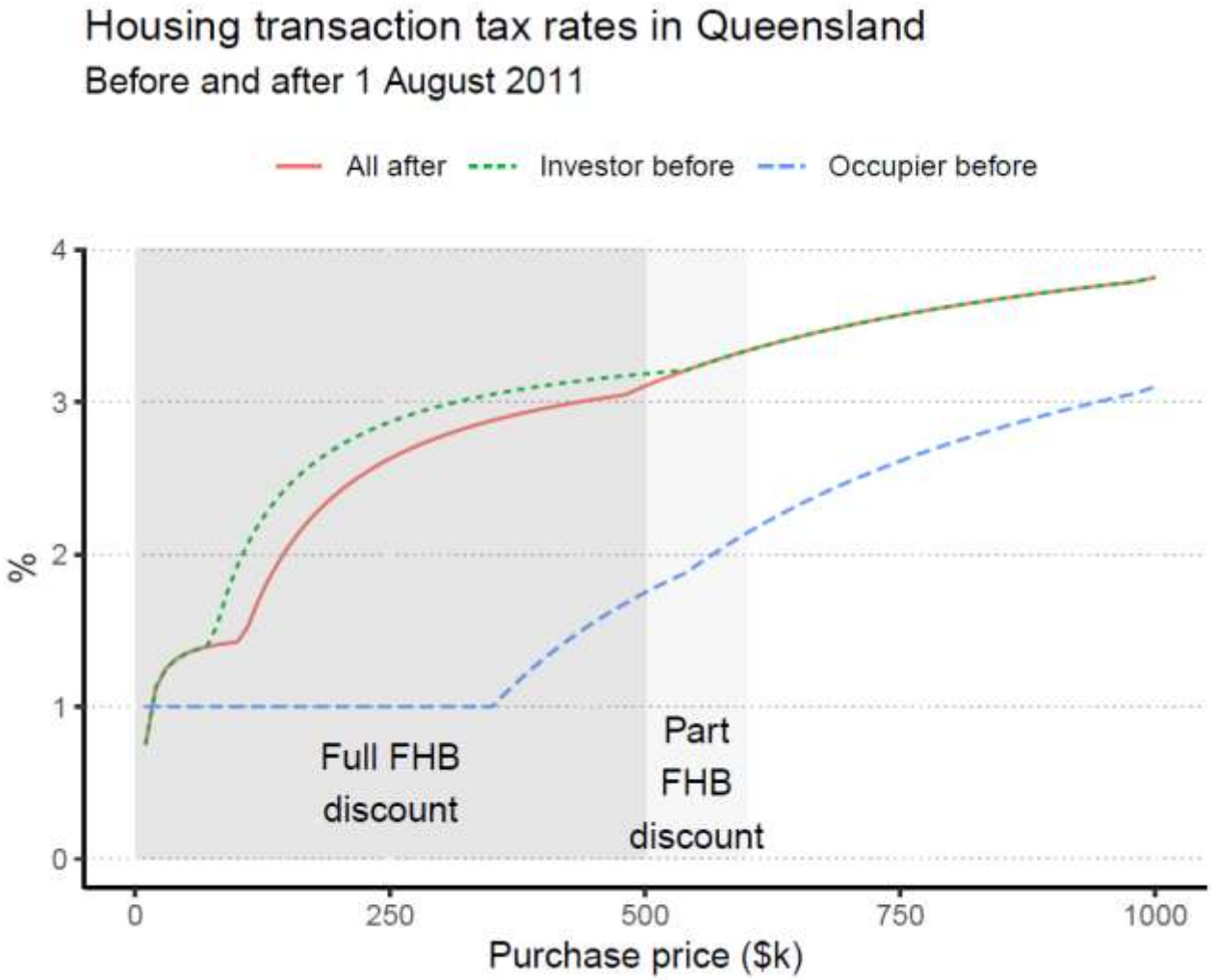
1 July 2012: Concession reinstated after change of government



Stamp duty rates before and after

Who was affected?

- **Non-FHB occupiers (50% of buyers) saw their tax rise by 1% of sale price** on average.
- **First-home buyers (FHB)** remained exempt from stamp duty
- Little change in stamp duty for **investors**
- Other states did not change stamp duty



Notes: First−home buyer (FHB) discounts meant that the FHB tax for purchases under $500k remained zero before and after the tax change.

Data

The data

Home sales

Main data source on property transactions and prices (Proptrack):

We observe **purchases** for **different types of properties**: owner-occupier vs investor

Note: We don't observe the characteristics of the property owner: we assume a property is owned an investor if rented within 6 years of purchase

Home moves

Two complementary data sources on housing mobility:

1) Address records (PLIDA) capture **changes of address for individuals**
2) Household survey data (HILDA) capture **people reporting when and where they moved** (and whether they expected to move)

Also observe whether they changed jobs too

Identification

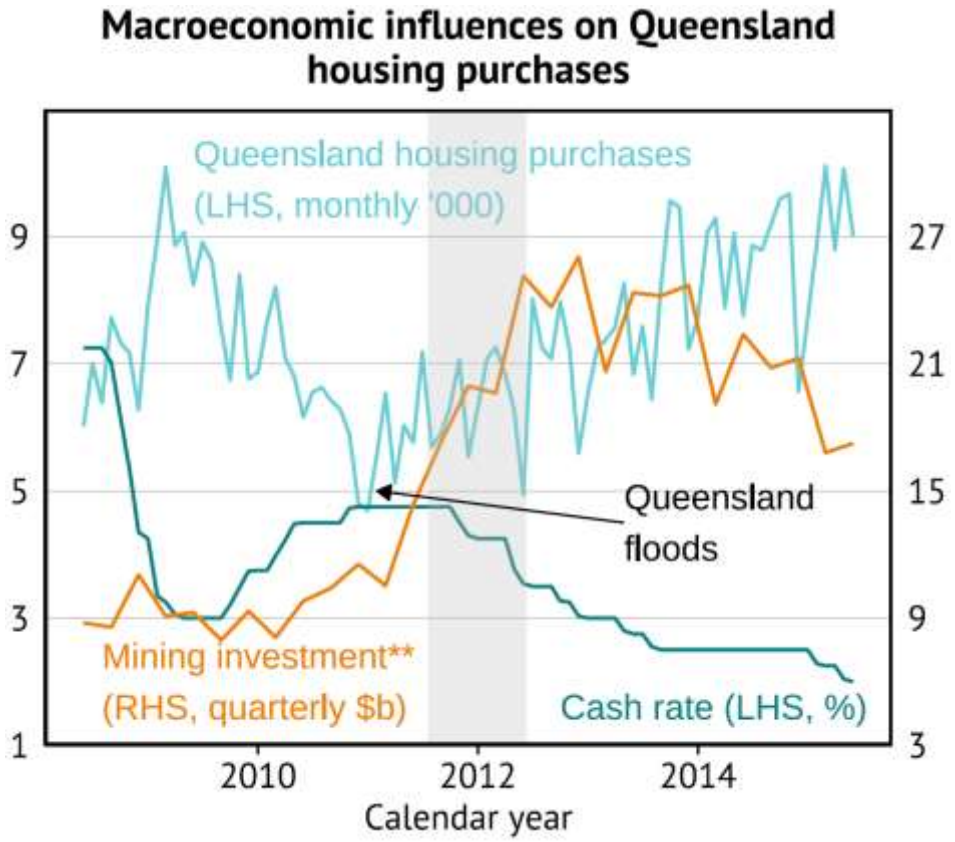
How do we identify the causal effect of the change in stamp duty on home buying decisions?

Identification challenge: pre-post comparisons could be misleading – other macroeconomic events coincided with the tax change, such as:

- Changes in interest rates
- Commodities boom
- Floods

Our approach: compare QLD to similar areas in other states (DiD)

- Match each QLD region to a control region with similar pre-2011 trends (controls for macroeconomic effects)
- Look at changes in home purchases for owner-occupiers relative to investors within each region (controls for local area effects)



We use an event study framework

<u>Home purchases</u>: Were QLD owner-occupiers less likely to buy compared to owner-occupiers in the rest of Australia (and relative to all investors) after the policy change?

- Important: Unit of observation is the *difference* between owner-occupier and investor purchases **<u>within</u> each SA3** – becomes like a triple difference estimator

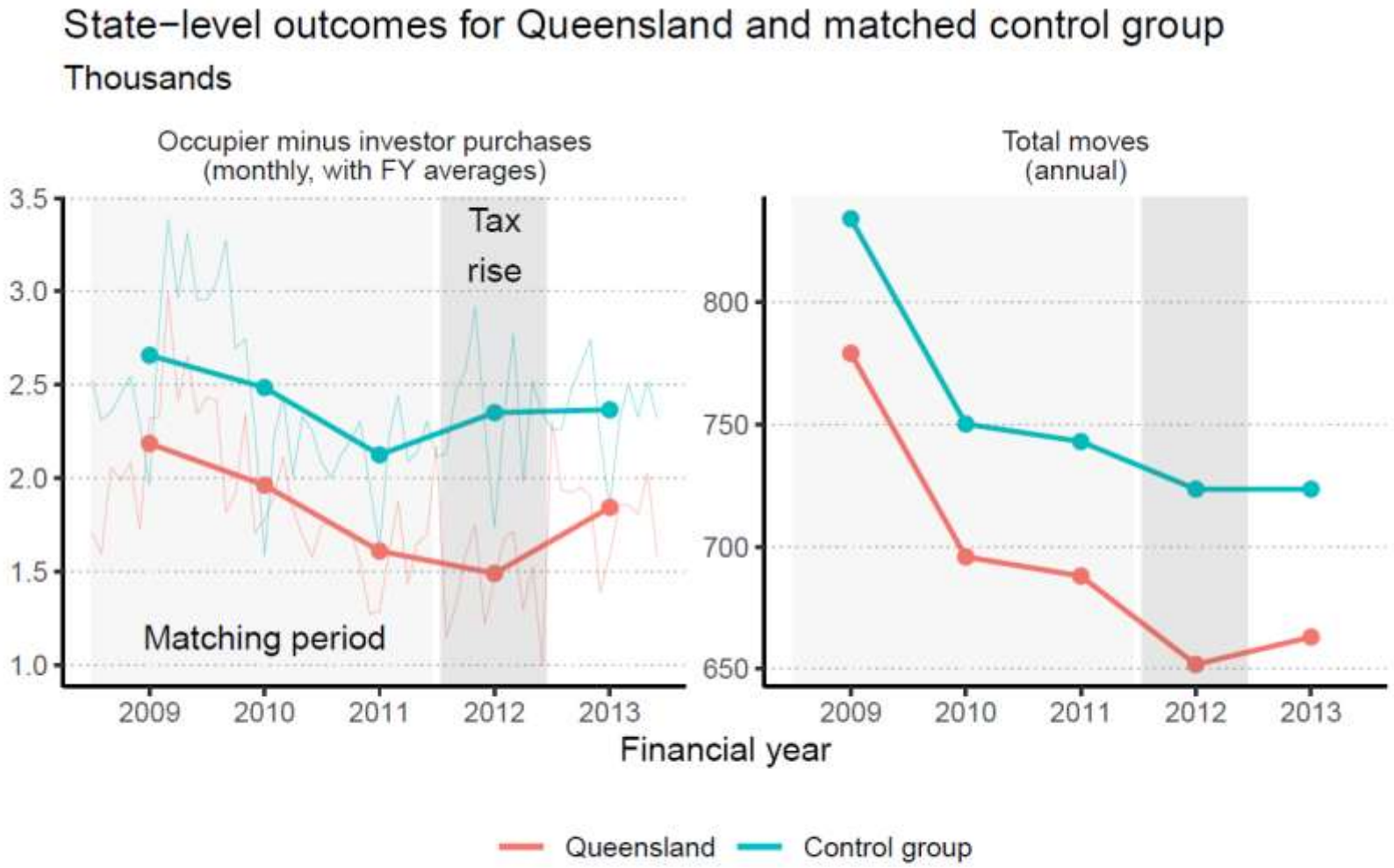
- 164 cross-section units (SA3s): 82 in Queensland, 82 in control (based on pre-trend matching)
- 4 time periods: FYs 2009-2011 (pre-treatment) and FY2012 (treatment)
- Model includes SA3 and time fixed effects
- <u>Note:</u> we exclude purchases <$350k to omit most first-home buyers

<u>Home moves</u>: Were households less likely to move in QLD relative to other states after the policy change?

- We can't (yet) directly identify owner-occupiers in the address records
- This motivates the use of complementary household survey data where we can identify owner-occupiers and renters despite a smaller sample

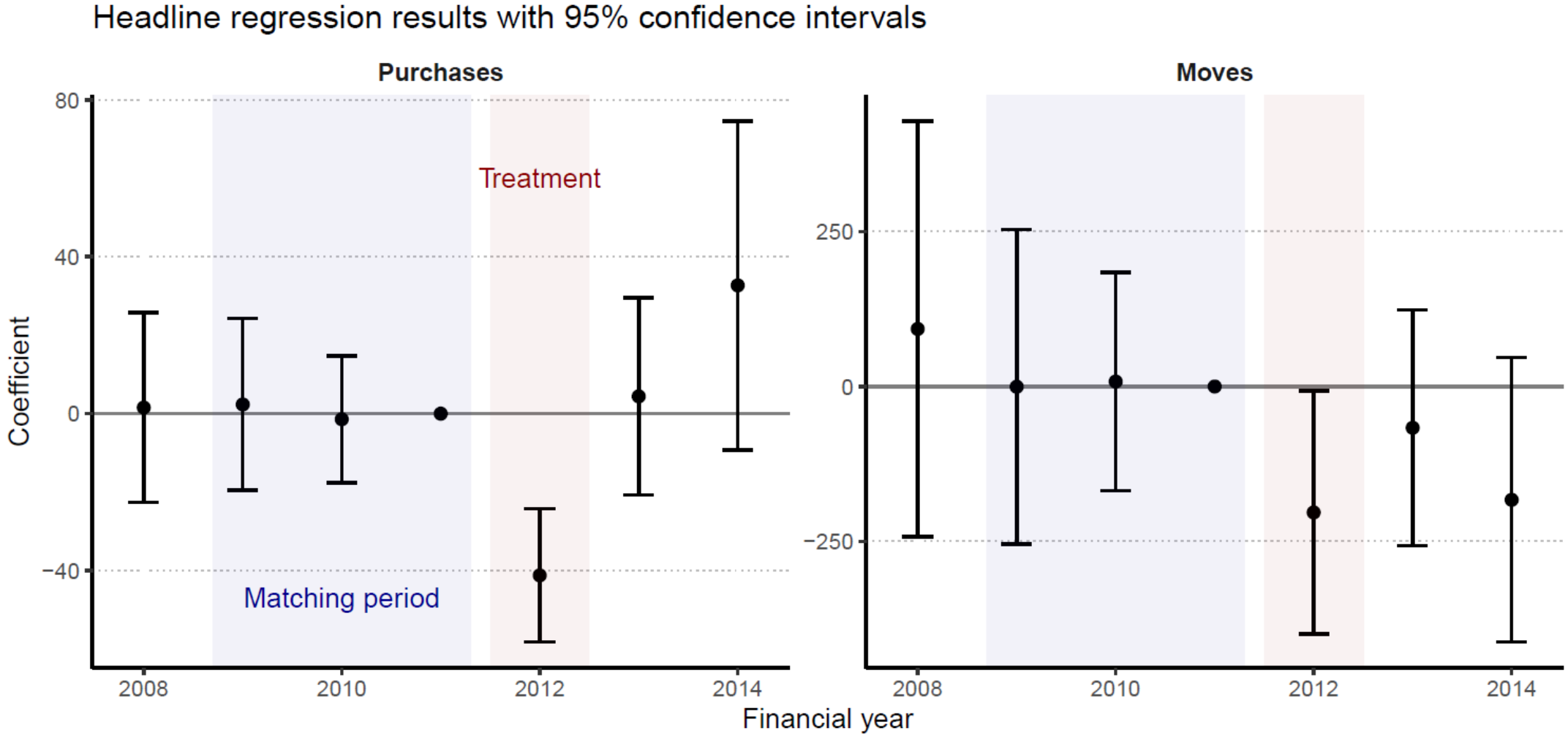
Key results

QLD owner-occupiers were less likely to buy (and to move) in FY12 compared to the rest of Australia

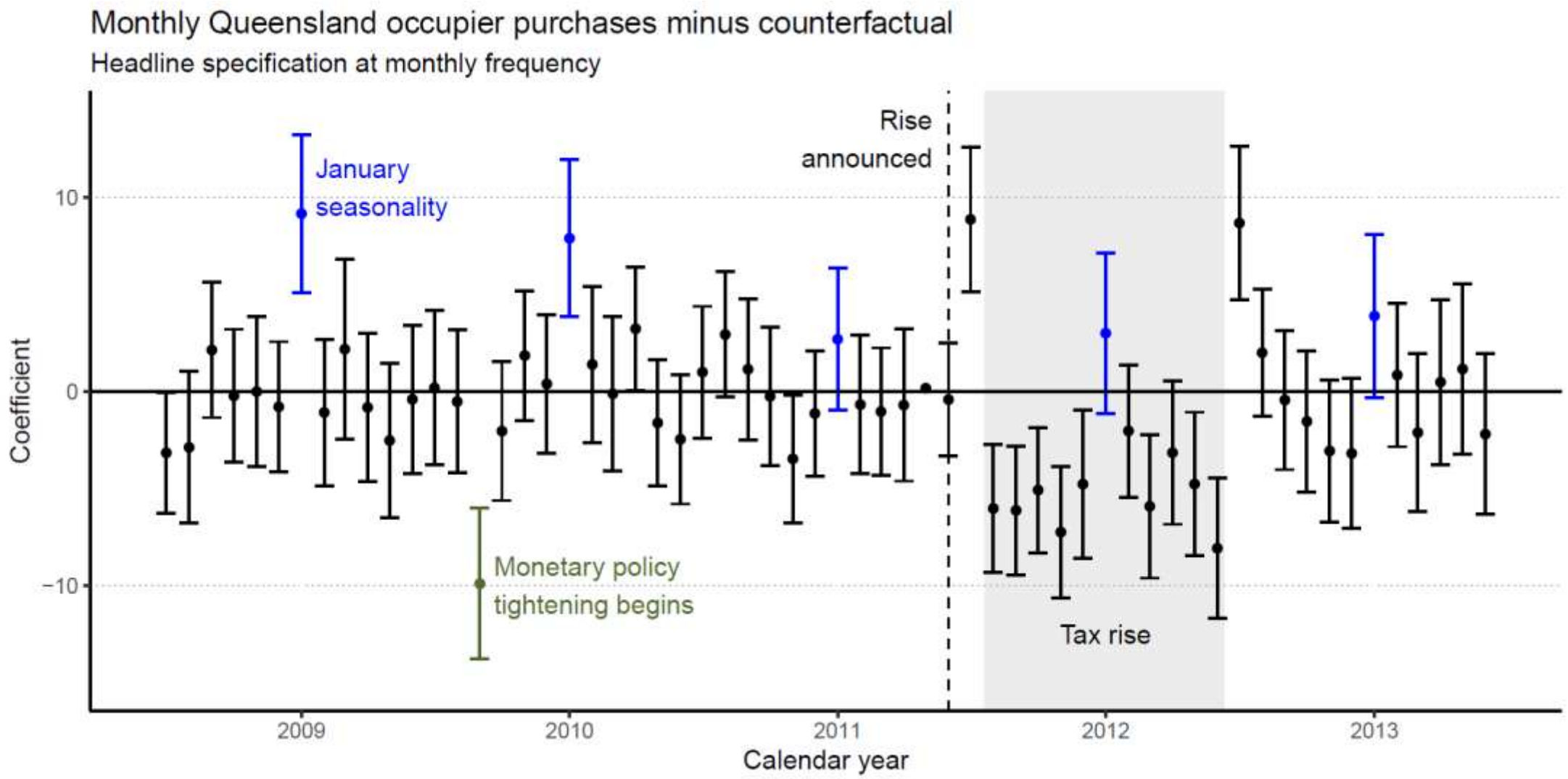


Notes: July 2011 is included in the FY 2012 points but excluded from the tax−rise shading, because the tax rise occured on 1 August 2011. Trend differences between purchases and moves can reflect moves by renters.

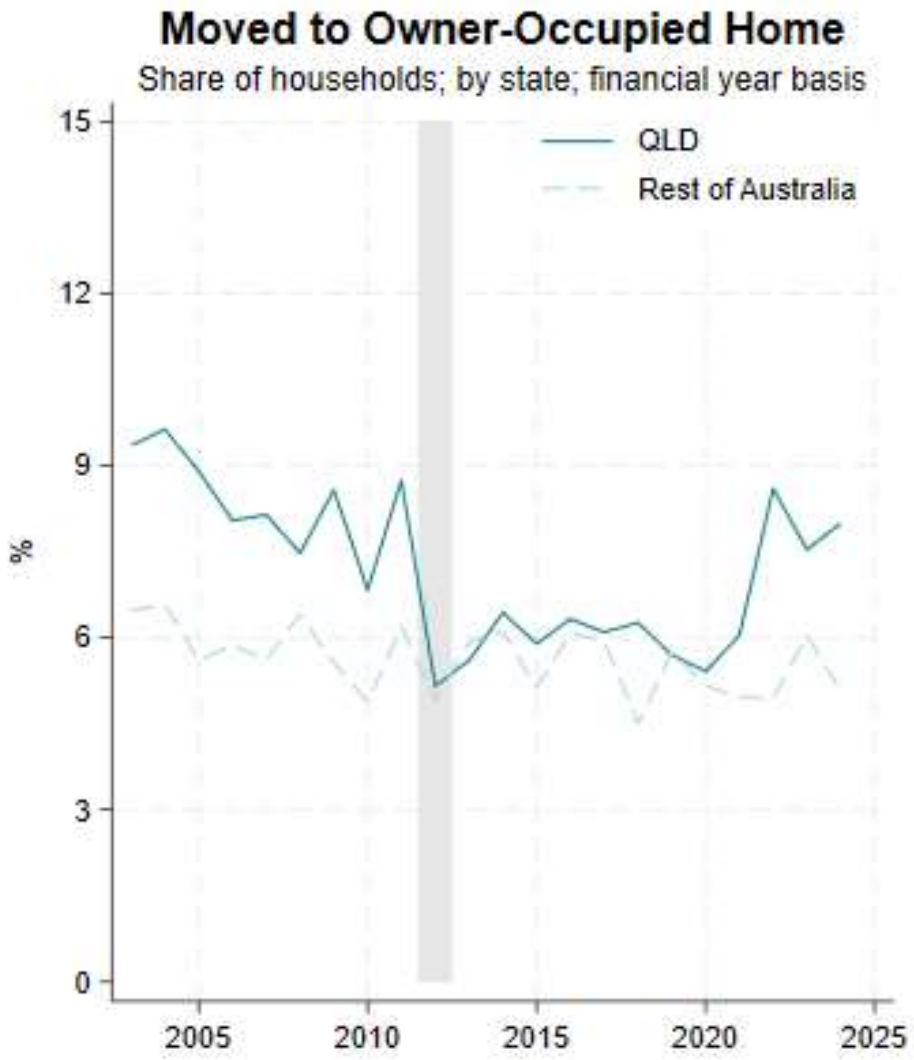
Event study regressions show a clear drop in property purchases and home moves in QLD in FY11/12

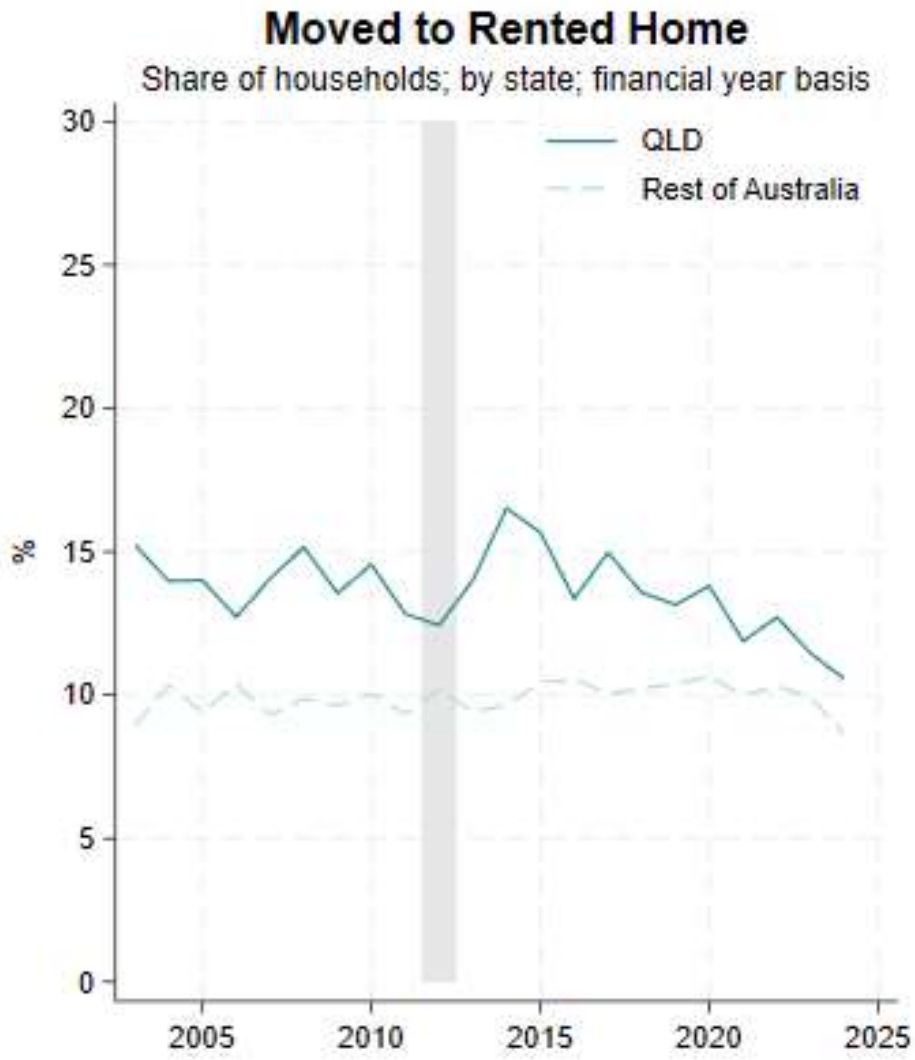


How much of the effect was temporary, due to anticipation of reversal?

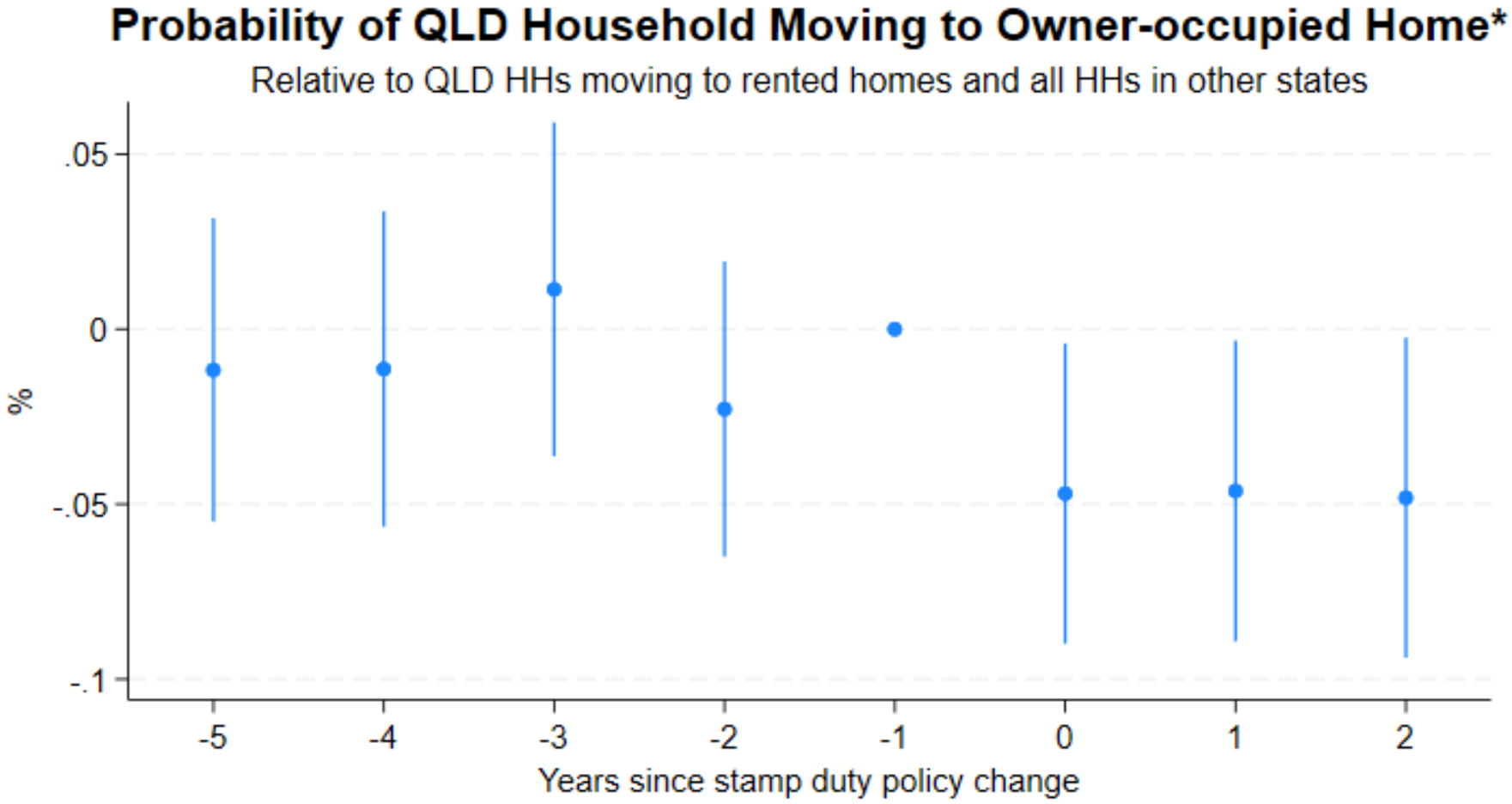


Results upheld in survey: Big drop in the rate of QLD owner-occupier moves compared to renter moves (and relative to rest of AUS)

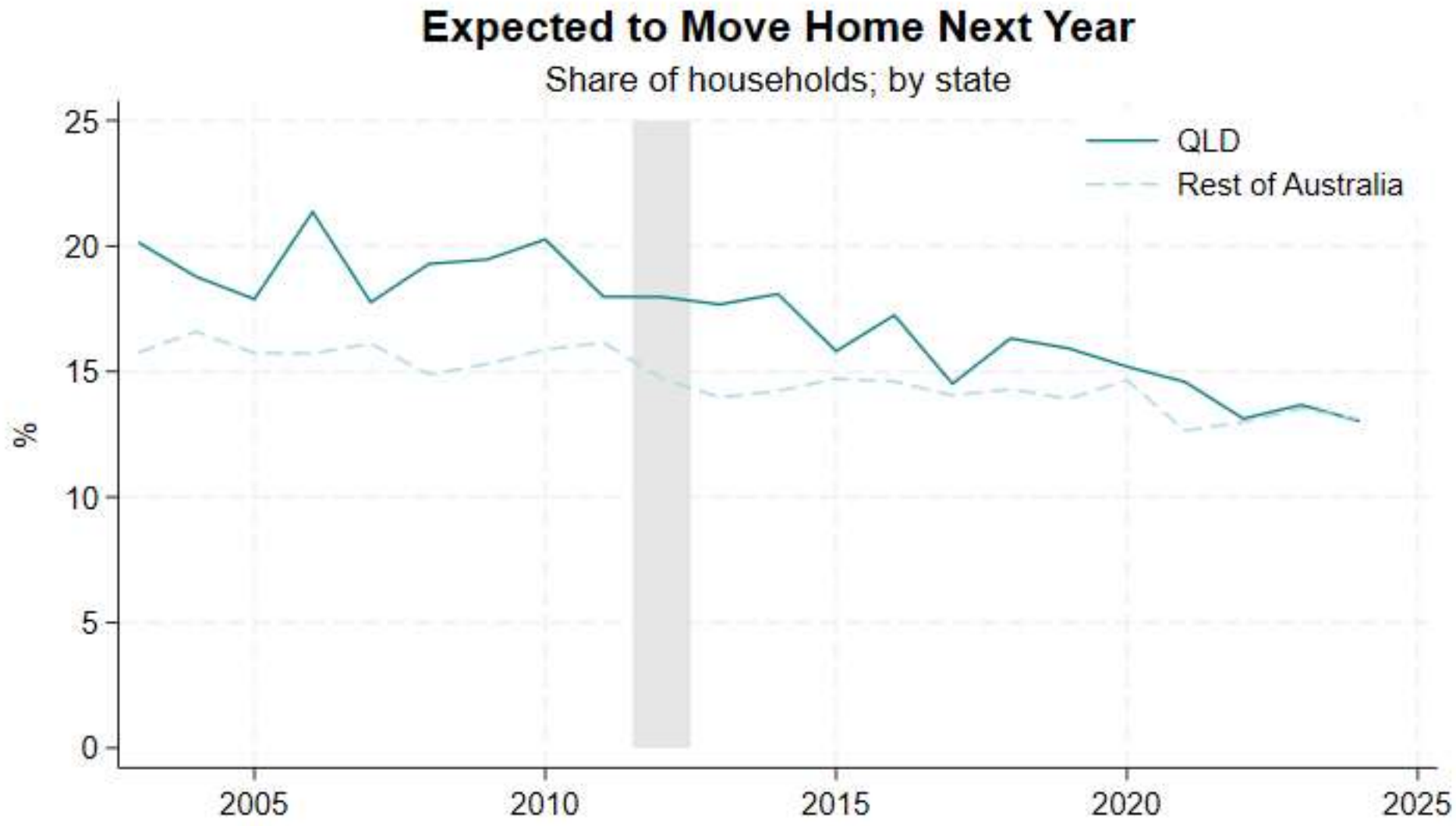




Results upheld in household surveys: And see a big drop in QLD owner-occupier moves in a triple difference regression too



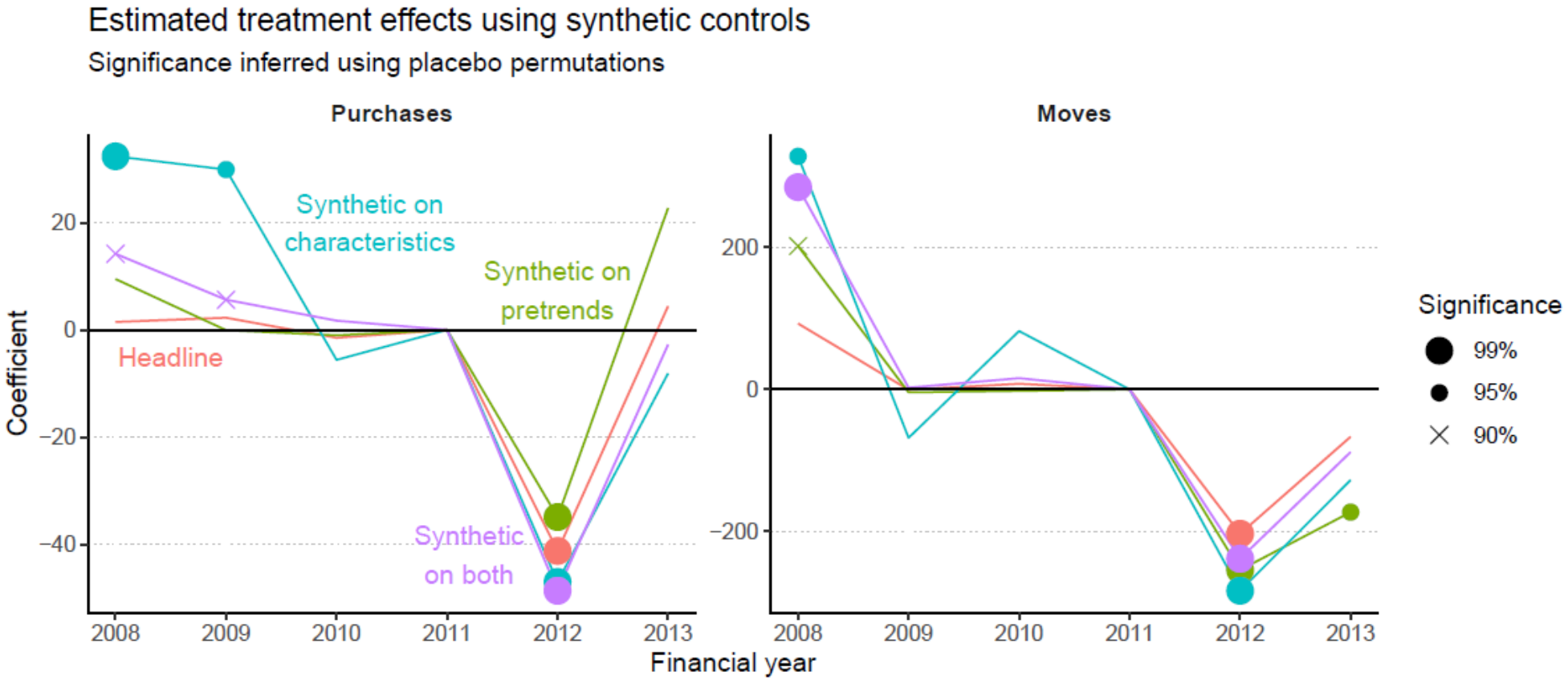
Not obvious that QLD households anticipated the policy change and expected to move less



We tried a bunch of other things…

- Micro-level synthetic controls (Abadie and L'Hour, 2021)
- Sensitivity testing of control-group selection
- Time-shifted placebo tests
- Alternative standard errors from placebo permutations (Abadie, Diamond and Hainmueller, 2010)
- Credible parallel trends (Rambachan and Roth, 2023)

…and found pretty much the same things…



Notes. Headline uses one−to−one matching on pretrends with p−values using the Abadie et al. (2010) placebo permutations. The other estimatations use the penalised synthetic control method of Abadie and L'Hour (2021). Synthetic on pretrends is matched only on the three pre−treatment outcomes, demeaned. Synthetic on characteristics is matched on six area characteristics measured in FY 2011. Synthetic on both is matched on pretrends and 2011 characteristics.

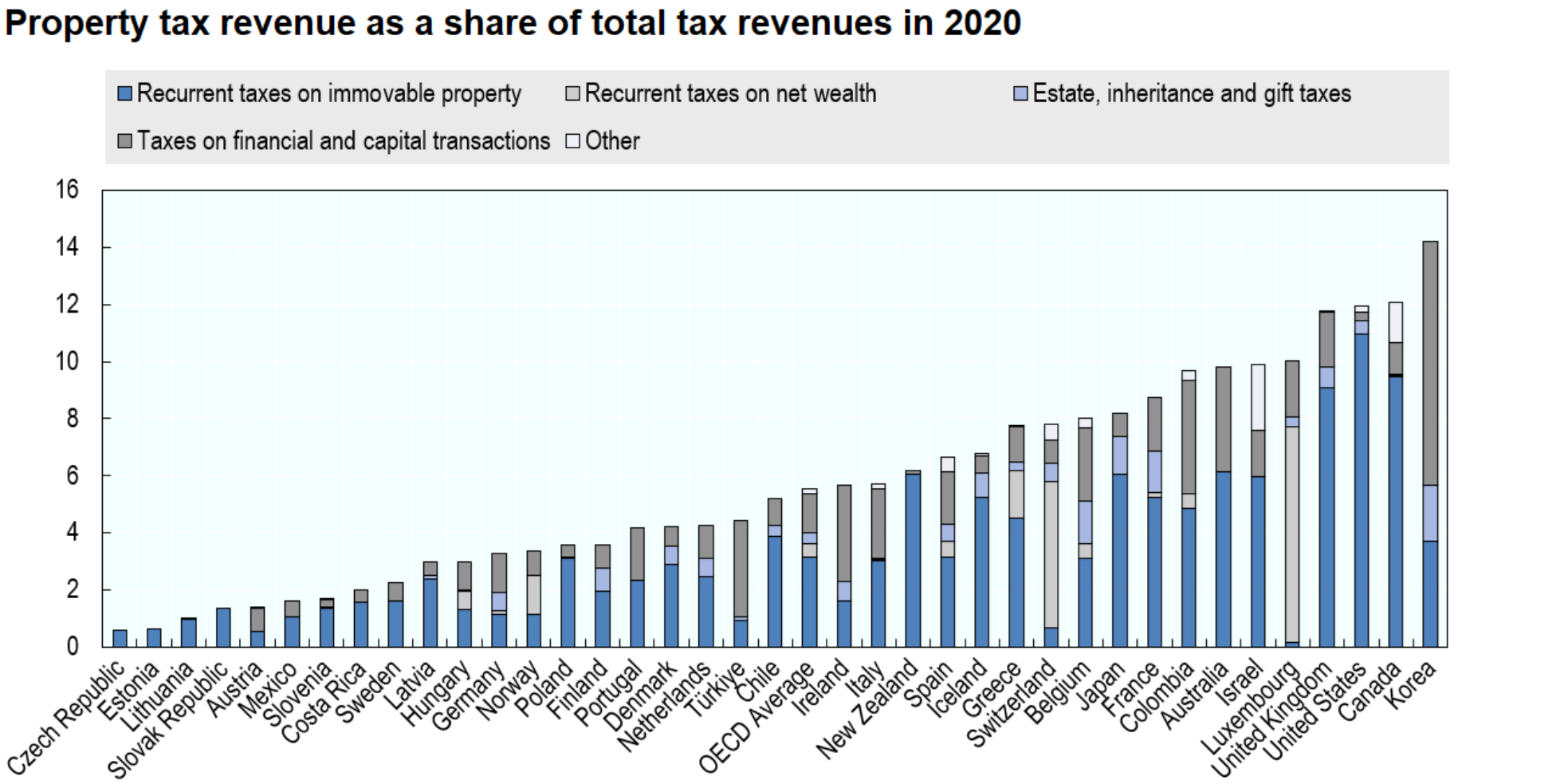
Conclusions

What do we learn?

- **Higher stamp duty significantly lowers home purchases and moves** (but little effect on prices – not shown today!)
    - Treatment effects from a ~1ppt stamp duty rise (% of FY 2011 levels):
        - **Purchases: -13%**
        - **Moves: -10%**
    - **Mostly permanent**: about -11% effect on purchases (similar to past estimates)
    - Small temporary effect, in line with previous work suggesting limited buyer sophistication (e.g. Gomes et al (2021); Bhutta et al (2020))
- Heterogeneity analysis shows that:
    - **Most purchases affected** (including home type, urban/rural and age of buyer)
    - **Both short and long-distance moves affected**
    - **Moves by job switchers and high-income people are not affected**
        - Consistent with little effect on moves with higher value than the stamp duty cost

Q&A

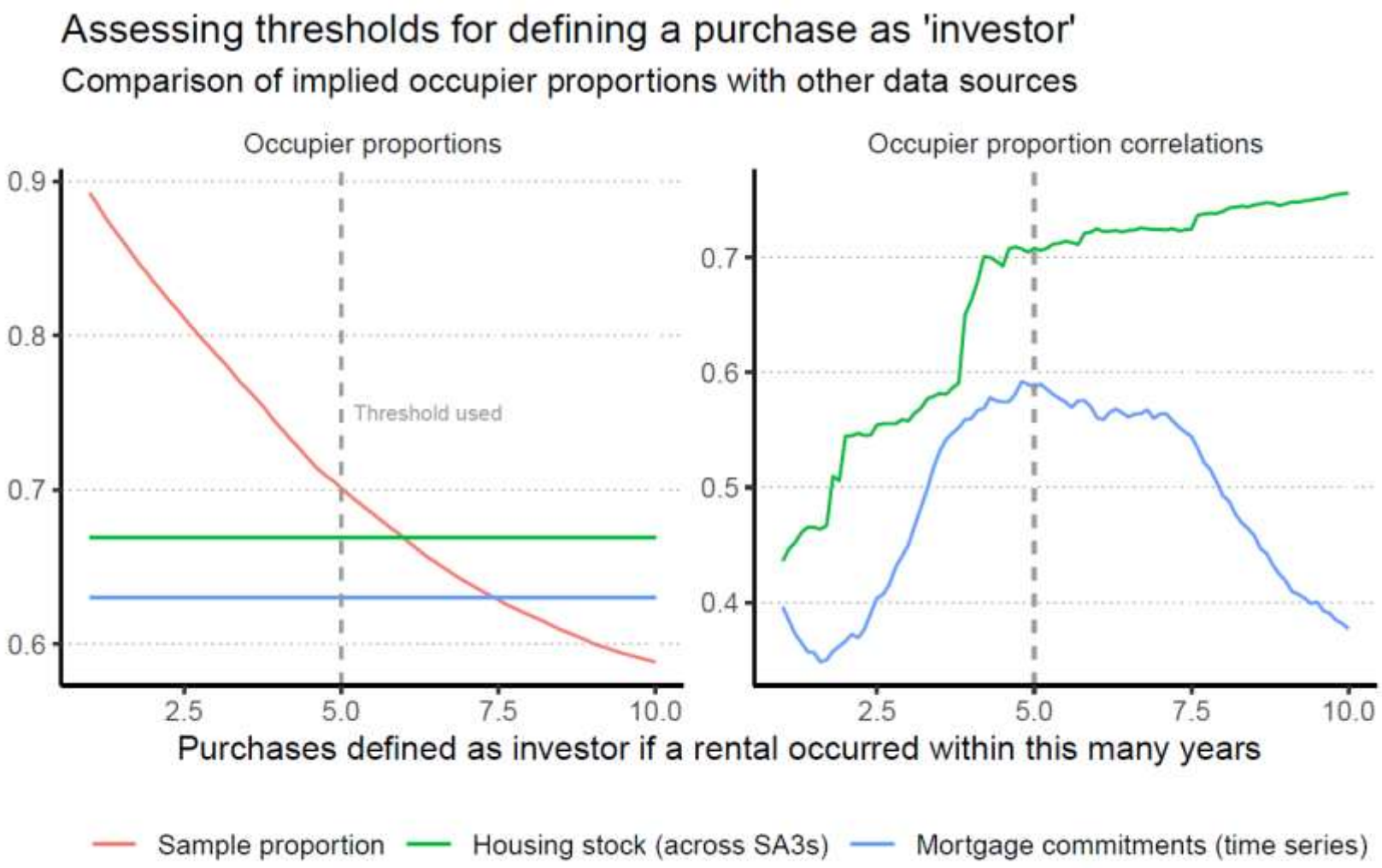
Stamp duty across OECD countries



Note: 2019 data for Australia, Greece, Japan, New Zealand and the OECD average. Data include taxes paid by households and non-households and include household and non-household real estate.

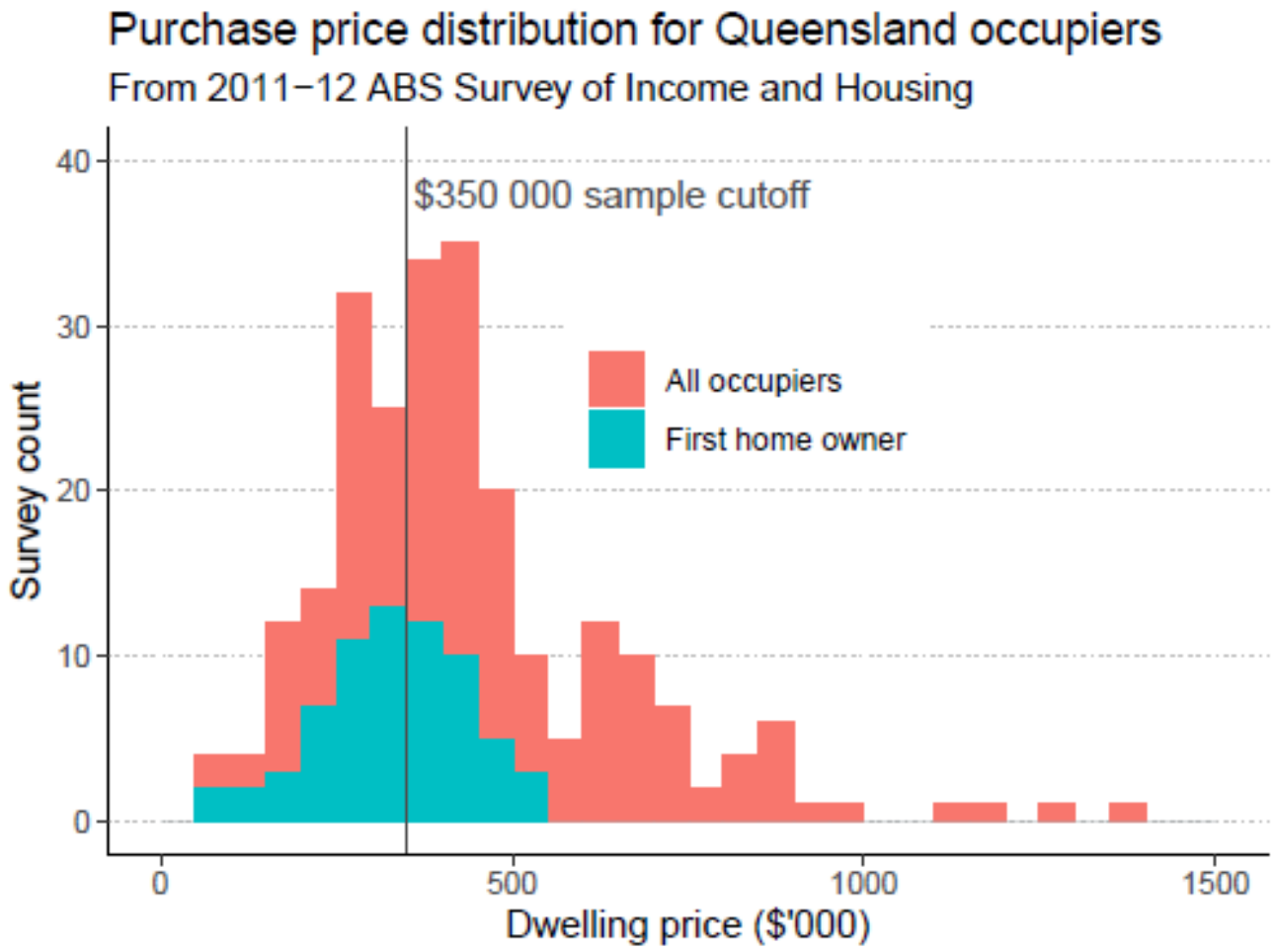
Source: OECD Revenue Statistics

Investor purchase definitions

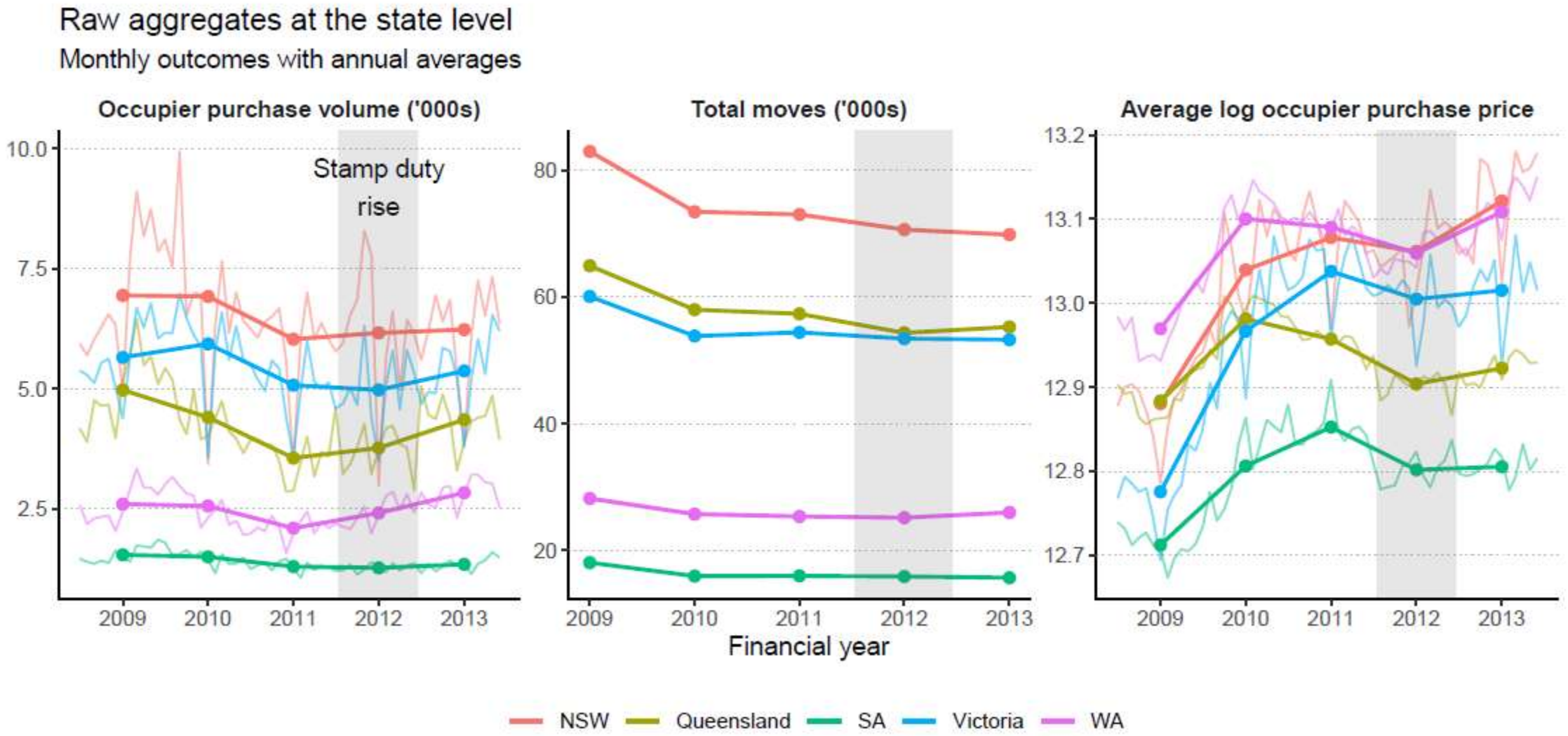


Notes: Queensland only. Housing stock data from 2011 census. Morgage commitments data sample is FY 2008−13. Mortgage commitments proportion is from FY 2011. Mortgage commitments data report values of commitments, everything is else counts

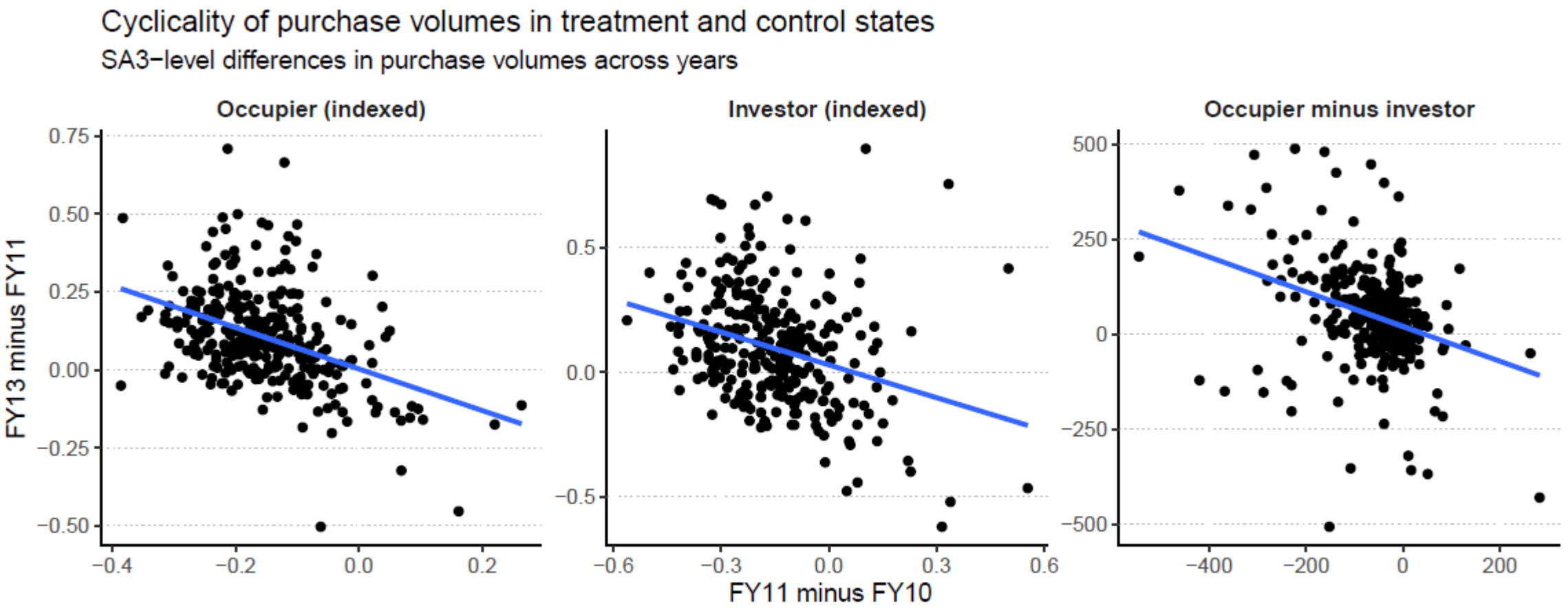
First-home buyer distribution



Raw aggregates and unmatched trend difficulties

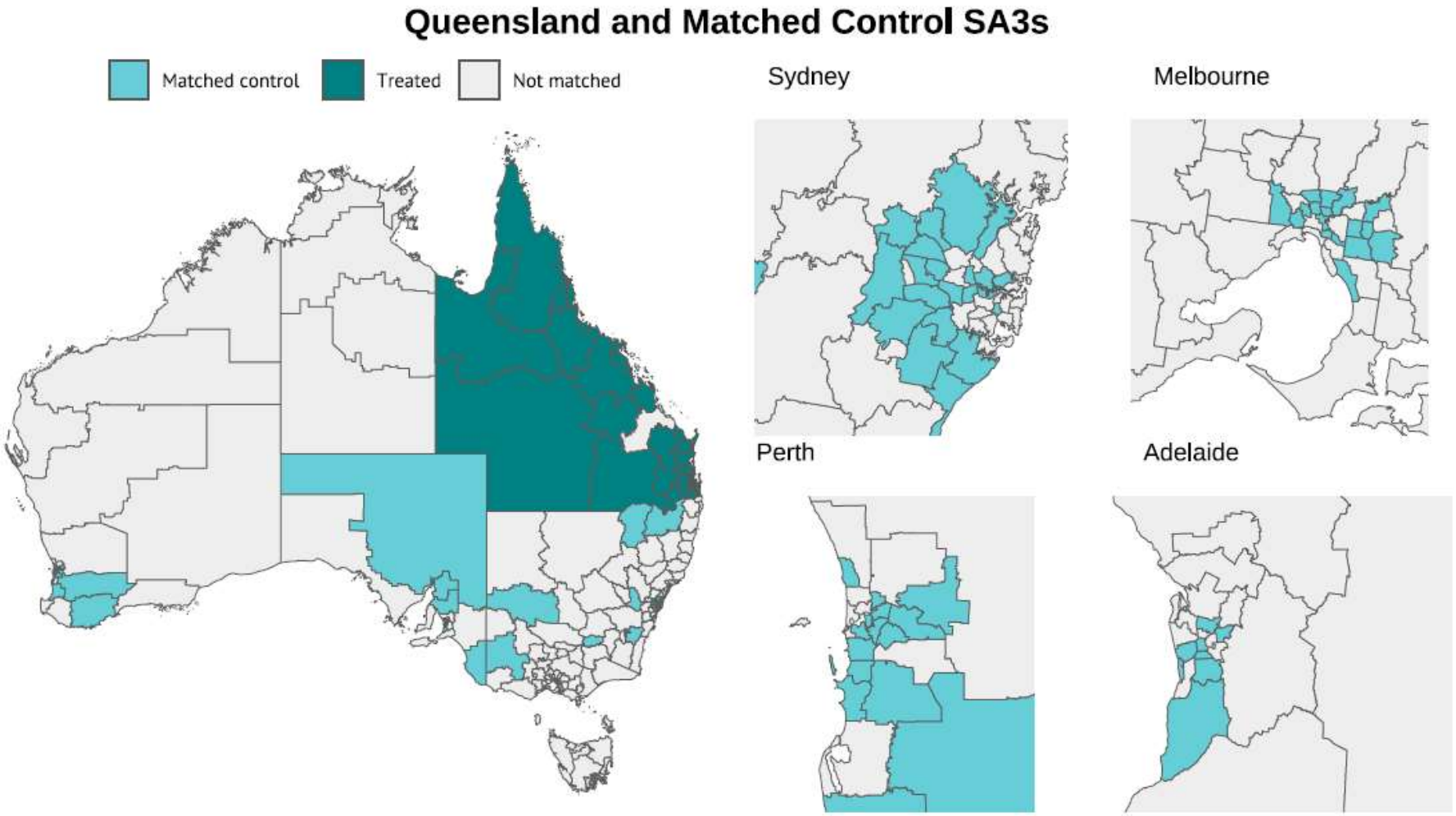


Sensitivity of volume to monetary policy cycle

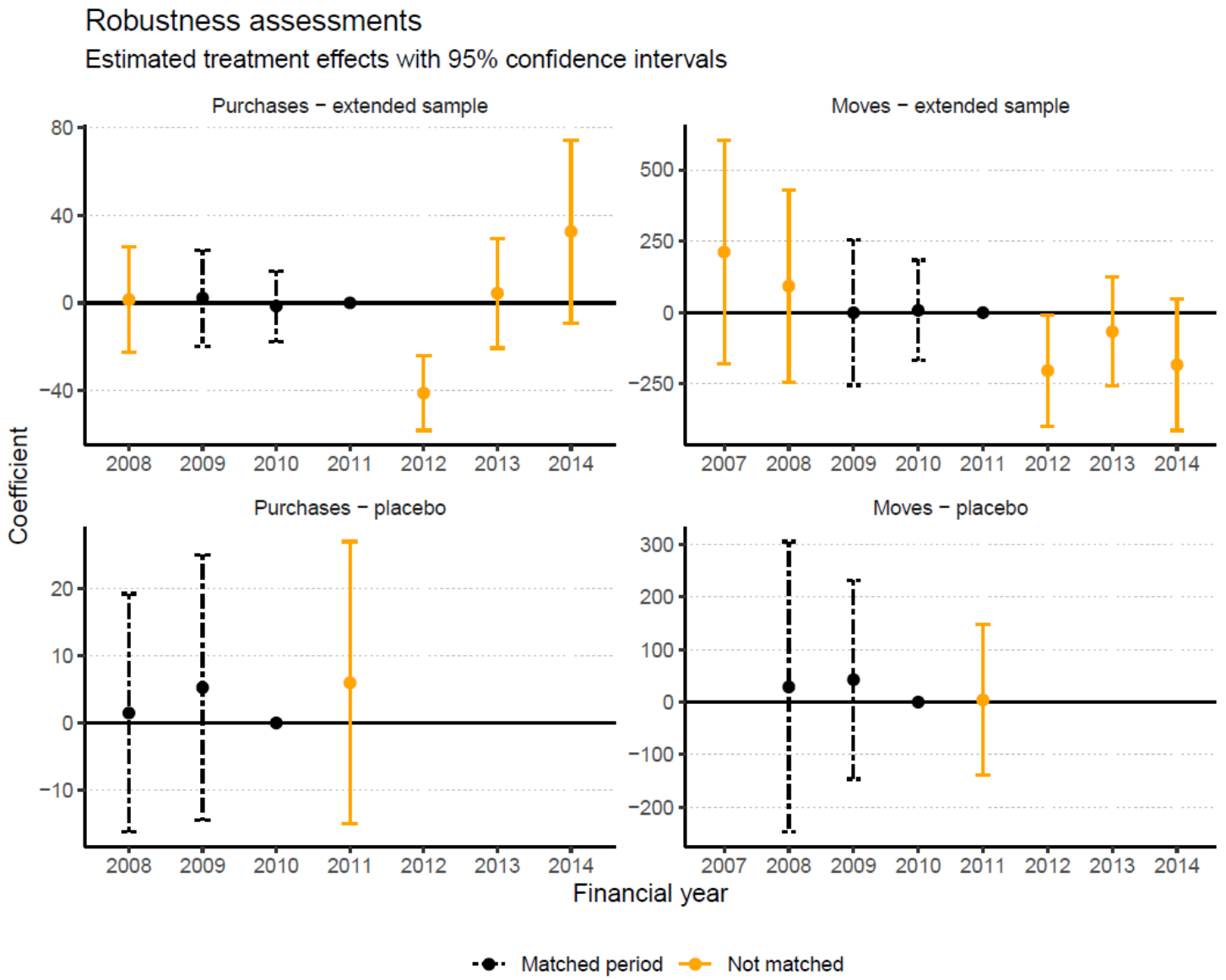


Notes: Indexed values are indexed to FY 2010 level before differencing. Covers all SA3s in treatment and control states. Fitted lines use OLS.
One outlier removed from investor panel.

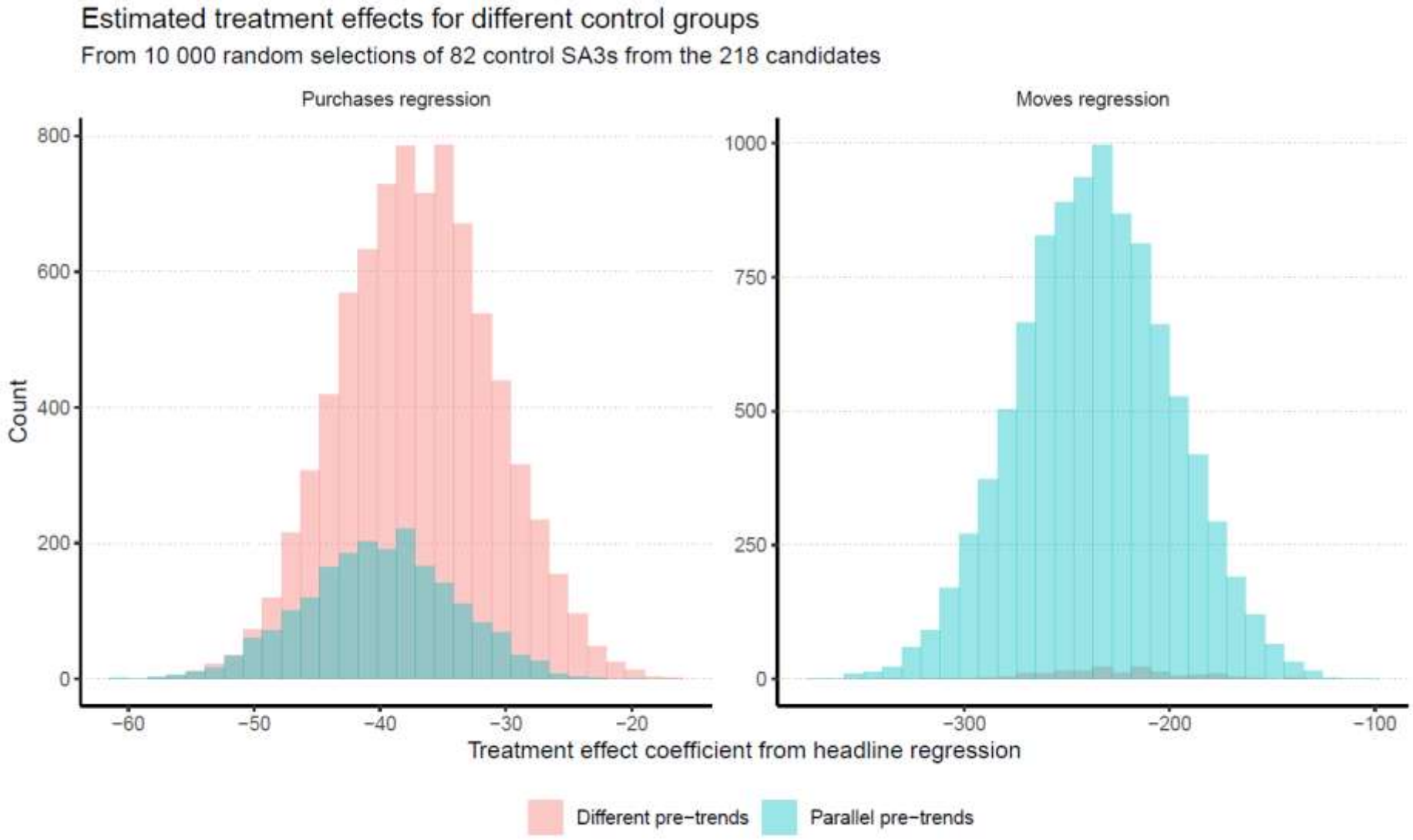
Matched SA3s



Robustness – parallel trends

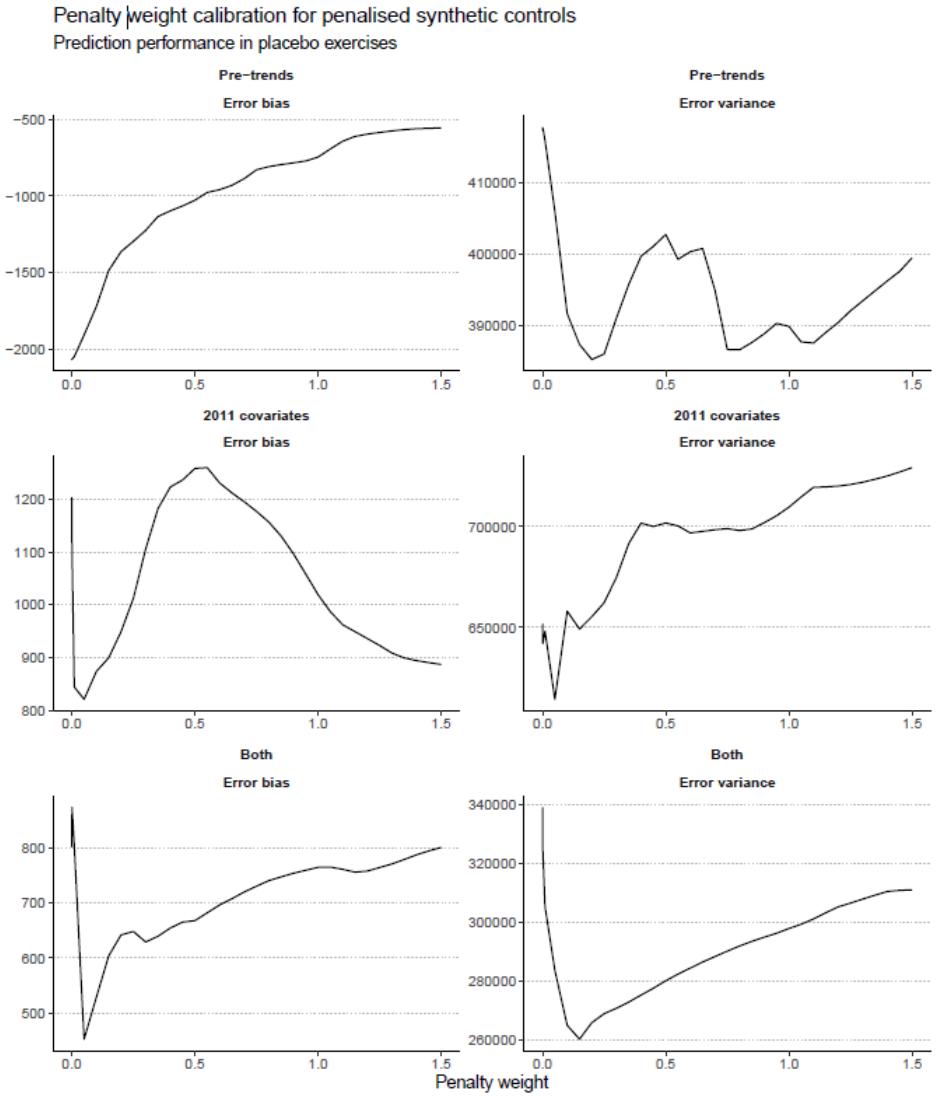


Robustness – sensitivity to matches



In the purchases regressions, all but 1 are negative and significant at 95%. In the moves regressions, 83.3% are negative and significant at 95%.
Pre−trends are labelled parallel if neither of the FY 2009−10 coefficients is significant at 95%.

Robustness – synthetic controls penalty calibration



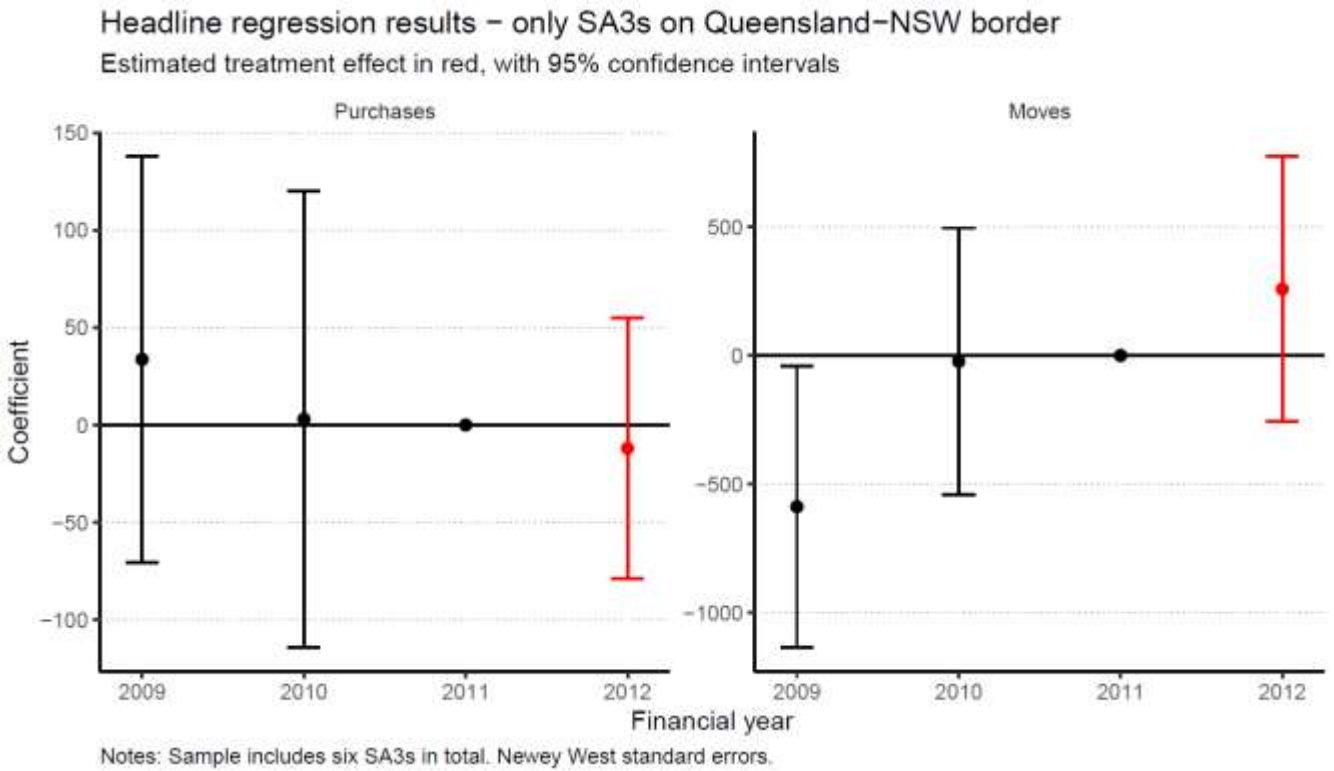
Permanent versus temporary breakdown

- July-August 2012 pickup is 16% of FY 2012 estimated treatment effect
  - 84% of estimate represents permanent effect (11 ppts of 13% purchase decline)

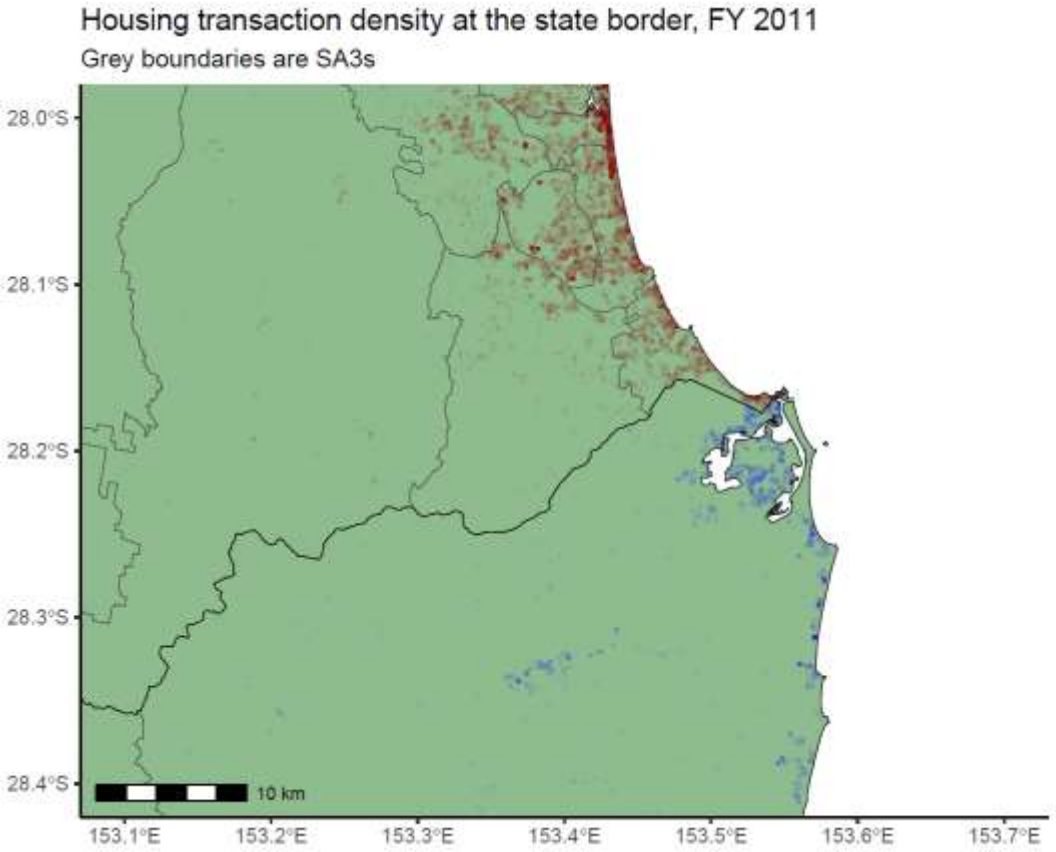
- Best and Kleven (2018) find 70% of their effect is permanent, even though common knowledge of temporary change
  - Besley, Meads and Surico (2014) study same event and conclude 100% temporary
  - Our results more in line with Best and Kleven (2018)

- Temporary component seems small. But:
  - Housing buyers are relatively unsophisticated
    - wrt minimising mortgage costs (Buttha, Fuster and Hizmo, 2020; etc, etc)
    - wrt minimising tax costs (Slemrod, Weber and Shan, 2017)
  - Contact points for Qld buyers are incentivised to push quick purchases (brokers, REAs)
  - The monthly patterns within FY 2012 are inconsistent with a large temporary component

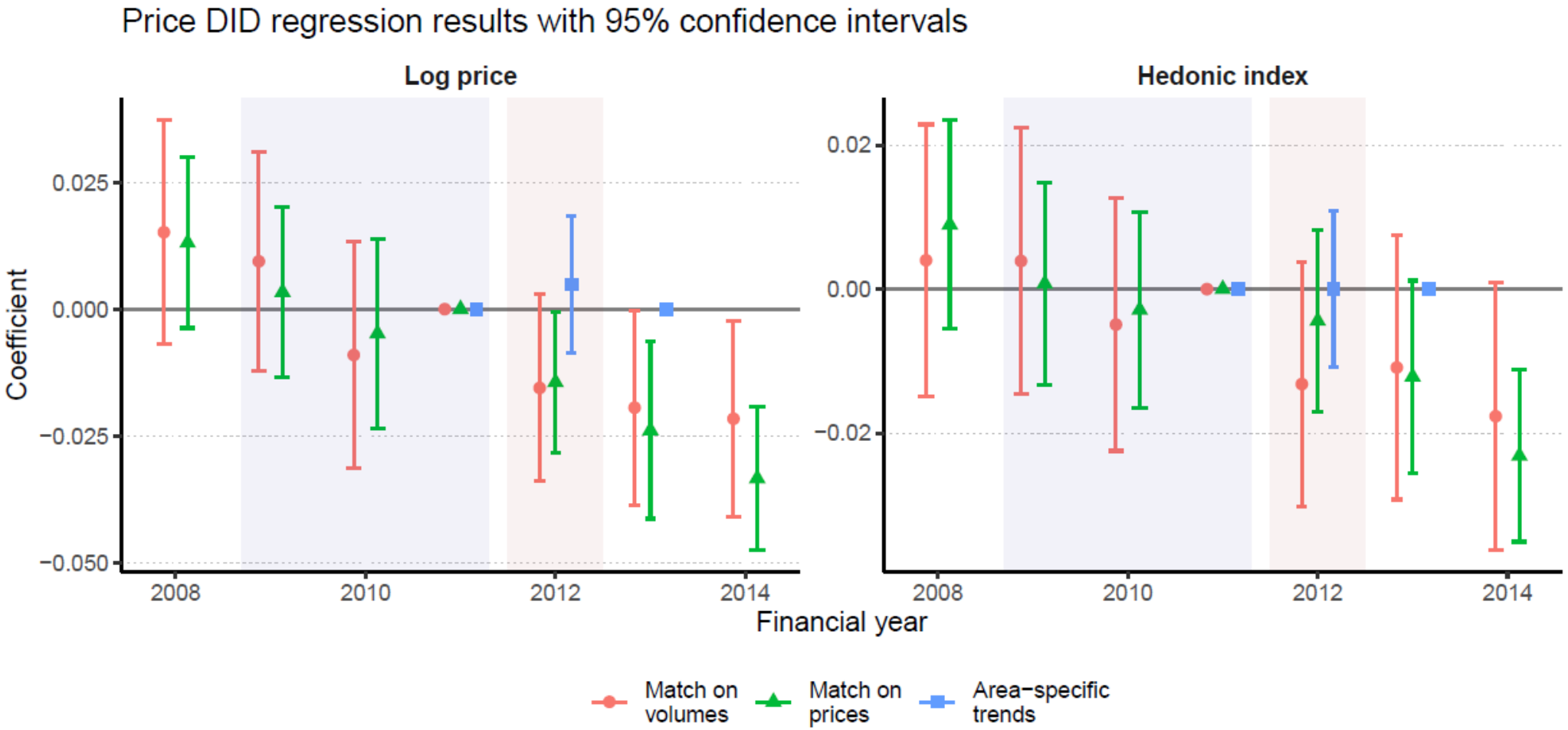
Analysis of NSW-Queensland border



Notes: Sample includes six SA3s in total. Newey West standard errors.



Diff-in-diff approach for prices



Price regressions

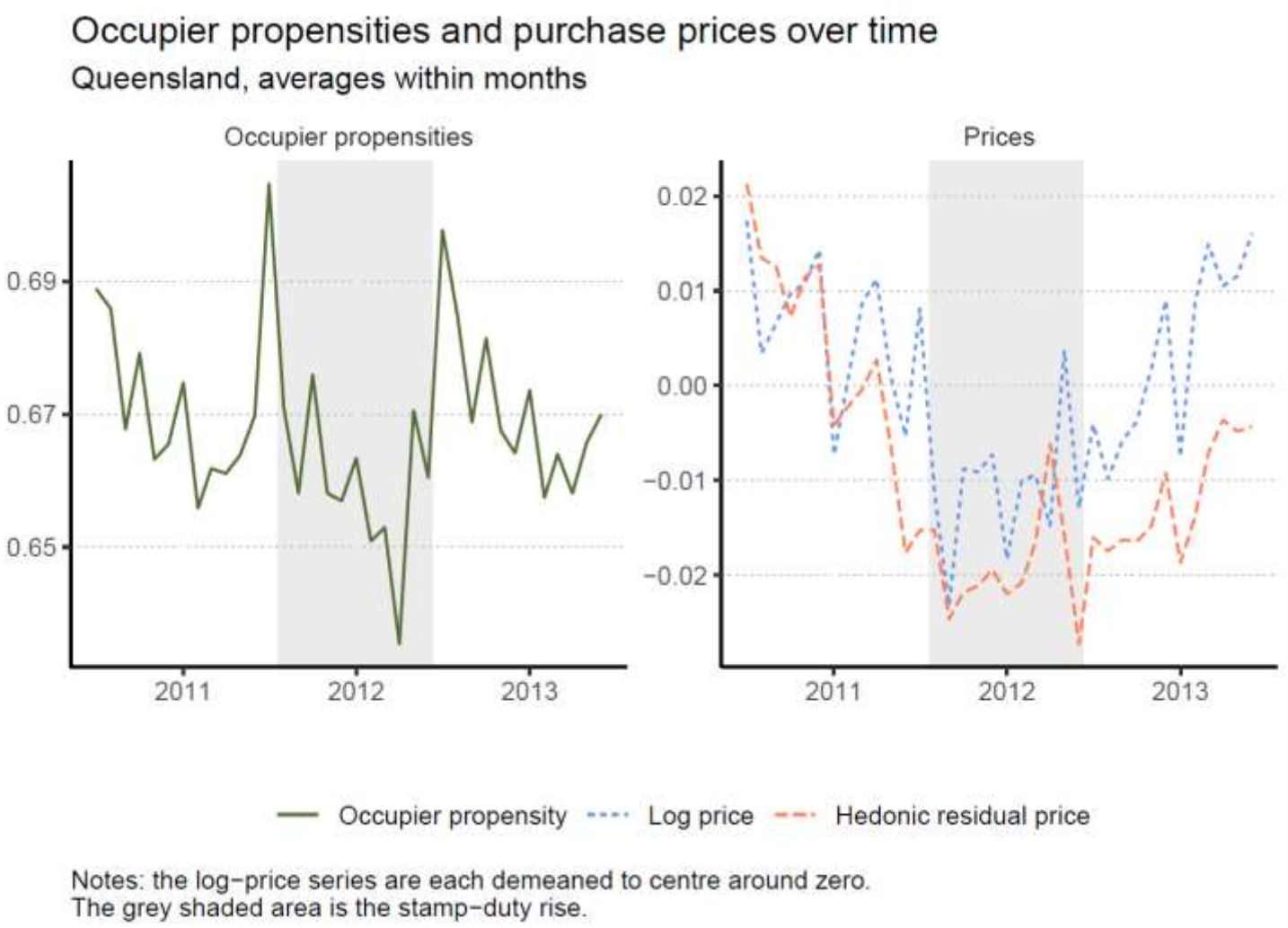
- Take purchase-level data (p) from all SA3s used in purchase volume regression.
- On FY 2010 data, estimate $\hat{\gamma}$ with LASSO LPM using time-invariant X_p:

$$\mathbb{I}(Occupier)_p = X_p\hat{\gamma} + \varepsilon_p$$

- Use $\hat{\gamma}$ to fit occupier propensities to all purchases in FYs 2011-12.
- On FY 2011-12 purchase data from same SA3s, estimate

$$\begin{aligned}\log(Price_p) = \alpha_{SA2} + \alpha_{FY} \\ + OccProp_p \times \Big(\beta_1 \times \mathbb{1}(p \in Queensland) \\ + \beta_2 \times \mathbb{1}(p \notin Queensland) \\ + \beta_3 \times \mathbb{1}(p \in 2012) \\ + \beta_4 \times \mathbb{1}(p \in 2012 \ \& \ p \in Queensland) \Big) + \epsilon_p,\end{aligned}$$

Occupier propensities – transaction composition



Estimated treatment effect on prices

Variable	Coefficient	SE	P-value
$OccProp_p \times$			
$\mathbb{1}(p \in Queensland)$	0.867	0.073	<0.001
$\mathbb{1}(p \notin Queensland)$	1.448	0.087	<0.001
$\mathbb{1}(p \in 2012)$	-0.072	0.022	0.002
$\mathbb{1}(p \in 2012 \ \& \ p \in Queensland)$	-0.006	-0.005	0.195

Prices

How to analyse price effects

- Similar triple difference approach (an average prices in an area) gives null results.
- But could have low power because
  - Prices are noisy
  - Average transacted prices are affected by changing composition of transactions
  - Effects could be present at other parts of the price distribution (aside from the area means)

- **Instead, ask**: For which housing would effects on prices be strongest?

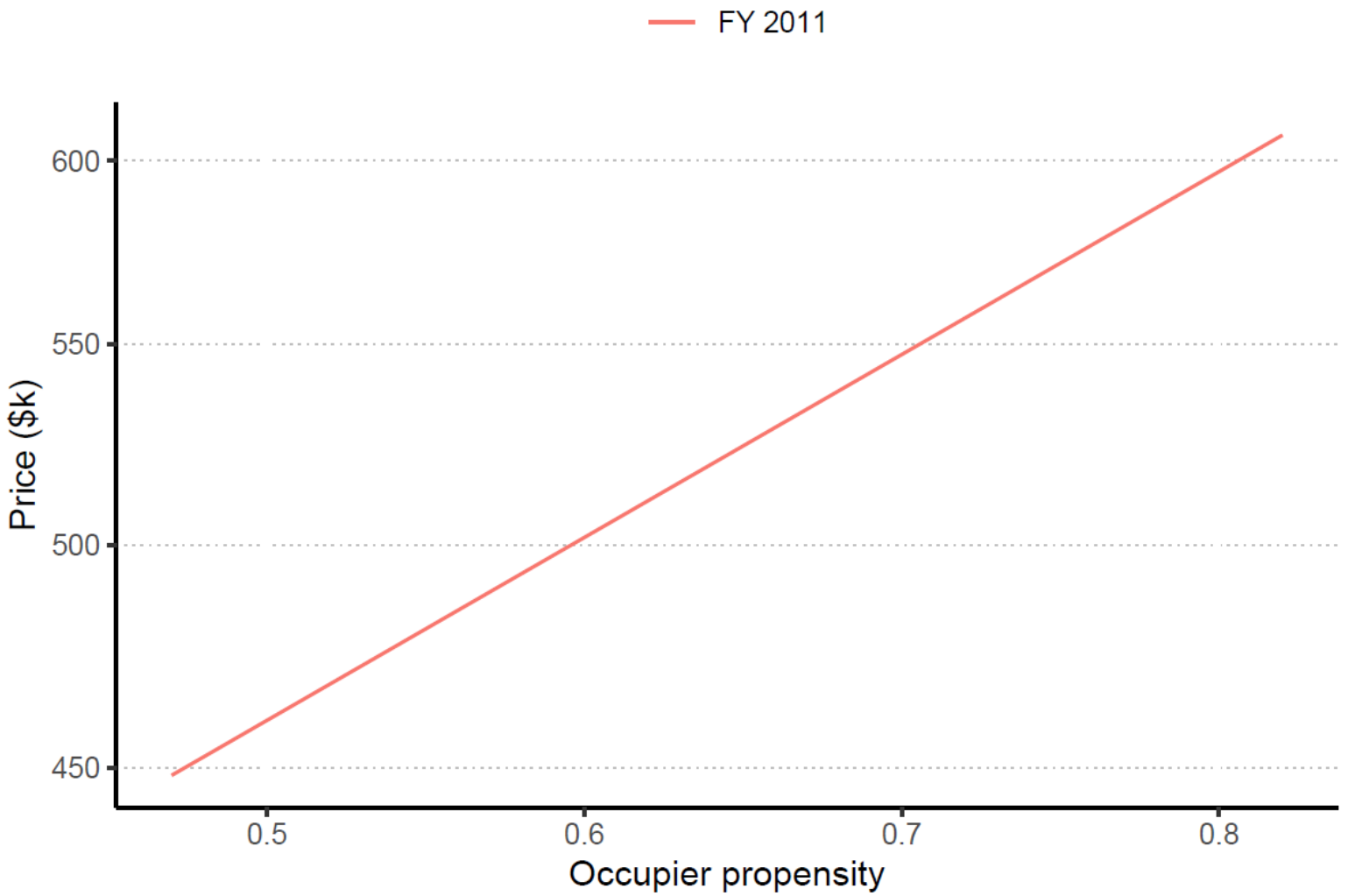
- **Answer**: In dwellings that investors (i.e. untreated) are least willing to buy.
  - i.e. less susceptible to arbitrage by non-treated

- **Approach** (similar to Prasad and Gillitzer, 2022):

  - Keep sample at transaction level (rather than aggregation within areas)
  - **Stage 1:** Give each home a time-invariant rating of likelihood an occupier (versus investor) buys it
    - 'Occupier propensity'
  - **Stage 2:** Assess how prices of high occupier-propensity dwellings changed relative to others
    - Specifically, look at changes in relationship between log price and occupier propensity

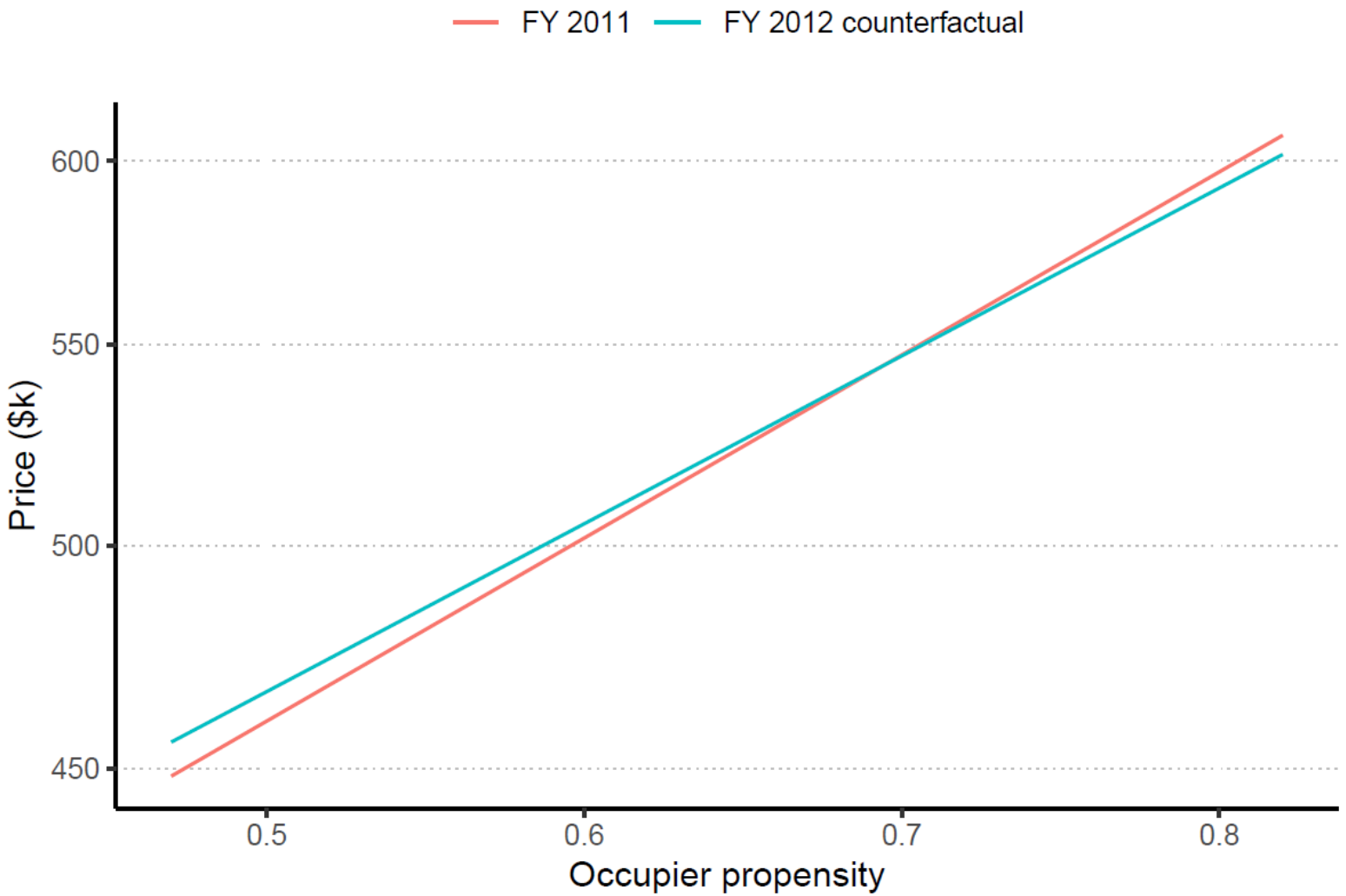
Estimated relationships between price and occupier propensity

Queensland, FY 2011−12



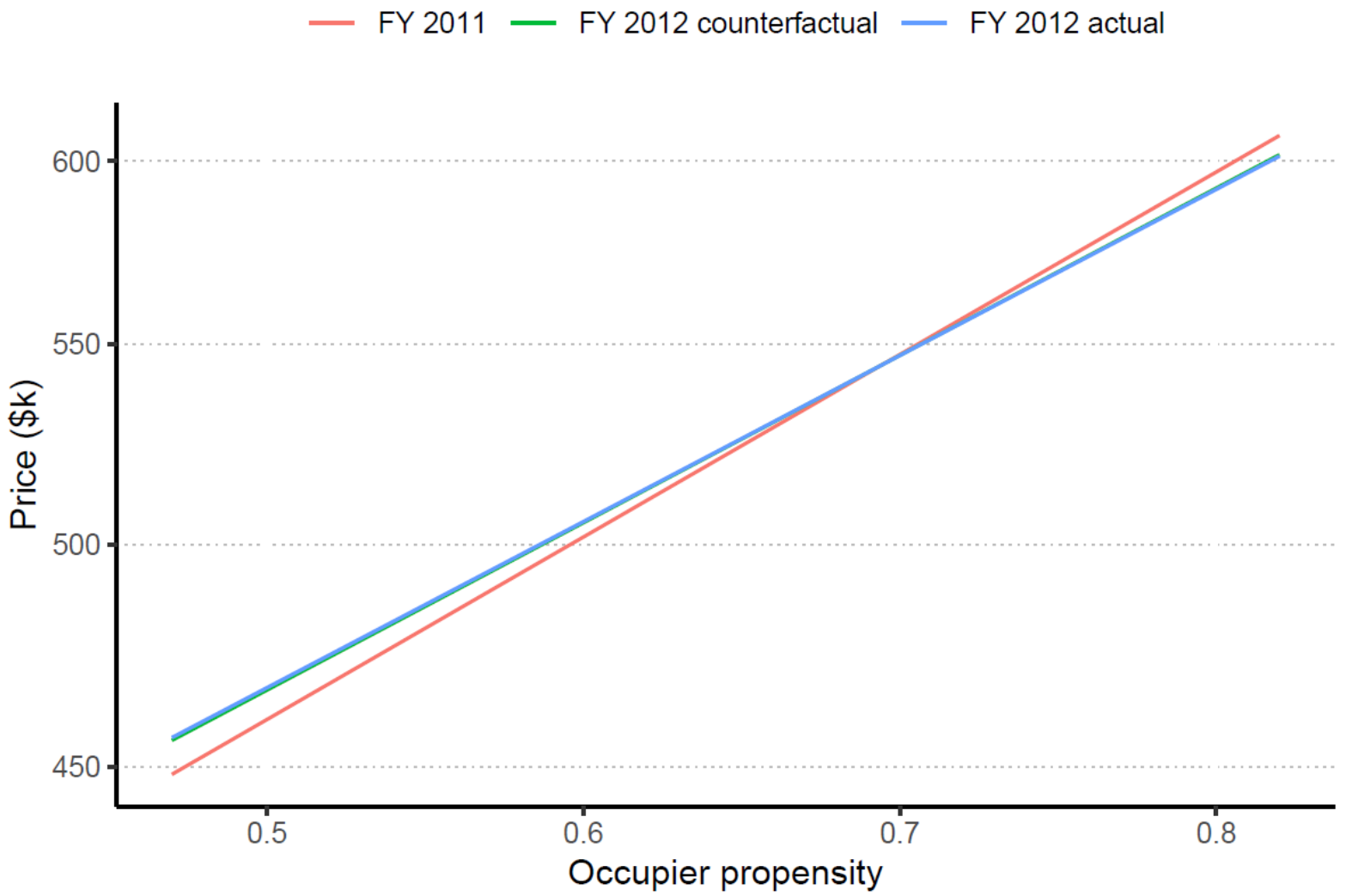
Estimated relationships between price and occupier propensity

Queensland, FY 2011−12



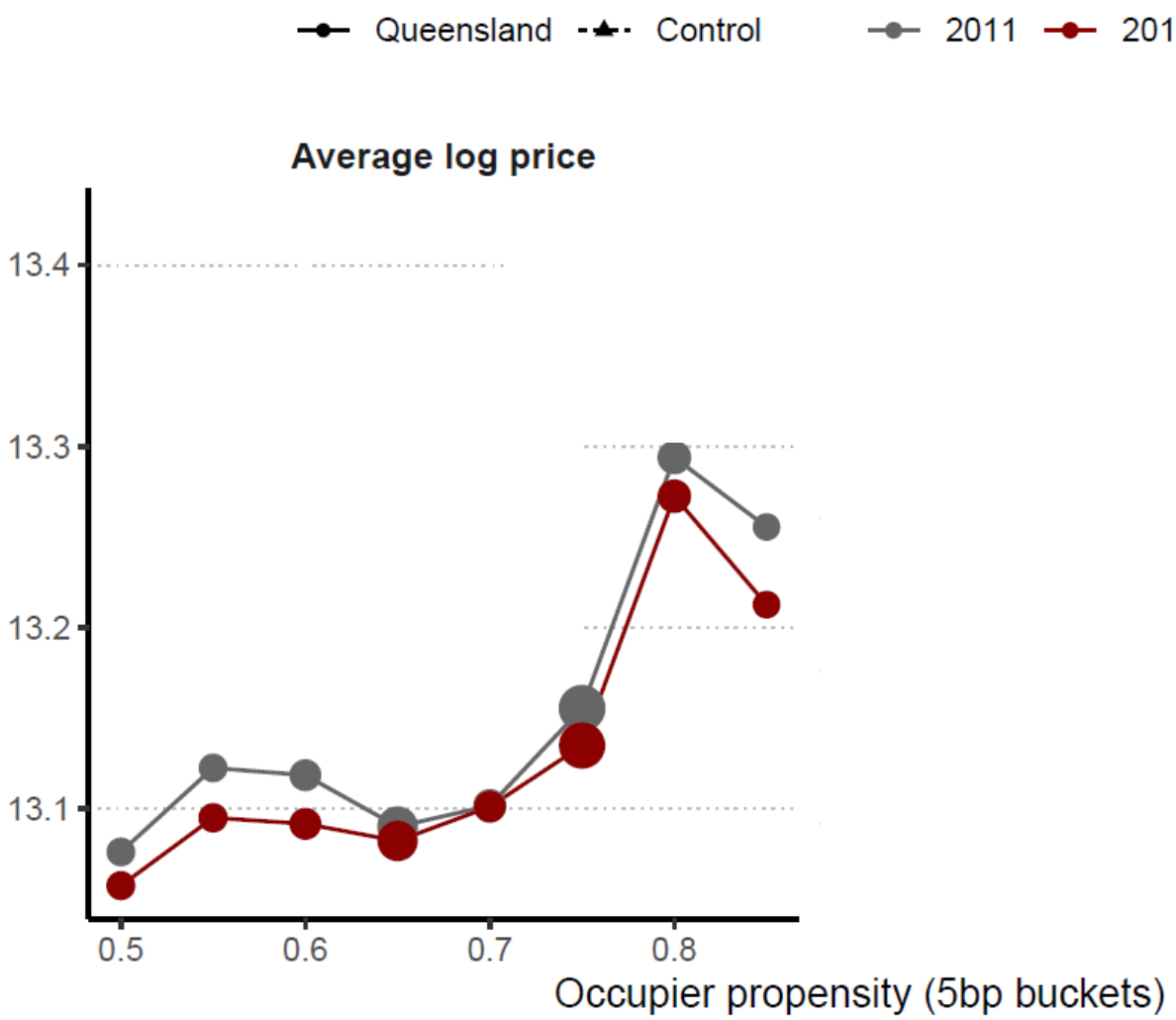
Estimated relationships between price and occupier propensity

Queensland, FY 2011−12



Occupier propensities and prices

Point size represents number of purchases



Price takeaways and other results

- No evidence of a negative price effect
  - Noting that demand effects through FHB are switched off by the policy design
  - But results are similar to Cho et al. (2024) modelling that has FHB channel
  - We also find little effect on prices relative to rents

- The composition of transacted housing did change.
  - Unsurprisingly, housing more exposed to the treatment was transacted less

- The raw data show a price decline that is driven by this compositional change

- Compositional changes may reconcile past literature differences
  - Besley, Meads and Surico (2014) control for composition and find no price effect
  - Best and Kleven (2018) do not, and find a strong price effect