

Inflation Through the Mortgage Market

Arpit Gupta (NYU Stern), Christopher Hansman (Emory), and Pierre Mabilie (INSEAD)

July 23, 2026

QE Induced Deterioration in Affordability?

- Historic surge in house prices, rents, and consumer prices:
 - Case-Shiller +10% (2020) +19% (2021); CPI +7% (2021)
 - Price-to-income ratios and payment burdens for new buyers at record highs
- Coincided with unprecedented fiscal and monetary intervention:
 - Fed purchased \$1.4T in Agency MBS (2020–2022)
 - Housing is largest household asset, mortgages the largest liability, making it an important transmission mechanism for monetary policy

Research Question: How much did unconventional monetary policy affect the affordability of housing and consumer goods?

We find Evidence for Inflationary Consequences of QE

- Connecting policy to affordability is hard:
 - Interest rates are **endogenous** to economic conditions. Especially in this time period: simultaneous supply and demand shocks
 - **Missing Intercept**: Hard to go from cross-sectional estimates to aggregate
 - House prices, rents, goods prices adjust together. Challenging to estimate welfare in **GE**
 - Our approach: quasi-experimental variation from mortgage market segmentation (identification) disciplines a dynamic spatial equilibrium model (aggregation and welfare)
- Key finding:** QE4 and drove excess house price and consumer good inflation, with costs borne by young renters displaced from home ownership

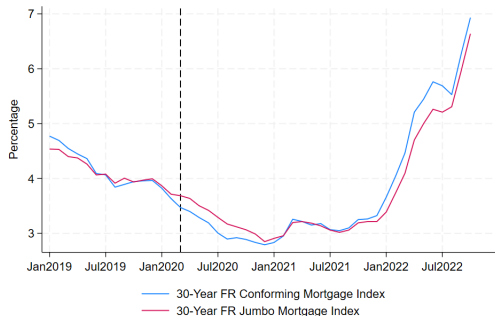
Background on QE

Identification Strategy: Mortgage Market Segmentation

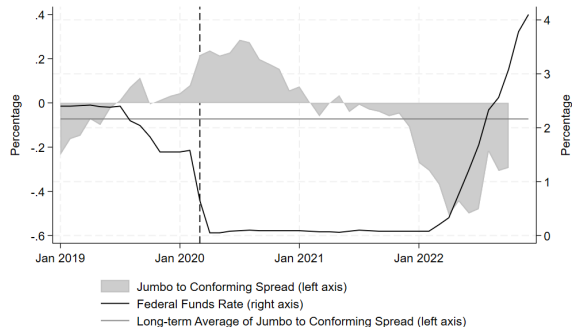
- Fed purchases target *conforming* loans below the national limit
 - Conforming loans $\leq$ national loan limit $\Rightarrow$ eligible for TBA pools
 - Jumbo pools and “super-conforming” pools above the local limit $\Rightarrow$ not purchased
- Results in differential rate impacts across mortgage segments
 - Conforming rates fell 20–40 bps below jumbo rates during QE4
Adelino et al. (2025); DeFusco et al. (2020); DeFusco and Paciorek (2017); Fuster et al. (2022)
 - Pre-pandemic spread: jumbo rates $\sim$ 10 bps *lower* than conforming
 - Also provides **cross-sectional** variation based on regional exposure to different segments

Mortgage Interest Rates and Spreads

Timing of Jumbo-Conforming Spread Moving Lines up with Policy Actions

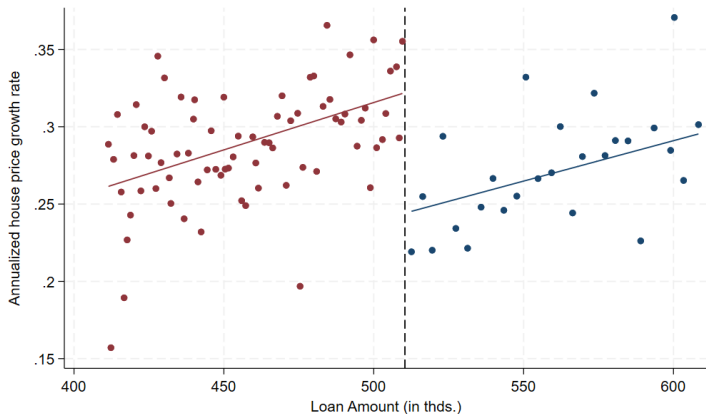


Mortgage Rates Over Time



Conforming-Jumbo Spread

Discontinuity in House Prices for Properties Exposed to QE Purchases



Data: Infutor Deeds data, 2020. House price growth around the conforming loan threshold (\$510,400 in 2020), properties to the left are treated by QE purchases. House price growth is measured through repeat sales for properties attached to the mortgage. [Table](#) [House Price Discontinuity](#)

Quasi-Experimental Shift-Share Instrument

We Generate Shift-Share Exposure to QE Shock

Key Benefit: Gives us Exogenous Interest Rate Exposure

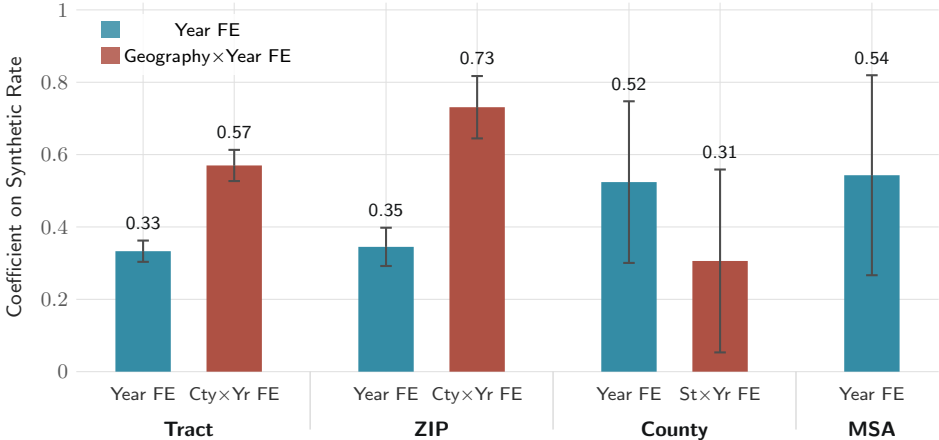
Interact national segment rates with predetermined local exposure:

$$\text{synthetic rate}_{zt} = s_{z,2018}^J \cdot r_t^J + s_{z,2018}^C \cdot r_t^C + s_{z,2018}^{FHA} \cdot r_t^{FHA}$$

- $s_{z,2018}^k$: Region (i.e., ZIP) z 's 2018 origination share in segment k (from HMDA)
- Segments: Jumbo (J), Conforming (C), FHA
- Variation: local differential exposure $\times$ time-varying segment rates
- Shares fixed in 2018

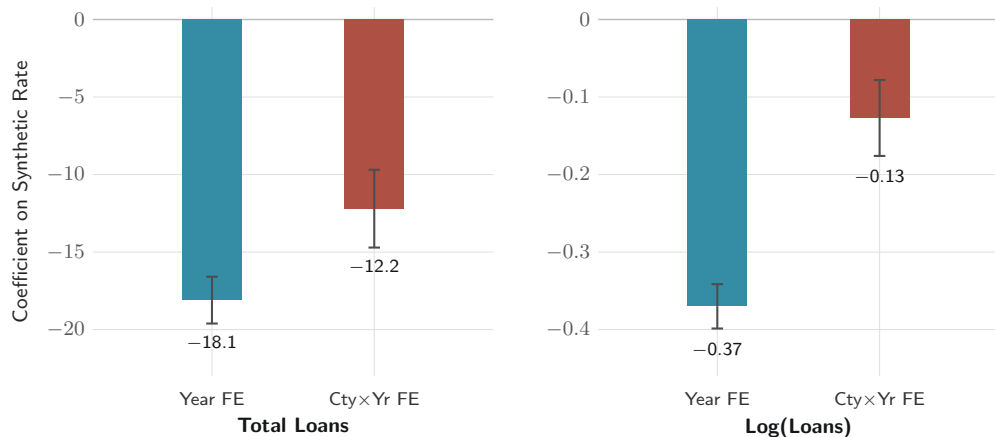
Reduction in Synthetic Rate Reduces Mortgage Rates

Estimate passthrough of 0.31–0.73 from synthetic rate shock to realized local mortgage rates



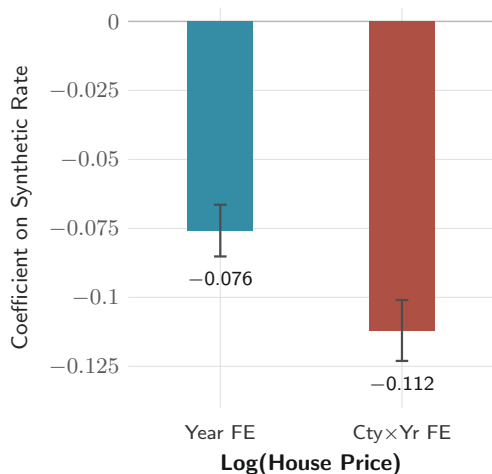
Reduction in Synthetic Rate Increases Mortgage Quantities

Semi-elasticity of interest rates to new loan origination of -0.13



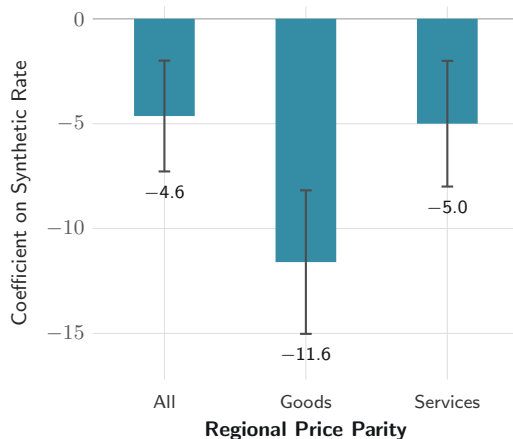
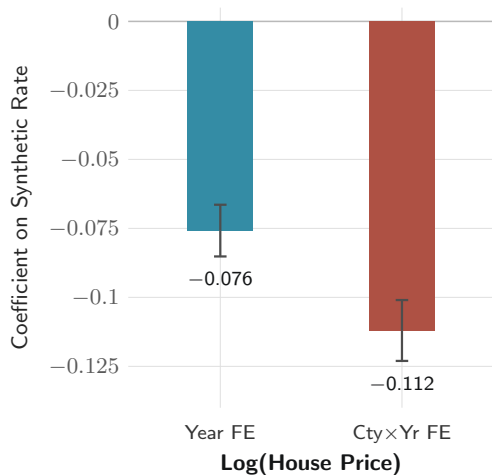
Reduction in Synthetic Rate Increases House and Consumer Prices

Semi-elasticity of interest rates on house prices of -0.11 , on regional inflation of -0.05



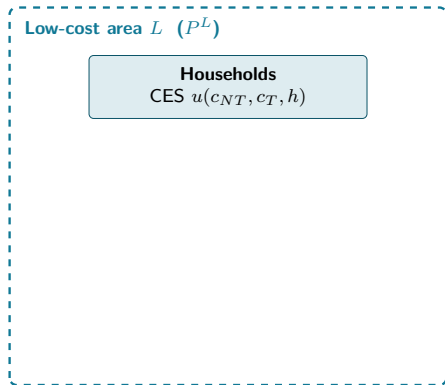
Reduction in Synthetic Rate Increases House and Consumer Prices

Semi-elasticity of interest rates on house prices of -0.11 , on regional inflation of -0.05

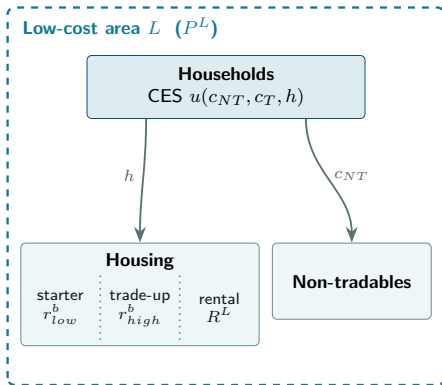


Structural Model

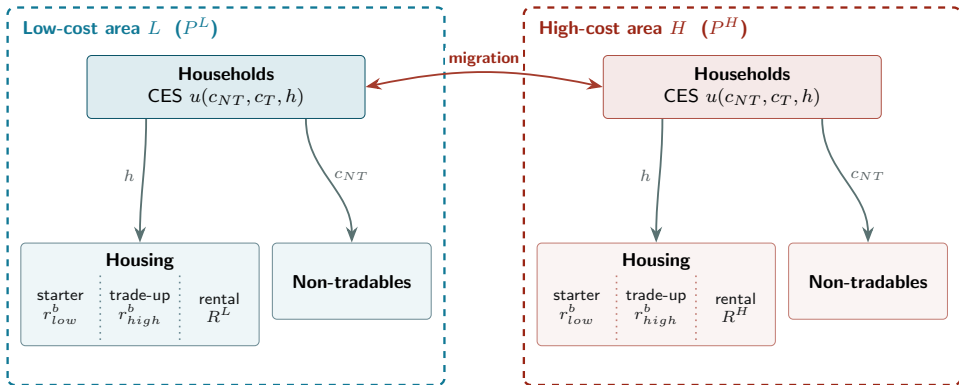
Model Overview



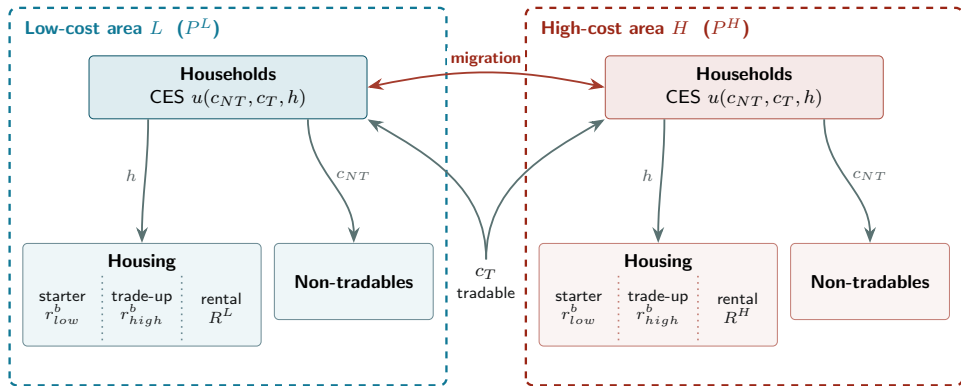
Model Overview



Model Overview



Model Overview



- Unconventional monetary policy reduces r_{low} relative to r_{high} , which affects L more
- Non-tradables and housing markets clear locally, tradables clear across both regions

Key Model Innovations

1. **Connecting housing and consumer goods choices**

- Endogenous tradable and non-tradable goods prices respond to housing market conditions
- Captures spillovers from mortgage policy to consumer inflation

2. **Optimal refinancing with rate lock-in**

- Fixed-rate mortgages: borrowers keep initial rate until move/refinance
- Conforming vs. jumbo rates based on loan size threshold $\bar{b}$
- Individual mortgage rate r_0^b is a state variable
- Generates endogenous lock-in effects

Numerical challenge: Rich state space with 7 market-clearing conditions solved over full transition dynamics

Calibration: Key Parameters

External

- Risk aversion $\gamma = 2$
- Risk-free rate $r = 2\%$
- Conforming rate: 3%–4%
- Jumbo rate: 3.3%–4%
- Housing depreciation: 2.45%
- Supply elasticities from Baum-Snow et al. (2023)

Internal (SMM)

- House prices & rents by area
- Income ratio H/L: 1.20
- Moving rate: 5%
- Homeownership: 64–66%
- Wealth/income: 4.50
- Default rate: 2%
- Refinancing response to QE

Model Fit: Targeted Moments

Variable	Data	Model
A. Average House Prices and Rents		
Avg house price low-cost starter homes	193,327.996	193,327.996
Avg house price low-cost trade-up homes	223,222.878	223,222.878
Avg rent low-cost	1,181	1,181
Avg house price high-cost starter homes	390,773.63	390,773.63
Avg house price high-cost trade-up homes	478,411.189	478,411.189
Avg rent high-cost	2,070	2,070
B. Average Income, Moving and Homeownership Rates		
Avg income high/low-cost	1.20	1.41
Avg moving rate between areas	0.05	0.05
Homeownership low-cost areas	0.66	0.65
Homeownership high-cost areas	0.64	0.60
C. Wealth, Expenditure Ratios, Default and Refinancing Rate		
Avg wealth/avg income	4.50	4.01
Avg house price/avg income	5.60	5.59
Avg rent/avg income	0.20	0.20
Non-tradable/(non-tradable + tradable) goods share	0.50	0.49
Avg default rate	0.02	0.05
Increase in fraction of refinanced mortgages during QE	+0.25	[+0.17, +0.54]

Notes: Moments are annualized.

Validation: User Cost Benchmark, Data, and Model

Difference-in-differences (low- vs. high-cost areas, per 100 bp):

$$DiD = \frac{\Delta \log P_L - \Delta \log P_H}{\Delta \bar{r}_L - \Delta \bar{r}_H}$$

	Data	Model
DiD estimate (per 100 bp)	-11.2%	-12.9%

User cost benchmark. With $uc = r + \tau + \delta + m - \mathbb{E}[\Delta P/P]$

At baseline $r = 4\%$ and non-rate components = 3%, a 100 bp rate decline implies 14.3%.

Model Results

Experiment: Transitory Rate Decline (QE4 Episode)

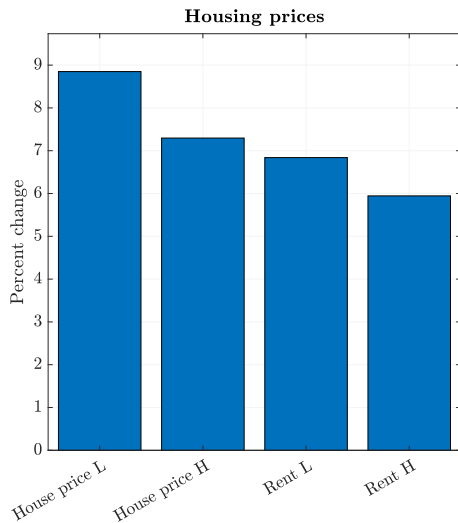
Shock: One model period (4 years), then revert

- Conforming rate: 4% $\rightarrow$ 3% (100 bps decline)
- Jumbo rate: 4% $\rightarrow$ 3.3% (70 bps decline)
- Risk-free rate: 2.5% $\rightarrow$ 1.5% (100 bps decline)

Also account for fiscal transfers

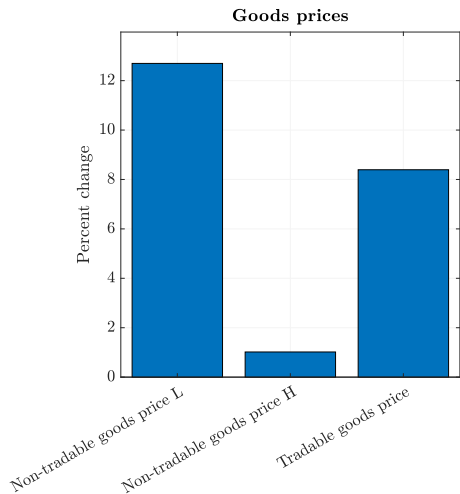
Effects on House Prices

Monetary Easing Leads to 7–9% rises in house prices



Effects on Consumer Goods Prices

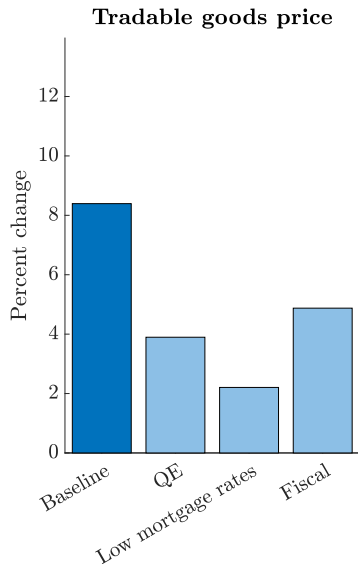
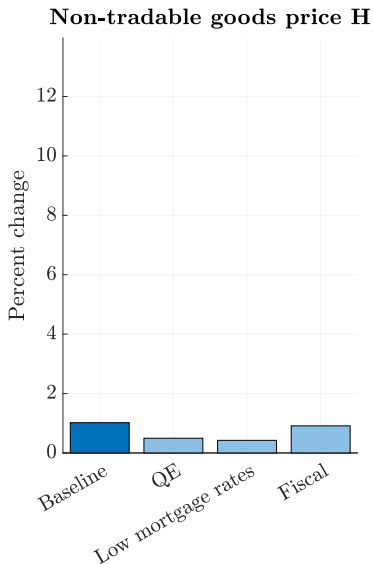
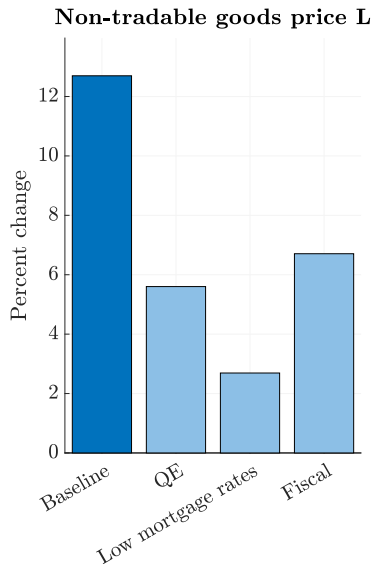
Large Increase in non-tradable good prices in low-cost region



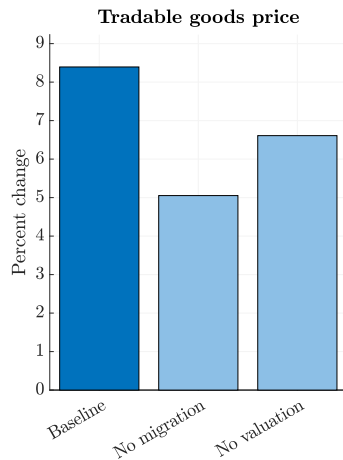
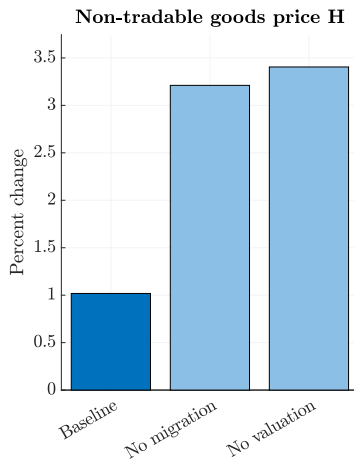
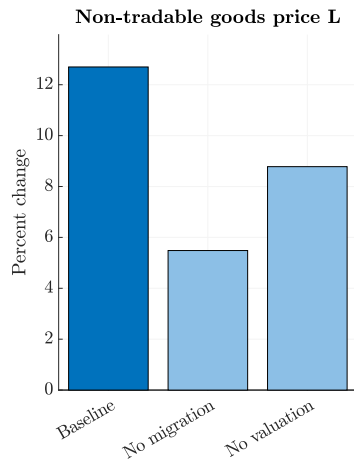
Transmission Mechanisms

1. **Cash Flow Channel:** lower mortgage payments result in higher disposable income
→ Mortgage lock-in means this channel is persistent even after policy tightens
2. **Housing Wealth Channel:** Higher house prices result in wealth effects on consumption
→ Affordability crunch means + wealth effects for owners partially offset by - effects among constrained renters saving for future housing consumption
3. Migration: results in spatial reallocation and demand shifts
4. Tradable goods: transmit inflation shocks across region

Decomposition: Conventional/Unconventional Monetary and Fiscal

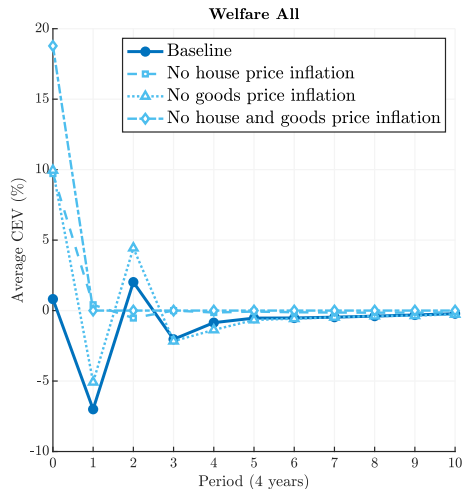


Decomposition: Wealth Effects and Migration

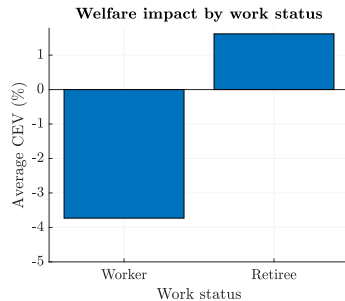
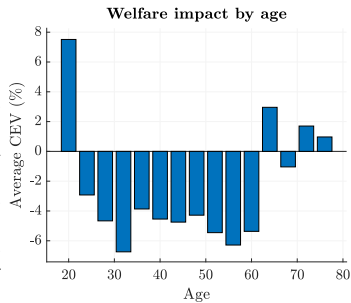
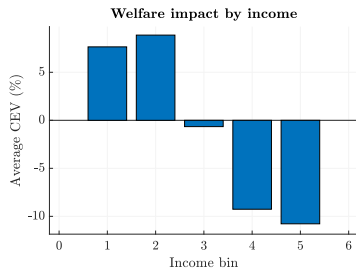


Welfare Analysis

General Equilibrium Analysis Worsens Welfare Analysis



Progressive Impacts on Income, but Young Workers Pay Costs



Affordability Consequences of Unconventional Monetary Policy

1. We use quasi-experimental and structural methods to show aggregate house price effects of unconventional monetary policy
2. We show this contributes meaningfully to broader consumer inflation, especially through cash flow effects
3. Welfare costs borne by younger workers

Appendix

Renter's Problem

Value function for renter in area L :

$$V^{LR} = \max \{ V^{LR,LR}, V^{LR,LS}, V^{LR,LT}, V^{LR,HR}, V^{LR,HS}, V^{LR,HT} \}$$

Stay renting in same area:

$$V^{LR,LR} = \max_{c_t, h_t, b_{t+1}} u(c_t, h_t) + \beta p_a \mathbb{E}_t[V^{LR}(a+1, \dots)]$$

subject to:

$$P_{NT}^L c_{NT} + P_T c_T + R^L h_t + b_{t+1} = y_t + (1 + r^f) b_t, \quad b_{t+1} \geq 0$$

Buying a starter home adds:

- House purchase at price $P^L h^{LS}$, origination fees F_m, f_m
- LTV constraint: $b_{t+1} \geq -\theta_{LTV} P^L h^{LS}$

Housing Supply and Market Clearing

Construction curves:

$$\text{Construct}_t^{jO} = I^{jO} \times (P_t^j)^{\rho^{jO}}, \quad \text{Construct}_t^{jR} = I^{jR} \times \left(\frac{R_t^j}{P_t^j} \right)^{\rho^{jR}}$$

Housing market clearing (owner-occupied, area j):

$$\int_{OWN_t^{jS}} h^{jS} d\lambda_t + \int_{OWN_t^{jT}} h^{jT} d\lambda_t = (1 - \delta) H_{t-1}^{jO} + \text{Construct}_t^{jO}$$

Goods market clearing:

- Non-tradable (segmented): $\int_{ALL_t^j} c_{NT,t}^j d\lambda_t = c_{NT,t}^{S,j}$ for each j
- Tradable (integrated): $\sum_j \int_{ALL_t^j} c_{T,t}^j d\lambda_t = c_{T,t}^S$

$\Rightarrow$ 4 housing + 3 goods = **7 market-clearing conditions**

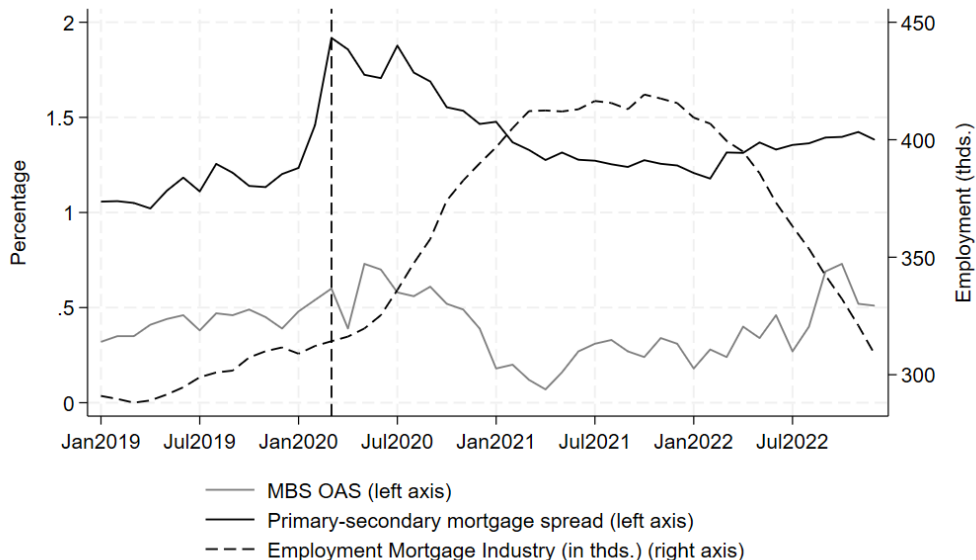
Discontinuity in House Prices [Back](#)

Panel A					
	100k band	50k band	25k band	10k band	5k band
$1_{2020} \times 1_{below\ limit, b}$	0.029*** (0.005)	0.033*** (0.007)	0.041*** (0.01)	0.031** (0.015)	0.032 (0.023)
Observations	350,103	178,786	104,032	59,665	45,323
R ²	0.0011	0.0025	0.0037	0.005	0.0031
$1_{2020} \times 1_{below\ limit, b}$	0.013** (0.006)	0.020** (0.008)	0.035*** (0.011)	0.032** (0.012)	0.047 (0.03)
Observations	350,103	178,786	104,032	59,665	45,323
R ²	0.153	0.1964	0.2313	0.265	0.2732
Year Month FE	Yes	Yes	Yes	Yes	Yes
Zip-code Treatment FE	Yes	Yes	Yes	Yes	Yes
Panel B					
	100k band	50k band	25k band	10k band	5k band
$QE_Flow_{2020, m} \times 1_{below\ limit, b}$	0.010*** (0.003)	0.012*** (0.004)	0.019*** (0.006)	0.015* (0.008)	0.012 (0.012)
Observations	350,103	178,786	104,032	59,665	45,323
R ²	0.0003	0.0018	0.0031	0.0045	0.0026
$QE_Flow_{2020, m} \times 1_{below\ limit, b}$	0.001 (0.003)	0.003 (0.003)	0.009 (0.006)	0.007 (0.006)	-0.002 (0.009)
Observations	350,103	178,786	104,032	59,665	45,323
R ²	0.2736	0.2899	0.3056	0.3296	0.3506
Year Month FE	Yes	Yes	Yes	Yes	Yes
Zip-code Treatment FE	Yes	Yes	Yes	Yes	Yes

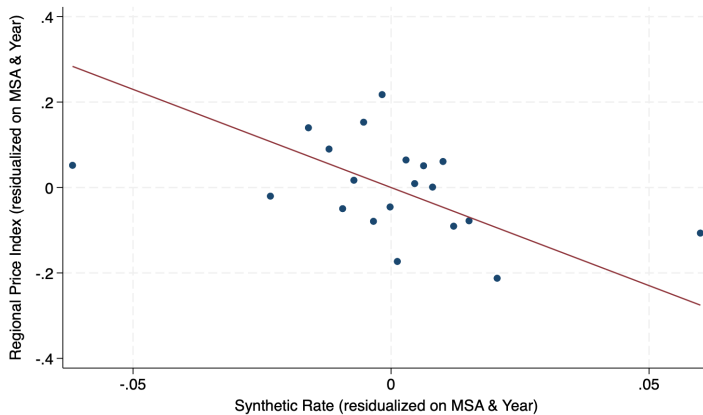
Discontinuity in House Prices [Back](#)

Panel A					
	100k band	50k band	25k band	10k band	5k band
$\mathbb{I}(1_{2020} \times 1_{belowlimit,b})$	0.029*** (0.005)	0.033*** (0.007)	0.041*** (0.01)	0.031** (0.015)	0.032 (0.023)
Observations	350,103	178,786	104,032	59,665	45,323
R ²	0.0011	0.0025	0.0037	0.005	0.0031
$\mathbb{I}(1_{2020} \times 1_{belowlimit,b})$	0.013** (0.006)	0.020** (0.008)	0.035*** (0.011)	0.032** (0.012)	0.047 (0.03)
Observations	350,103	178,786	104,032	59,665	45,323
R ²	0.153	0.1964	0.2313	0.265	0.2732
Year Month FE	Yes	Yes	Yes	Yes	Yes
Zip-code Treatment FE	Yes	Yes	Yes	Yes	Yes
Panel B					
	100k band	50k band	25k band	10k band	5k band
$\mathbb{I}(QE_{Flow2020,m} \times 1_{belowlimit,b})$	0.010*** (0.003)	0.012*** (0.004)	0.019*** (0.006)	0.015* (0.008)	0.012 (0.012)
Observations	350,103	178,786	104,032	59,665	45,323
R ²	0.0003	0.0018	0.0031	0.0045	0.0026
$\mathbb{I}(QE_{Flow2020,m} \times 1_{belowlimit,b})$	0.001 (0.003)	0.003 (0.003)	0.009 (0.006)	0.007 (0.006)	-0.002 (0.009)
Observations	350,103	178,786	104,032	59,665	45,323
R ²	0.2736	0.2899	0.3056	0.3296	0.3506
Year Month FE	Yes	Yes	Yes	Yes	Yes
Zip-code Treatment FE	Yes	Yes	Yes	Yes	Yes

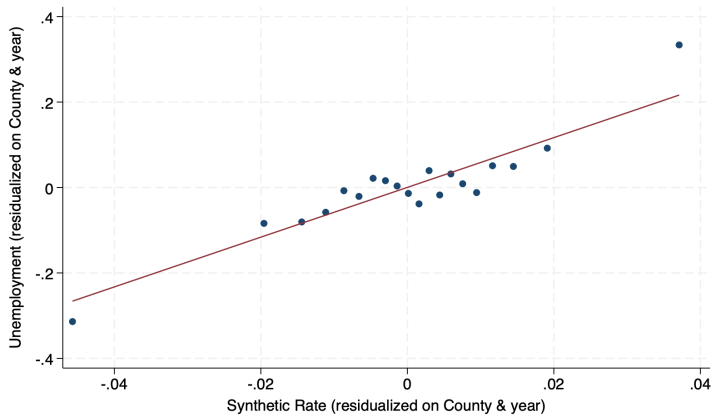
Mortgage Interest Rates and Spreads [Back](#)



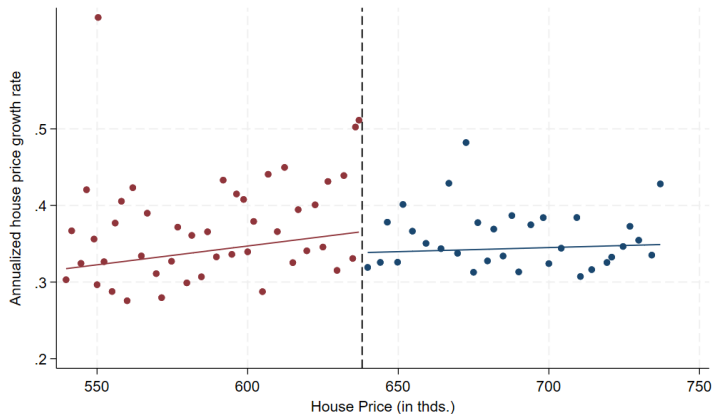
Estimated Local Inflation Effects

[Back](#)

Estimated Local Employment Effects [Back](#)



Threshold Evidence: House Price Running Variable [Back](#)



Data: Infutor Deeds data, 2020. House price growth around $1.25\times$ conforming cutoff (corresponding to 80% LTV). [Table](#)

Model Overview

Dynamic spatial equilibrium life-cycle model with incomplete markets

Households

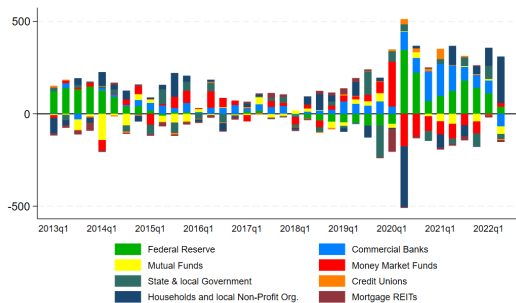
- OLG, 20 periods ($\times$ 4 yrs)
- CRRA-CES preferences over housing, tradable & non-tradable goods
- Idiosyncratic income risk
- Endogenous location, tenure, refinancing, default

Markets

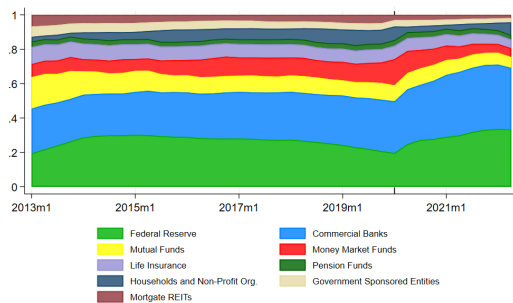
- 2 areas (low/high cost)
- 2 housing sizes (starter/trade-up)
- Owner & rental housing: segmented by area
- Non-tradables: segmented
- Tradables: integrated nationally
- House prices, rents, consumer prices set in general equilibrium

Unprecedented Pace of Federal Reserve MBS Purchases

The Fed purchased roughly \$1.4T in Agency MBS from March 2020-March 2022



Net MBS Purchase Flows



Stock of MBS Holdings