

# The Effect of Credit on the Housing Market: Evidence from Restrictions on Investor Credit

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- Does the supply of mortgage credit affect the housing market?
  - ▶ Important in light of the falls in housing prices experienced after the financial crisis in 2007/08
  - ▶ Understanding the effects of changes in regulations governing mortgage credit
- From a theoretical perspective it is unclear how important the credit supply channel is to house price growth, sales and rents
  - ▶ Other factors such as housing supply, house price expectations, borrower quality and market segmentation can also have an effect
- Empirically challenging to determine the effects of changes in credit on the housing market
  - ▶ Reverse causality
- Seek to identify the casual effect of changes in the supply of mortgage credit on the housing market

## Introduction

- Look at changes in regulations introduced by APRA to reduce investor credit growth
  - ▶ Regulations governing the supply of the credit to owner occupiers were relatively unaffected
  - ▶ Compare what happens to investors relative to owner occupiers
- Find that these regulations led to a slow down in credit growth to investors relative to owner occupiers
- Exploit geographic variation in the share of the housing stock owned by investors
- Find that housing prices and sales volumes fell by more in regions where a greater share of the housing stock was owned by investors
- Rents were unaffected

## Changes in Investor Lending Regulations

- APRA introduced policies aimed at reducing investor lending
  - ▶ Dec 2014: Capped annual investor credit growth for any individual bank at 10 per cent
  - ▶ Mar 2017: Restricted the share of interest-only loans to be less than 30 per cent of an individual banks new lending
- Regulations governing the supply of credit to owner occupiers was largely unaffected.
- Regulations were introduced during a period in which APRA viewed investor credit growth as being strong.
- APRA was concerned about the systemic risk posed by rapid growth in investor lending

## Changes in Investor Lending Regulations

- APRA noted:

*“In this environment of rising household debt, APRA observed a loosening of mortgage lending standards as lenders competed for market share. . . The more significant risks appeared to be the unprecedented share of interest-only lending and loans for potentially speculative investment purposes, and that low interest rates in conjunction with lending methodologies were allowing larger loans to be extended relative to a borrower’s income... The Reserve Bank of Australia had expressed concern about emerging imbalances in the housing market, and noted that strong growth in investor activity could increase the risk of amplifying the housing price cycle.”*

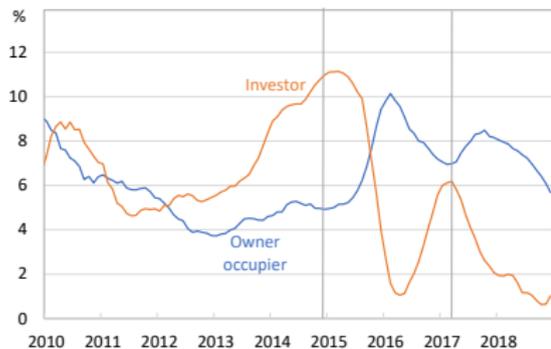
- Policies were designed to provide a “brake on growth in forms of lending that were contributing most to systemic risk” (APRA 2019, p.10).
- Banks who did not comply with these policies would face more intense supervisory action by APRA

## The Effects of Changes in Investor Lending Regulations on Credit

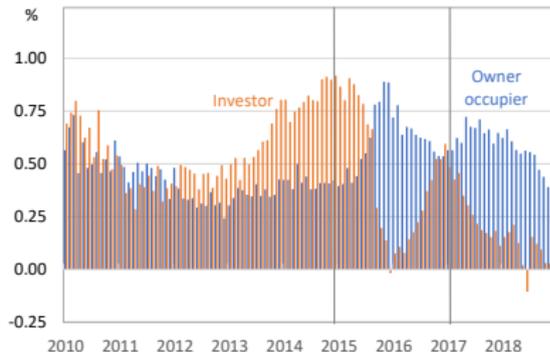
- Aggregate credit statistics
- Credit growth by bank

Figure: Housing Credit Growth  
Investor and owner occupier

(a) Six month annualized credit growth



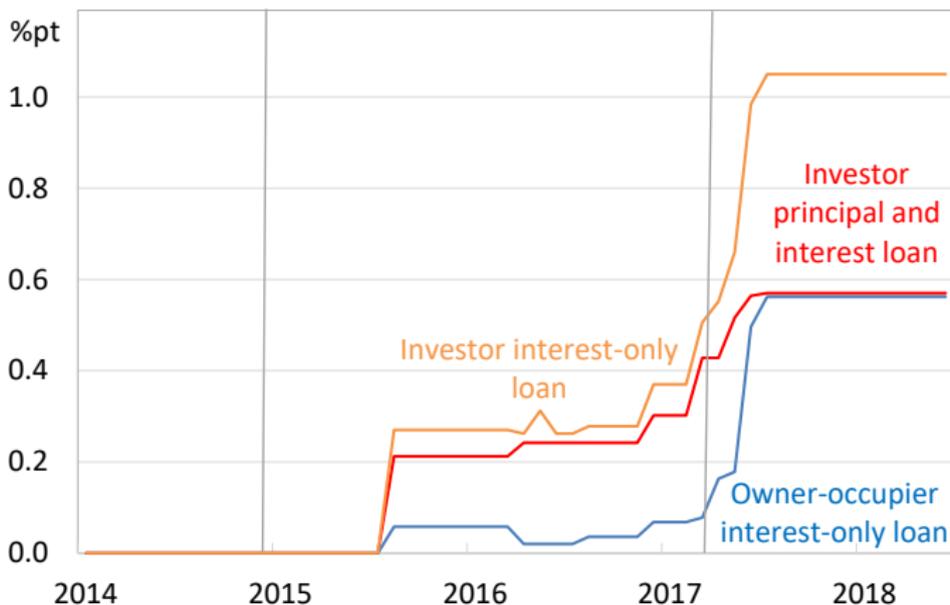
(b) Monthly credit growth



Notes: Panel (a) shows six month annualised credit growth for investors and owner occupiers; panel (b) does the same for monthly credit growth. Vertical lines indicate the dates when APRA introduced regulations placing a cap on investor credit growth and a cap on interest-only lending respectively.

Figure: Housing Interest Rates

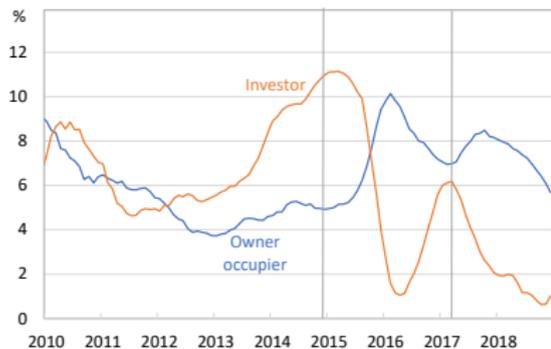
Spread relative to an owner-occupier principal and interest loan



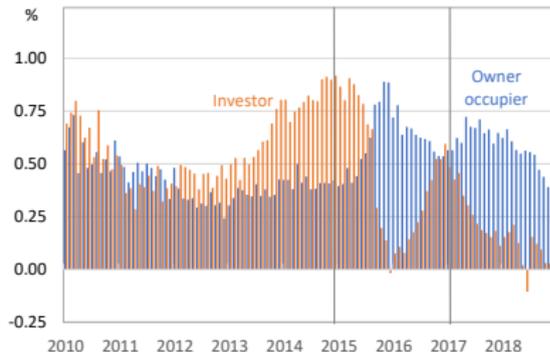
Notes: Advertised interest rates on variable interest rate loans. The spread in interest rates on investor interest-only, investor principal and interest and owner-occupier interest-only loans relative to owner-occupier principal and interest loans. Vertical lines indicate dates when APRA introduced regulations placing a cap on investor credit growth and a cap on interest-only lending respectively.

Figure: Housing Credit Growth  
Investor and owner occupier

(a) Six month annualized credit growth

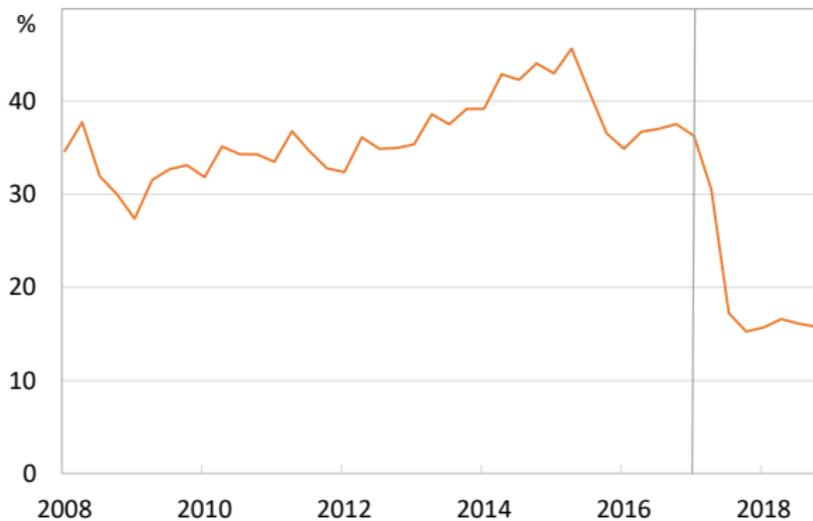


(b) Monthly credit growth



Notes: Panel (a) shows six month annualised credit growth for investors and owner occupiers; panel (b) does the same for monthly credit growth. Vertical lines indicate the dates when APRA introduced regulations placing a cap on investor credit growth and a cap on interest-only lending respectively.

**Figure: Interest-only Loan Approvals**  
The share of interest-only loans in new lending



Notes: The value of new interest-only loans as a percentage of the value of total new lending. The vertical line indicates the date when APRA introduced a cap on interest-only lending.

## The Effects of Lending Policies on Credit Growth for Individual Banks

$$\Delta \log(\text{credit}_{i,j,t}) = \alpha_{i,t} + \sum \beta_t (\mathbf{1}(\text{investor credit}_{i,t}) \times d_t) + \varepsilon_{i,j,t}$$

where:

- $i$  denotes bank,  $j \in \{\text{investor}, \text{owner occupier}\}$  denotes credit type and  $t$  time
- $\alpha_{i,t}$  is a bank  $\times$  time fixed effect
- $d_t$  is a dummy variable for quarter  $t$
- $\mathbf{1}(\text{investor credit}_{i,t})$  is an indicator variable that is equal to one if  $j=\text{investor}$
- Coefficients of interest are  $\{\beta_t\}_{t=t_0}^{t_1}$
- Weighted by total housing credit in 2014
- Standard errors are clustered at the bank level

Figure: Investor Credit Growth Relative to Owner-Occupier Credit Growth

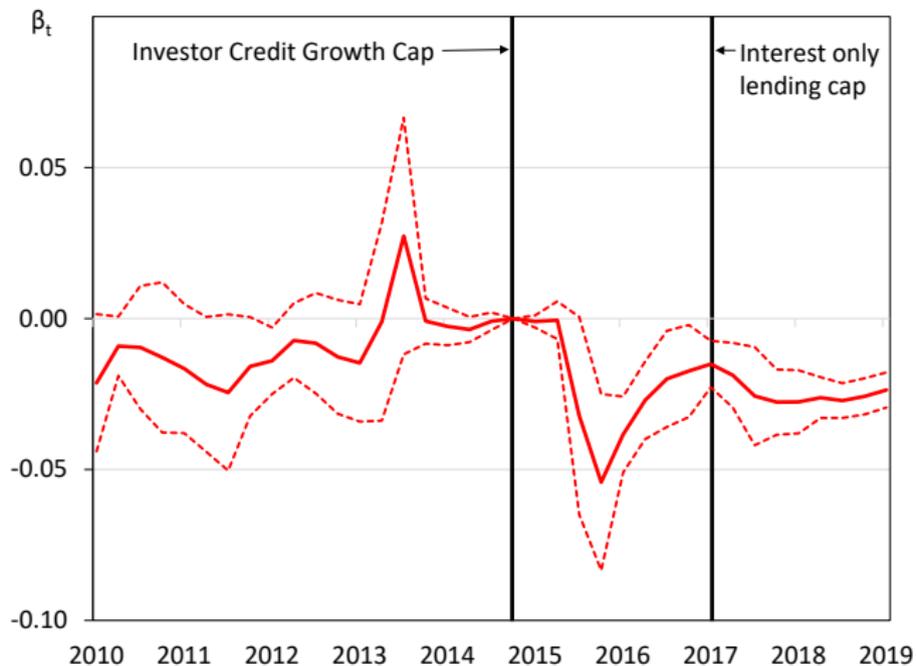
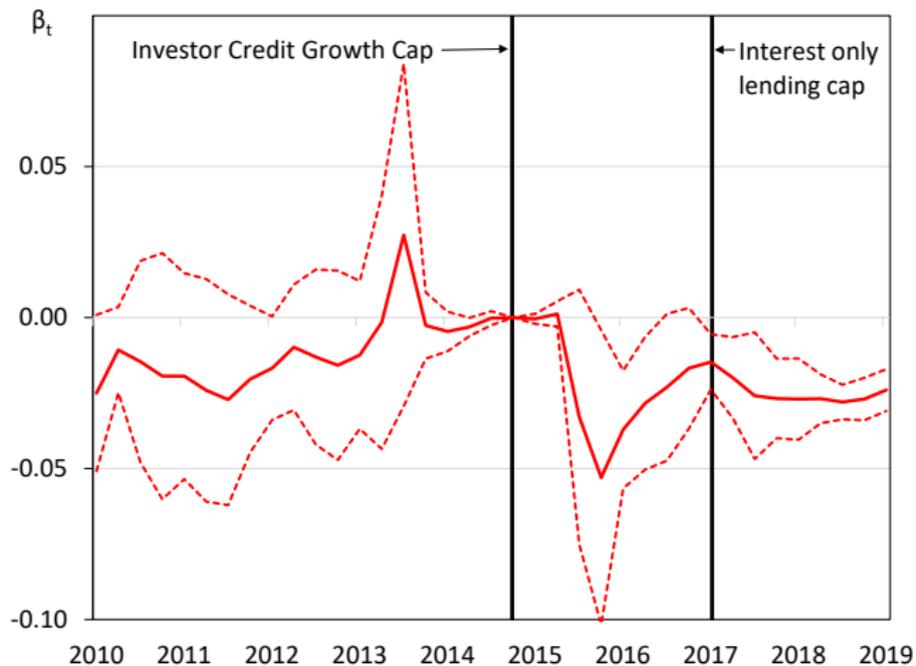


Figure: Investor Credit Growth Relative to Owner-Occupier Credit Growth  
Big-Four only



## Discussion

- We find that these regulations reduced credit growth for investors relative to owner occupiers
- APRA's policies were implemented during a period in which demand for investor credit and interest-only loans were strong
- Investor credit growth fell well below the 10 per cent cap and the share of interest-only loans fell well below the 30 percent cap.

## The Effects on the Housing Market

- We look at what effect the changes in the supply of credit had on housing prices, sales volumes and rents
- Exploit regional variation in the stock of housing owned by investors

## Data

- Data is at an SA3 level: 331 SA3s from 2010Q1 to 2018Q4
- **Housing data** is sourced from Core Logic: housing prices, sales volumes and rents
  - ▶ House prices and rents are measured using a hedonic index
- **The investor share** is from the Census: share of the housing stock owned by investors in an SA3
- Exclude public housing and housing provided by charities

**Table:** Correlations in the Investor Share Through Time  
2006, 2011 and 2016 Census

Census	Correlation coefficient			Spearman rank coefficient		
	2006	2011	2016	2006	2011	2016
2006	1.000			1.000		
2011	0.979	1.000		0.981	1.000	
2016	0.936	0.969	1.000	0.934	0.961	1.000

## The Effects of Changes in Credit on the Housing Market

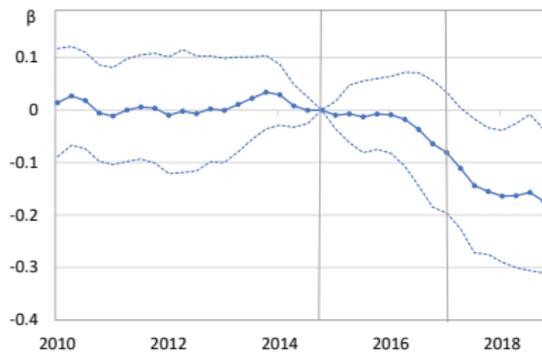
$$\log(\text{housing } ind_{i,t}) = \alpha_i + \sum \delta_j d_t + \sum \beta_t (\text{investor share}_i \times d_t) + \sum \sum \gamma_t (SA4_j \times d_t) + \varepsilon_{i,t}$$

where:

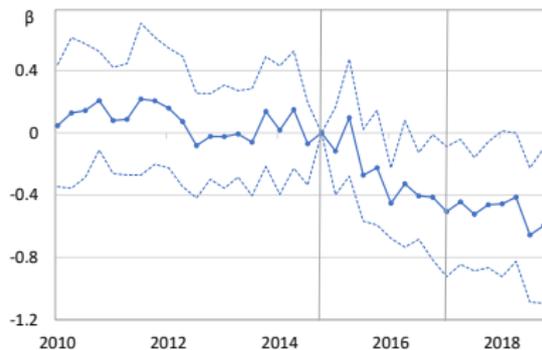
- $\text{housing } ind_{i,t}$  is housing prices, sales volumes (scaled by the housing stock), rents
- $\alpha_i$  is a dummy variable for SA3  $i$
- $d_t$  is a dummy variable for quarter  $t$
- $\text{investor share}_i$  is share of the housing stock in region  $i$  owned by investors
- $SA4_j$  is a dummy variable for a local labour market
- Coefficients of interest are  $\{\beta_t\}_{t=t_0}^{t_1}$
- SA3s are weighted according to the number of residential dwellings in that region
- Standard errors are clustered at an SA4 level

Figure: The Investor Share and Housing Indicators: Baseline Specification  
Coefficient on the Investor Share

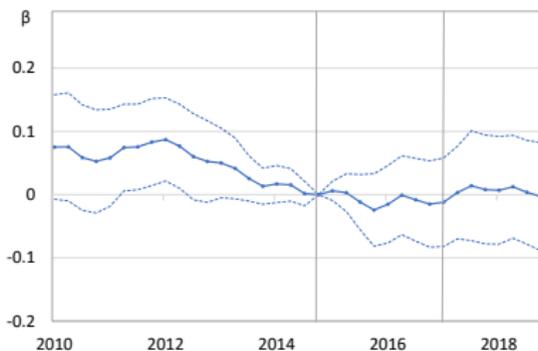
(a) Housing prices



(b) Sales volumes



(c) Rents



## Controlling for Cyclical Sensitivities

- Some regions maybe more sensitive to the nationwide house price cycle
- We measure a regions cyclical sensitivity by regressing house price growth in that region on nationwide house price growth
- Group regions into terciles based on their sensitivity to changes in national house prices

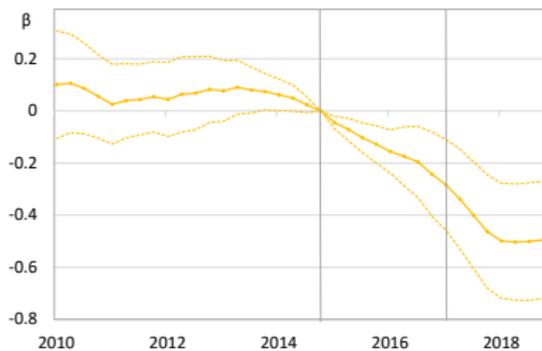
$$\log(\text{housing } ind_{i,t}) = \alpha_i + \sum \delta_j d_t + \sum \beta_t (\text{investor } share_i \times d_t) + \sum \gamma_t (TER_j \times d_t) + \varepsilon_{i,t}$$

where:

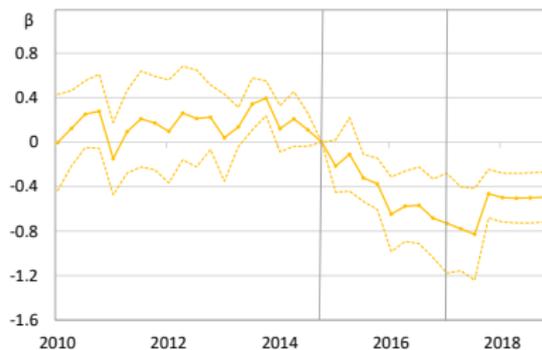
- $TER_j$  is a dummy variable equal to one if SA3  $i$  is in tercile  $j \in \{2, 3\}$

Figure: The Investor Share and Housing Indicators: Controlling for Cyclical Sensitivities  
Coefficient on the Investor Share

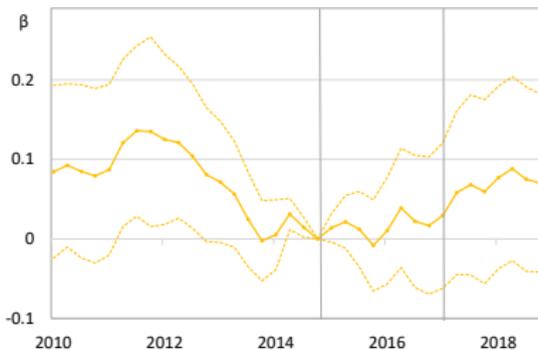
(a) Housing prices



(b) Sales volumes



(c) Rents



## Linear Projection

- Control for serial correlation in house price growth and for local economic conditions
- Adopt a local projection framework

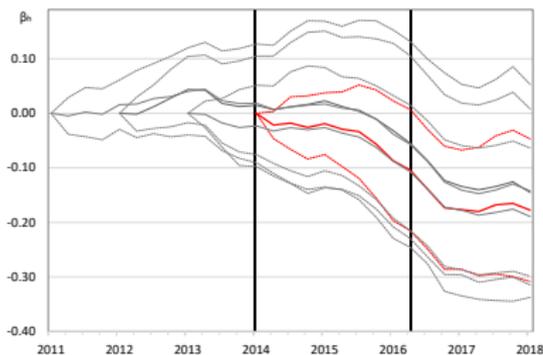
$$\Delta^h \log(\text{housing } ind_{i,t+h}) = \sum_{j=1}^8 \alpha_{h,t-j} \Delta \log(\text{housing } ind_{i,t-j}) + \beta_h \text{investor } share_i + \sum \kappa_{h,j} X_{i,j,t} + \sum \gamma_t SA4_j + \varepsilon_{i,t}$$

where:

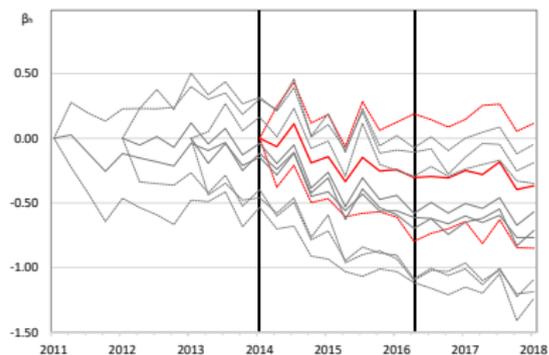
- $\Delta^h \text{housing indicator}_{i,t+h}$  is the percent change in the housing indicator in SA3  $i$  between 2014Q4 and 2014Q(4+h),  $h=\{1,2,\dots,16\}$ .
- $X_{i,j,t}$  are time-varying SA3 control variables: 8 lags of population growth, income growth and building approvals as a share of the housing stock
- Coefficients of interest are  $\beta_h$

**Figure:** The Investor Share and Housing Indicators: Local Projection Coefficient on the Investor Share

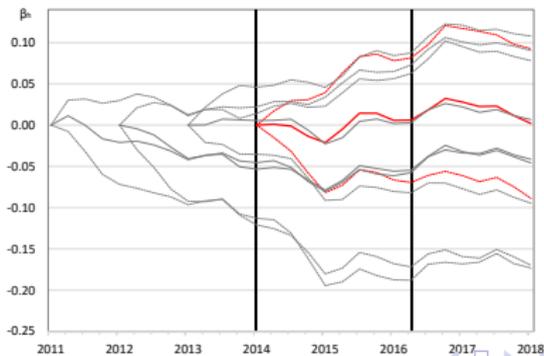
**(a) Housing prices**



**(b) Sales volumes**



**(c) Rents**



## Conclusion

- Does the supply of mortgage credit affect the housing market? Yes
- Regulations which restricted investor credit growth relative to owner-occupier credit growth led to a fall in housing prices and sales volumes in regions where investors owned a larger share of the housing stock.
  - ▶ The falls in prices and volumes were persistent
- Rents were unaffected

- Break down the effects by apartments and houses
- This result has implications for how rental housing should be treated in models
  - ▶ Our results suggests that there are frictions between investor and owner-occupied housing
  - ▶ Models often assume that the two are perfect substitutes
  - ▶ Models with rental housing suggests that credit plays only a small role in influencing house prices. Our evidence points to credit playing an important role in the presence of rental housing