

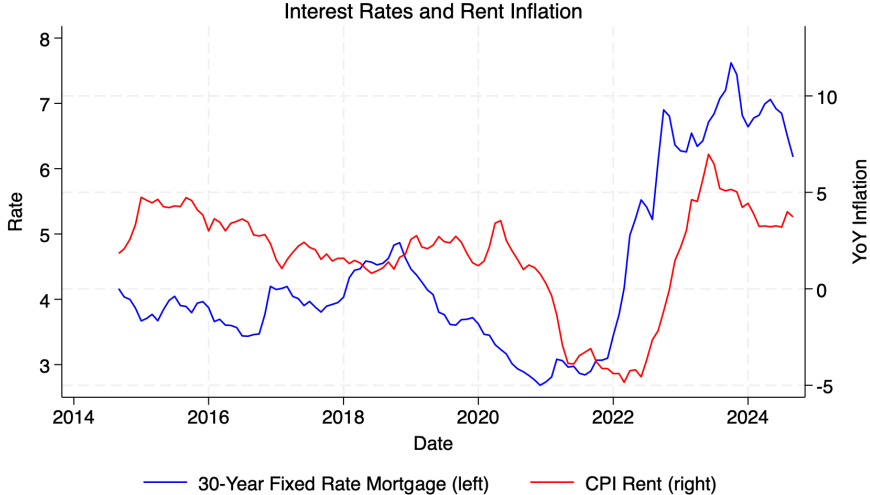
Monetary Policy and Rents

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Pablo De Llanos¹
Lu Han²

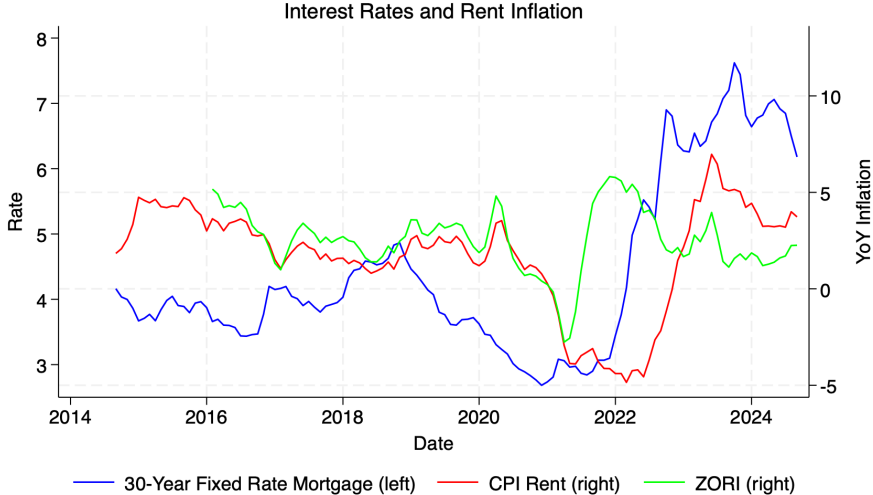
¹Columbia University
²University of Wisconsin

November 15, 2024

Motivation

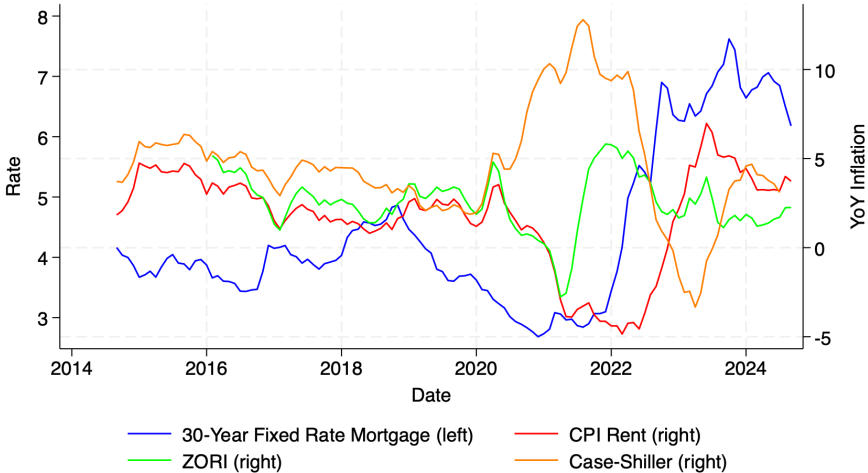


Motivation



Motivation

Interest Rates, Rent Inflation, and House Price Inflation



This Paper

- **What is the effect of monetary policy on rents?**

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- ▶ Higher interest rate can lower rents by reducing demand ($\frac{\partial rent}{\partial i} < 0$)

Intertemporal substitution, contraction of labor demand and income

(Kaplan, Moll, Violante 2018; Auclert 2019; Cloyne, Ferreira, Surico 2024)

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- ▶ Higher rate can increase rents by crowding in homebuyers ($\frac{\partial rent}{\partial i} > 0$)

Higher borrowing costs constrain buyers, mortgage lock-in limits supply
(Gete and Reher 2018, Lu and Fonseca 2023, Ringo 2024)

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- **Why is the effect of monetary policy on rents important?**

- ① Distributional effects of MP - most vulnerable households are renters
- ② Ability of MP to control inflation depends on how MP affects rents

Rents account for 36% of CPI

What We Do

- Construct a new repeat-rent index (ADH-RRI)
 - ▶ Using national database of rental listing
 - ▶ Advantages of ADH-RRI relative to other rent indices:
 - ① A more granular geographical coverage
 - ② A wider temporal coverage
 - ▶ Provide new measures of rent inflation
For wide host of previously unobserved zip-codes and time-periods

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 - ▶ Provide new measures of rent inflation
For wide host of previously unobserved zip-codes and time-periods
- Estimate impulse responses of rents to monetary policy shocks
 - ▶ By employing local projection methods (Jordà, 2005)
 - ▶ Exogenous MP shocks from Bauer-Swanson (2023) MP surprises
 - ▶ Replicate analysis for a host of alternative MP shocks

What We Find

- Contractionary monetary policy shock increases rent
 - 25bps increase in mortgage rate \rightarrow 1.7% increase in **real** rent
 - 25bps increase in mortgage rate \rightarrow 1.4% increase in **nominal** rent
- Effect driven by single-family rents

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- Effect driven by single-family rents
- Mechanisms (ongoing work):
 - ▶ Heterogeneous effects by mortgage lock-in
 - ▶ Effect of MP on rent-own transitions
 - ▶ Heterogeneous effects by supply elasticities

Literature

- **Rent indices:** Bailey et al. (1963); Case and Shiller (1989); Ambrose, Coulson, Yoshida (2015, 2023); Clark (2022); Adams et al. (2024)
- **Monetary policy and housing:** Case and Shiller (1989); Kuttner (2014); Williams (2015); Gete and Reher (2018); Dias and Duarte (2019); Koeniger, Lennartz, Ramelet (2022); Gorea, Kryvtsov, Kudlyak (2022); Ringo (2024); Lazarowicz and Richard (2024)
- **Mortgage lock-in:** Quigley (1987); Ferreira, Gyourko, Tracy (2010); Liu and Fonseca (2023); Batzer et al. (2024); Liu, Fonseca, Mabile (2024), De la Roca, Giacoletti, Liu (2024), Liebersohn and Rothstein (2024); Gerardi, Qian, Zhang (2024)
- **Distributional effects of monetary policy:** Coibion, Gorodnichenko, Kueng (2017); Auclert (2019); Luetticke (2021); Amberg et al. (2022)

Outline of the talk

- ① Data
- ② Repeat-Rent Index
- ③ Effects of Monetary Policy

Data

Rental Listings

- Rental listing data compiled by Altos Research (2011-2022)
- National database, compiled from online listing platforms and MLS
- Data provides weekly snapshot of observed rental listings
 - ▶ Listed monthly rent, week listing observed, address, number of beds and baths, floor size, property type, year built, amenities

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- Sample selection:
 - ▶ Multi-family + single-family units (drop short-term, mobile, commercial)
 - ▶ Drop listings with incomplete information or extreme rents

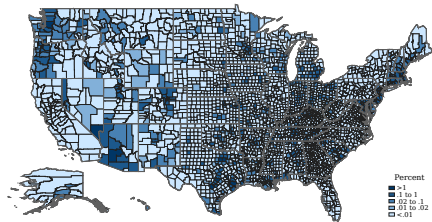
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 - ▶ Listed monthly rent, week listing observed, address, number of beds and baths, floor size, property type, year built, amenities
- Identifying listings of the same unit across time (required for RRI)
 - ▶ Identify units by address, number of beds, number of baths
 - ▶ In the data, buildings have multiple units with same beds and baths
 - ▶ Not an issue for RRI as long as these units are of the same quality
 - ▶ For conservativeness, drop tuples of (address, beds, baths) for which multiple listings with different prices observed within same week

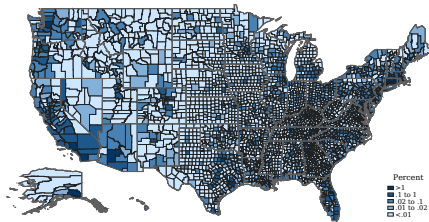
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- Monthly panel of listings at the unit level (43M obs, 10.8M units)

Geographical Coverage



(a) Altos



(b) ACS

For each county, compute share of rental units in US that are in that county

Summary Statistics

	Rent (2015 USD)	Built	Sqft	Beds	Baths	% in SF
sample						
ACS	1090	1977	.	1.9	.	30
AHS	1233	1974	1160	2.1	1.5	35
Altos	1420	1973	1543	2.7	1.9	39
ZORI	1386

Repeat-Rent Index

ADH-RRI

- RRIs provide a quality-constant measure of rent growth

Bailey et al. (1963); Case and Shiller (1988), Ambrose et al. (2015)

ADH-RRI

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- RRI is constructed by estimating:

$$\log P_{i,t} - \log P_{i,s} = \gamma_1 D_{i,1} + \gamma_2 D_{i,2} + \dots + \gamma_N D_{i,N} + \varepsilon_{i,t,s}$$

$P_{i,t}$ = rent on the i th rental unit at month t

$P_{i,s}$ = rent on the i th rental unit at month s , $t > s$

$D_{i,k} = 1$ if second observation in pair took place in month k

$D_{i,k} = -1$ if first observation in pair took place in month k

- $\{\gamma_1, \dots, \gamma_N\}$ represent percentage change in rents wrt to base month

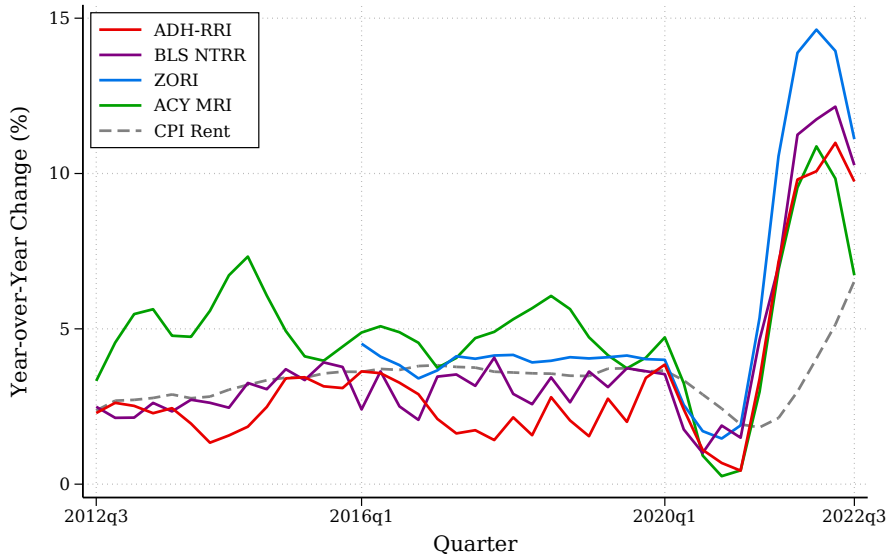
$$ADHRRRI_t = 100 \exp(\gamma_t)$$

ADH-RRI

- RRIs provide a quality-constant measure of rent growth
Bailey et al. (1963); Case and Shiller (1988), Ambrose et al. (2015)
- Different specifications of RRI
 - ▶ Nominal vs. real
 - ▶ New listings vs. all listings
 - ▶ Zipcode level vs. national level
 - ▶ Single-family vs. multifamily vs. all
 - ▶ Monthly vs. quarterly

Comparison to Alternative Rent Indices

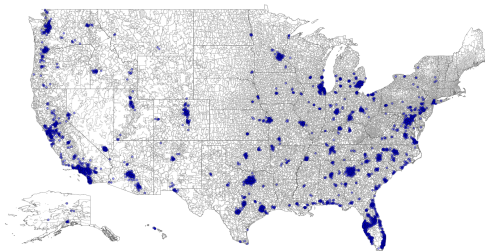
▶ ZORI



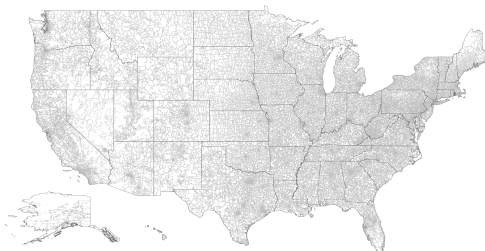
Advantage of ADH-RRI

- Broader, more granular, geographical coverage relative to alternatives
 - ▶ ADH-RRI computed at zipcode level
 - ▶ CPI computed only at CBSA level
 - ▶ ACY-MRI, NTRR, ATRR computed only at national level
 - ▶ ZORI computed at zipcode level but covers less zipcodes and less periods

ADH-RRI vs. ZORI (2011)

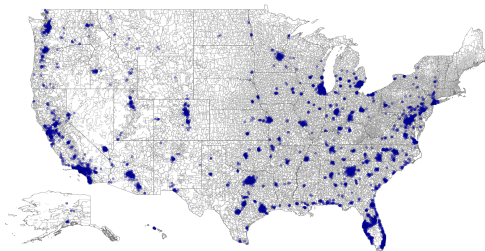


ADH-RRI (4,085 Zip Codes)

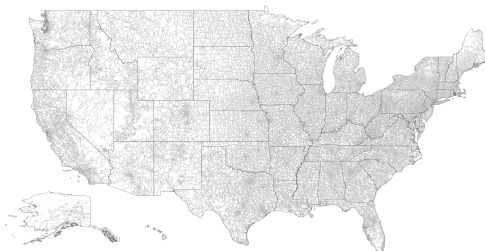


ZORI (0 Zip Codes)

ADH-RRI vs. ZORI (2013)

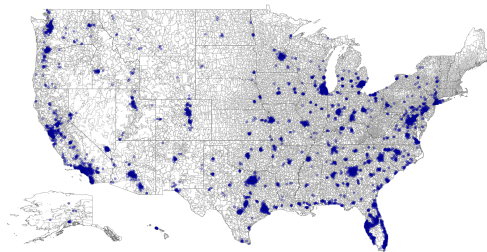


ADH-RRI (4,898 Zip Codes)

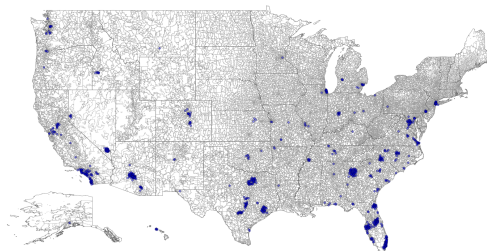


ZORI (0 Zip Codes)

ADH-RRI vs. ZORI (2015)

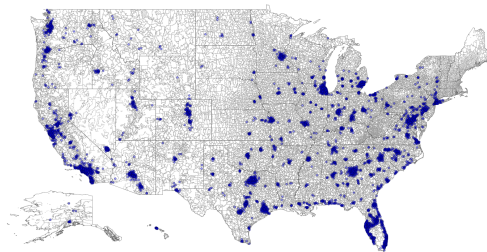


ADH-RRI (5,278 Zip Codes)

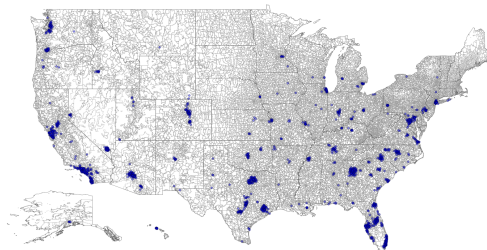


ZORI (1,004 Zip Codes)

ADH-RRI vs. ZORI (2017)

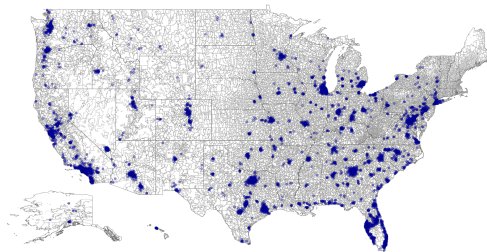


ADH-RRI (5,279 Zip Codes)

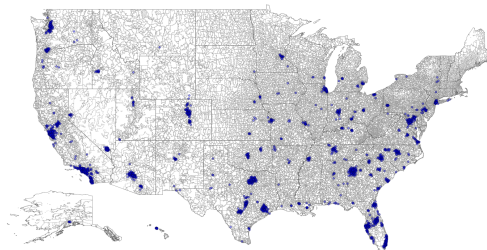


ZORI (1,834 Zip Codes)

ADH-RRI vs. ZORI (2019)

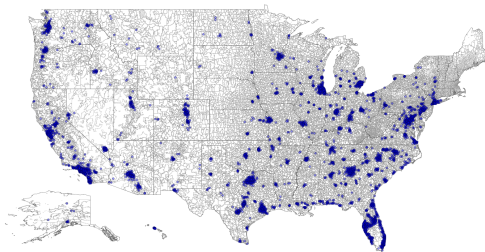


ADH-RRI (5,183 Zip Codes)

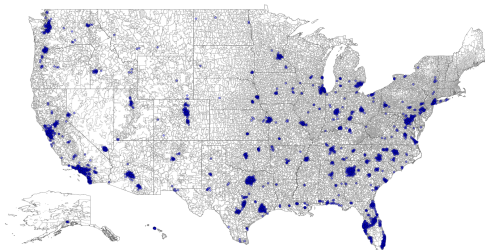


ZORI (2,308 Zip Codes)

ADH-RRI vs. ZORI (2021)



ADH-RRI (5,096 Zip Codes)



ZORI (3,410 Zip Codes)

Effect of Monetary Policy

Local-Projection Instrumental-Variable (LP-IV)

- Standard framework for estimating dynamic effects of MP shocks
Jordà (2005); Jordà et al. (2015); Ramey (2016); Stock and Watson (2018)

$$\begin{aligned} \log ADHRRR_{z,t+h} - \log ADHRRR_{z,t-1} = \\ \alpha_z^{(h)} + \beta^{(h)} i_t + \Gamma^{(h)} X_{z,t-1} + \varepsilon_{z,t+h} \end{aligned} \tag{1}$$

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LHS = growth rate of rent in zipcode z between $t-1$ and $t+h$ ($h = \{0, 1, \dots, 24\}$)

$\alpha_z^{(h)}$ = zip fixed effect

i_t = interest rate (30-year FRM)

$X_{z,t-1}$ = zipcode controls (including lagged $ADHRRR$) and macro controls

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 - Measure changes in rates around FOMC meetings + Fed chair speeches
 - Orthogonalize MP surprises by regressing them on pre variables

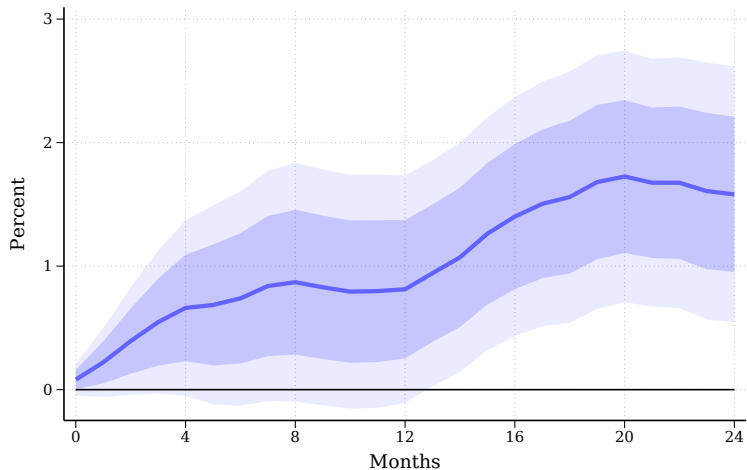
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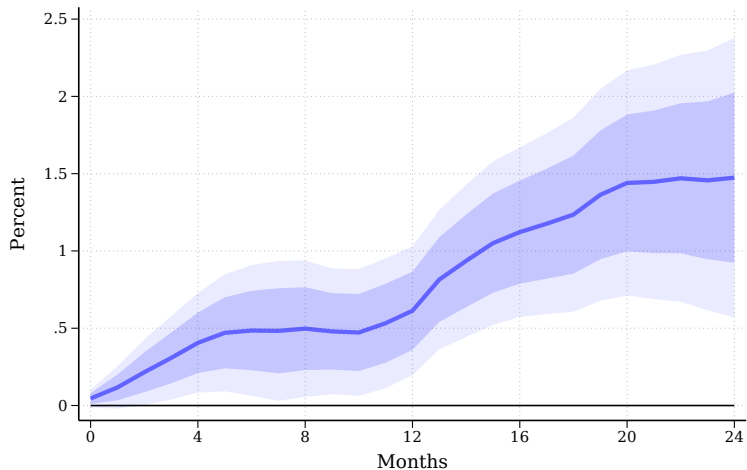
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- Replicate analysis for a host of alternative MP shocks
Gürkaynak et al. (2005); Gertler Karadi (2015); Nakamura Steinsson (2018)

Results



25bps increase in the 30-year fixed mortgage rate \Rightarrow 1% (1.7%) increase in **real** rent

Results - Nominal Rents



If contractionary MP raises rents ($\approx 35\%$ of CPI), this limits its ability to lower inflation

Robustness

- Alternative MP shocks [▶ detail](#)

Gürkaynak et al. (2005); Nakamura Steinsson (2018); Swanson (2021)

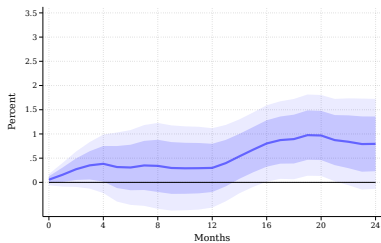
- ZORI [▶ detail](#)

- CPI [▶ detail](#)

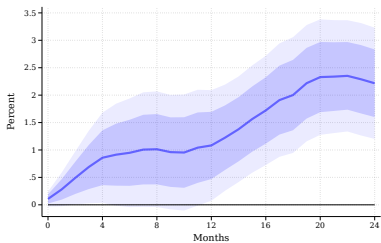
- ACY-MRI [▶ detail](#)

- Falsification [▶ detail](#)

Multi-Family vs. Single-Family



(a) Multi-Family



(b) Single-Family

Concluding Remarks

Conclusion and Next Steps

- Estimate the effect of MP on rents
- Construct a new RRI using rental listing data
 - Broader and more granular geographical coverage relative to alternatives
- Main finding: rent increases following a contractionary MP shock
 - A 25bps exogenous increase in mortgage rate lead to 1.7% increase in rent
- Policy implications:
 - ▶ Distributional effects of MP
 - ▶ Effective conduct of MP

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- Policy implications:
 - ▶ Distributional effects of MP
 - ▶ Effective conduct of MP
- Next steps:
 - ▶ Heterogeneous effects by supply elasticities
 - ▶ Heterogeneous effects by mortgage lock-in
 - ▶ Effect of MP on rent-own transitions

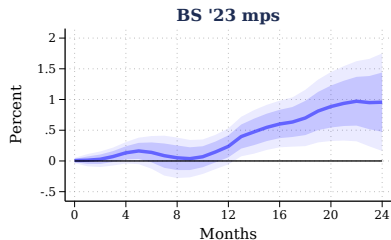
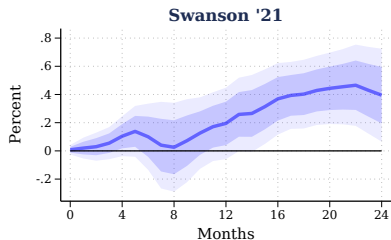
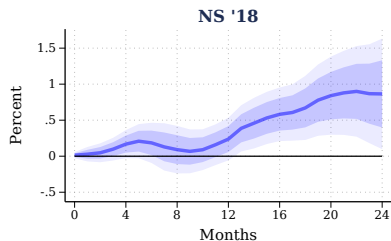
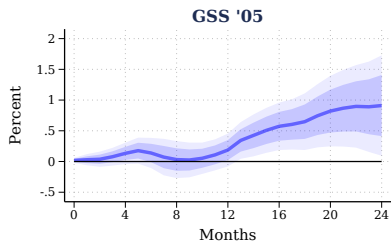
Thank You!

Appendix

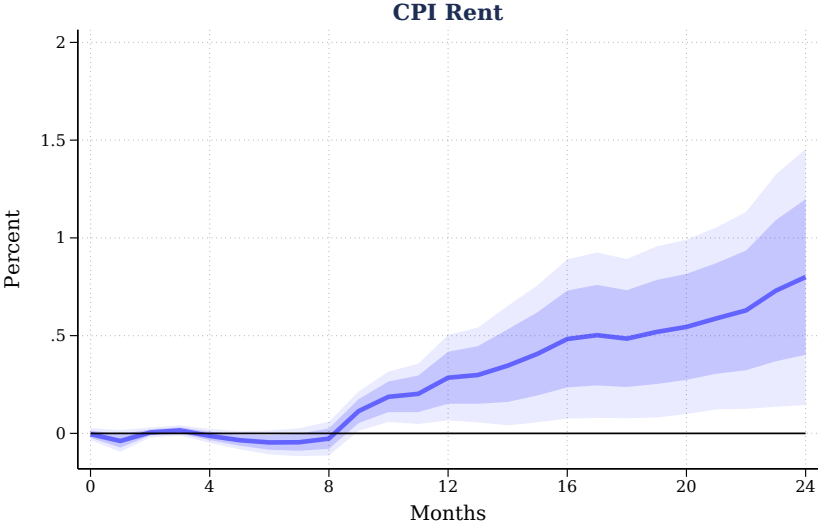
	OLS			
	Log ADH-RRI		Δ_{YoY} Log ADH-RRI	
	(1)	(2)	(3)	(4)
Log ZORI	0.827*** (0.005)	0.846*** (0.003)	.	.
Δ_{YoY} Log ZORI	.	.	0.649*** (0.005)	0.615*** (0.006)
Zip Code FEs	No	Yes	No	Yes
R-squared	0.889	0.957	0.604	0.655
Observations	183,374	183,341	139,752	139,707

Alternative Monetary Policy Shocks

▶ Back



Effect of Monetary Policy on CPI Rent Inflation

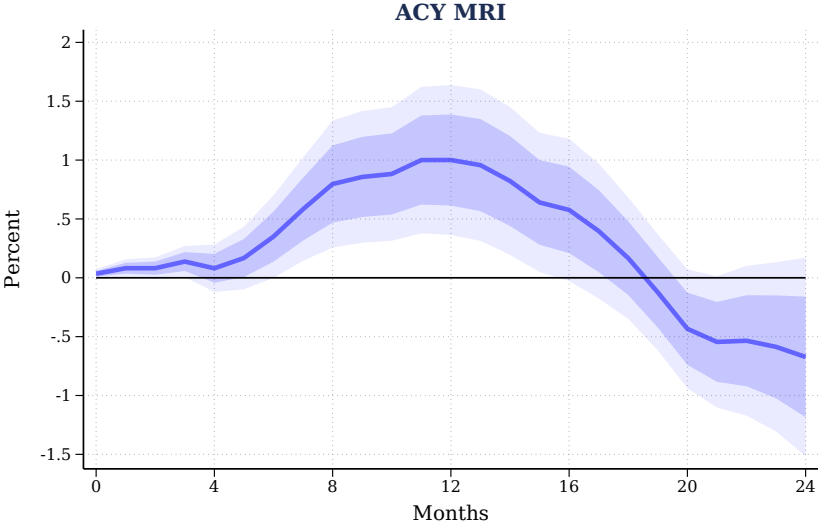


Effect of Monetary Policy on ZORI Rent Inflation

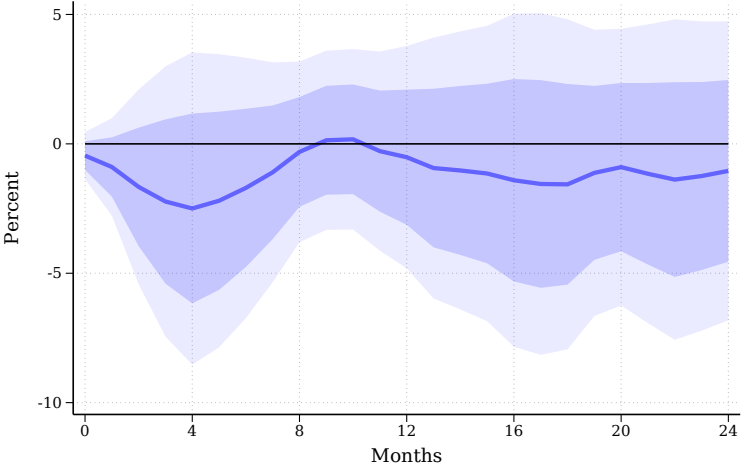
▶ Back

Effect of Monetary Policy on ACY-MRI Rent Inflation

▶ Back



Falsification



Impulse response of real rents to randomly drawn MP shock [▶ Back](#)