Nonbank Growth and Local Housing Booms

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Motivation

- Rapid rise of *nonbank* mortgage originators in the past decade
    - Accounted for 65% of home-purchase loans in 2022, up from 40% in 2008 (FSOC, 2024)
    - Uneven growth across areas (Kim et al., 2024)

- Well-documented effects of nonbank expansion on various mortgage outcomes:
    - Credit standards, pricing, service quality, loan performance, ...
    - e.g., Degerli and Wang (2022), Fuster et al. (2019), Jiang (2023), Kim et al. (2024)

- **This paper:** How nonbank credit shapes local housing markets
    - Credit supply is a key driver of housing market dynamics (e.g., Adelino et al. 2025)

Nonbank Mortgage Lenders ($\leftrightarrow$ Traditional Banks)

- Lenders outside of conventional banking system

- Common features:

  1. Rely on an originate-to-distribute (OTD) model
     - limited long-term funding *without* consumer deposits or FHLB membership

  2. More risk-tolerant
     - lighter regulatory oversight (Hubbard et al., 2021)
     - technological & operational flexibility (Buchak et al., 2018; Fuster et al., 2019)

     $\Rightarrow$ *Active* support of local credit by nonbanks

     $\Rightarrow$ Upward pressure to local housing demand & prices

An Example: Buy Now, Refi Later

NEWS > PERSONAL FINANCE NEWS

Home Lenders Offering Buy Now, Refinance for Free Later

The incentive is designed to drum up business amid 20-year-high interest rates.

By BEN LUTHI Updated December 08, 2022 04:13 PM EST

- "The whole purpose was to ... help [buyers] unlock that home purchase during this period of uncertainty."

— MarketWatch, Feb. 2023

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  — *MarketWatch, Feb. 2023*

- Programs offered by several **nonbanks**:
  - **Amplify**: zero appraisal fees for future refinance
  - **CrossCountry Mortgage**: $1,500 lender credit for refinance
  - **Guild Mortgage**: no-lender-fee refinance option

Agency Nonbank Origination Share Has Been Rising Steadily

Nonbank Origination Share: All Loans
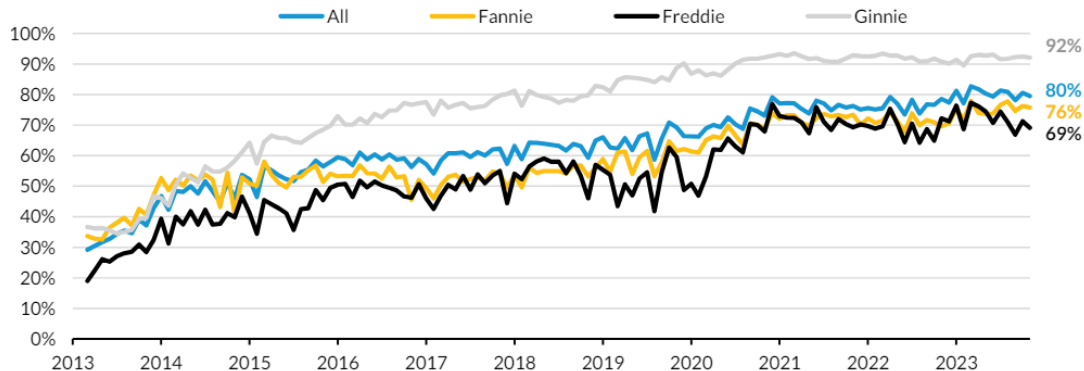
Sources: eMBS and Urban Institute.

List of Active Nonbanks

Top 10 Nonbank Lenders Originated $3 Trillion of Mortgages
By total loan amount, 2018–2022

Top 10 Nonbank Lenders	Amount
Rocket Mortgage	$944.8B
United Wholesale Mortgage	$622.8B
LoanDepot	$331.3B
Fairway Independent Mortgage	$227.3B
Caliber Home Loans	$219.5B
Guaranteed Rate	$193.2B
Home Point Financial	$139.9B
CrossCountry Mortgage	$139.9B
Guild Mortgage	$116.8B
Movement Mortgage	$107.4B

Source: Home Mortgage Disclosure Act data compiled by Consumer Financial Protection Bureau

https://www.bloomberg.com/graphics/2023-nonbank-lender-mortgage-loan-borrower-fee/

Research Question

What is the impact of local nonbank growth on housing market dynamics?

- **This paper investigates:**
    - (i) How increases in nonbank credit supply affect local housing market outcomes
    - (ii) Whether these effects persist over time or disappear
    - (iii) Consequences for within-county price dispersion and the distribution of housing wealth

Research Question

What is the impact of local nonbank growth on housing market dynamics?

- **This paper investigates:**
    - (i) How increases in nonbank credit supply affect local housing market outcomes
    - (ii) Whether these effects persist over time or disappear
    - (iii) Consequences for within-county price dispersion and the distribution of housing wealth

- **Main findings:**
    - (i) Local nonbank growth raises home prices and promotes boom-like market activities
    - (ii) Nonbank credit-driven home appreciation durable only near rich neighborhoods
    - (iii) Within-county price dispersion narrows as nonbank expands

Related Literature

- **Nonbank mortgage lending**
    - Shadow banks expand credit through the OTD model; impacts on pricing and risk (Buchak et al. 2018, 2024; Gete & Reher 2021; Irani et al. 2021; Benson et al. 2024)
    - ⇒ **This paper:** Utilizes an instrument for nonbank growth and links it to local mortgage performance

- **Credit supply & housing market dynamics**
    - Credit expansion affects house prices, volume, and neighborhood composition (Adelino et al. 2025; Di Maggio & Kermani 2017; Favara & Imbs 2015; Favilukis et al. 2017; Landvoigt 2017)
    - ⇒ **This paper:** Nonbank growth as a local credit shock & its effect on prices and volume

- **Neighborhood spillovers during housing booms**
    - Booms accelerate price growth in low-value neighborhoods, especially near affluent areas (Guerrieri et al. 2013; Favilukis et al. 2017)
    - ⇒ **This paper:** Persistent price appreciation near rich areas & overall price convergence within counties

Data

- **HMDA:** Loan-level application data from 2013 to 2021
  - Identify as nonbank if not regulated by any federal regulators (Demyanyk and Loutskina, 2016; Gete and Reher, 2021)
    - 1,376 lenders out of 7,764 (17.3%) identified as nonbanks

- **CoreLogic:** Deeds transfer data capturing over 90% of U.S. property transactions + Multiple Listing Service (MLS) data
  - *Conforming Share*: share of housing transactions eligible for the GSE securitization
  - *Overbid Share*: share of transactions sold above the listing price

- **Supplementary data:**
  - FHFA House Price Index
  - Zillow Observed Rent Index (ZIP Code level rent price index)
  - GSE MBS single-family loan-level datasets

Data: Summary Statistics (Tract-Year-Level Dataset)

	Obs.	Mean	S.D.	P25	P50	P75
Conforming Share	299,701	0.920	0.187	0.950	1.000	1.000
ΔNonbank Share	299,701	0.026	0.163	-0.067	0.025	0.119
HP Growth	299,701	0.065	0.069	0.023	0.059	0.102
Transaction Volume Growth	299,701	0.124	1.544	-0.125	0.026	0.200
ΔPrice-To-Rent	91,467	0.005	0.015	-0.003	0.004	0.011
ΔOverbid Share	242,393	0.043	0.157	-0.032	0.029	0.117
Applicant Income	299,701	1.099	1.286	0.709	0.928	1.258
Female Applicant Share	299,701	0.318	0.136	0.231	0.312	0.400
Minority Applicant Share	299,701	0.083	0.148	0.000	0.029	0.091
Loan-To-Income	299,701	2.816	0.859	2.309	2.694	3.216

Data: Summary Statistics (Loan-Quarter-Level Dataset)

|	Obs.	Mean	S.D.	P25	P50	P75
90+ Delinquency×100	4,371,874	0.236	4.850	0.000	0.000	0.000
Conforming Share	4,371,874	0.960	0.092	0.966	1.000	1.000
Nonbank	4,371,874	0.403	0.491	0.000	0.000	1.000
FICO	4,371,874	755.438	44.549	726.000	766.000	792.000
Initial LTV > 95	4,371,874	0.101	0.301	0.000	0.000	0.000
Current LTV	4,371,874	70.215	15.672	60.672	72.084	81.235
Loan Age	4,371,874	8.502	7.448	3.000	6.000	12.000
Minority	4,371,874	0.084	0.281	0.000	0.000	0.000
Female	4,371,874	0.312	0.463	0.000	0.000	1.000
Co-borrower	4,371,874	0.740	0.439	0.000	1.000	1.000
log(Income)	4,371,874	11.330	0.624	10.897	11.327	11.728
Default Incentive	4,371,874	-0.279	0.189	-0.406	-0.259	-0.142
Refinance Incentive	4,371,874	0.006	0.146	-0.037	0.035	0.095
Underwater	4,371,874	0.051	0.219	0.000	0.000	0.000
Rate Gap	4,371,874	0.146	1.123	-0.358	0.220	0.826

Empirical Design

- **Goal:** Estimate the effect of local nonbank growth on housing market outcomes

- **Challenge:** Credit supply and housing demand are endogenously linked
    - Nonbank lending may drive up home prices
    - But expectation on rising prices may also attract nonbank lenders
      $\Rightarrow$ Need to isolate the causal effect of credit supply from local housing trends

- **Instrument:** *Conforming Share*
    - Only loans below the CLL can be sold to GSEs
      $\Rightarrow$ Stronger incentive for nonbank expansion in high *Conforming Share* areas
    - Important to control local home price levels:
        - *Conforming Share* variation in nonbank growth driven by easiness-to-securitize, unrelated to housing trend

Illustrative Example: Local Conforming-Eligible Shares in Two Tracts

Census Tract *A*

Average HP   CLL
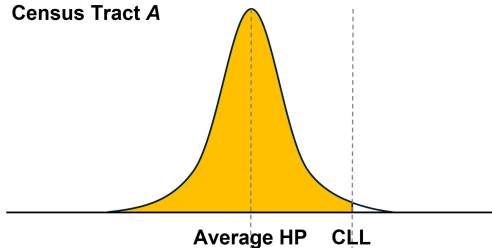
Census Tract *B*
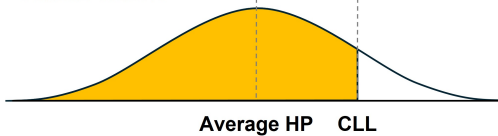
Average HP   CLL
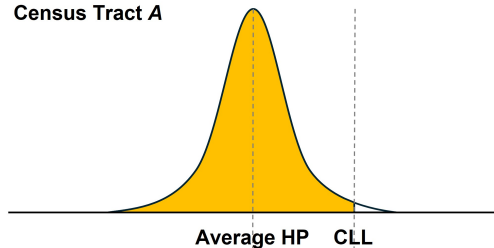
- Tracts *A* and *B* with *identical* average HPs,

Illustrative Example: Local Conforming-Eligible Shares in Two Tracts
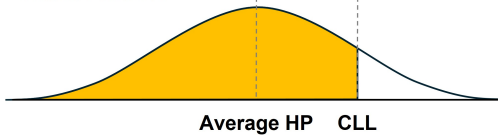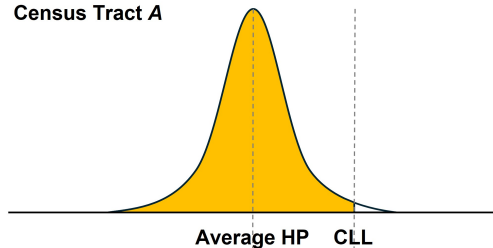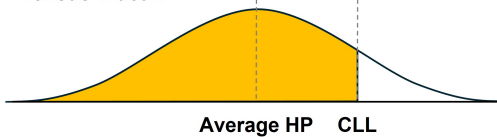

- Tracts *A* and *B* with *identical* average HPs,

  but different price distributions

Illustrative Example: Local Conforming-Eligible Shares in Two Tracts

- Tracts *A* and *B* with *identical* average HPs,

  but different price distributions

- Tract *A* has a higher share of homes below the CLL

  $\Rightarrow$ Stronger incentive for nonbank expansion

2SLS Regression

- The 2SLS regression using tract-level dataset:

$$\Delta Nonbank\ Share_{tract,t} = \alpha + \beta \cdot Conforming\ Share_{tract,t} + \delta \cdot X_{tract,t}$$
$$+ \eta_{hp\ decile} + \eta_{transaction\ volume\ decile} + \eta_{loan\ count\ decile}$$
$$+ \eta_{county \times t} + \epsilon_{tract,t}, \tag{1}$$

$$Y_{tract,t+1} = \alpha + \beta \cdot \widehat{\Delta Nonbank\ Share}_{tract,t} + \delta \cdot X_{tract,t} + \eta_{hp\ decile}$$
$$+ \eta_{transaction\ volume\ decile} + \eta_{loan\ count\ decile} + \eta_{county \times t} + \epsilon_{tract,t}. \tag{2}$$

- $\Delta Nonbank\ Share :=$ change in the nonbank mortgage origination share within a tract
- $Conforming\ Share :=$ share of housing transactions in a tract where 80% of the sale price falls below the CLL
- $Y \in \{HP\ Growth, \Delta Price\text{-}To\text{-}Rent, Transaction\ Volume\ Growth, \Delta Overbid\ Share\}$

First-Stage: Local Conforming Share and Nonbank Growth

	(1)	(2)	(3)	(4)	(5)	(6)
			ΔNonbank Share$_t$			
Conforming Share$_t$	0.0333***	0.0341***	0.0332***	0.0288***	0.0298***	0.0292***
	(16.19)	(16.14)	(15.69)	(13.69)	(14.30)	(14.20)
Avg. Applicant Income				-0.0003	-0.0002	-0.0003
				(-1.03)	(-0.88)	(-1.09)
Avg. Female Applicant Share				0.0028	0.0018	0.0025
				(0.62)	(0.40)	(0.56)
Avg. Minority Applicant Share				0.0224*	0.0212*	0.0163*
				(1.91)	(1.94)	(1.66)
Avg. Loan-To-Income				0.0062***	0.0062***	0.0057***
				(8.35)	(8.25)	(7.66)
HP Decile FE	✓			✓		
Transaction Volume Decile FE	✓			✓		
Loan Count Decile FE	✓	✓		✓	✓	
HP Decile × Transaction Volume Decile FE		✓			✓	
HP Decile × Transaction Volume Decile × Loan Count Decile FE			✓			✓
County × Year FE	✓	✓	✓	✓	✓	✓
Dep. Var. Mean	0.026	0.026	0.026	0.026	0.026	0.026
R-Squared	0.094	0.094	0.099	0.095	0.095	0.099
F-Statistics	192.080	199.633	184.672	134.574	142.614	133.406
Obs.	299,701	299,701	299,701	299,701	299,701	299,701

Local Conforming Share and Growth of Bank and Nonbank Credit

- *Conforming Share* associated with increased credit growth by both banks and nonbanks

  - The growth of nonbank origination is double the size of the growth of bank

	(1)	(2)	(3)	(4)	(5)	(6)
	Bank Loan Growth$_t$			Nonbank Loan Growth$_t$		
Conforming Share$_t$	0.0692***	0.0757***	0.0977***	0.1250***	0.1275***	0.1443***
	(3.69)	(4.27)	(5.24)	(7.90)	(8.77)	(7.39)
HP Decile FE	✓			✓		
Transaction Volume Decile FE	✓			✓		
Loan Count Decile FE	✓	✓		✓	✓	
HP Decile × Transaction Volume Decile FE		✓			✓	
HP Decile × Transaction Volume Decile × Loan Count Decile FE			✓			✓
County × Year FE	✓	✓	✓	✓	✓	✓
Dep. Var. Mean	0.194	0.194	0.194	0.399	0.399	0.399
R-Squared	0.057	0.062	0.116	0.054	0.060	0.131
Obs.	299,701	299,701	299,701	299,701	299,701	299,701

Nonbank Credit and Local Home Price Growth

	(1)	(2)	(3)	(4)	(5)	(6)
			HP Growth$_{t+1}$			
ΔNonbank Share$_t$	0.8265***	0.8075***	0.8759***	0.8198***	0.7929***	0.8615***
	(11.50)	(10.90)	(11.93)	(8.81)	(8.68)	(9.48)
Avg. Applicant Income				-0.0003	-0.0004	-0.0002
				(-1.15)	(-1.23)	(-0.80)
Avg. Female Applicant Share				0.0061	0.0067*	0.0055
				(1.51)	(1.72)	(1.36)
Avg. Minority Applicant Share				0.0088	0.0102	0.0122
				(0.65)	(0.82)	(0.99)
Avg. Loan-To-Income				-0.0050***	-0.0048***	-0.0048***
				(-6.44)	(-6.28)	(-6.25)
HP Decile FE	✓			✓		
Transaction Volume Decile FE	✓			✓		
Loan Count Decile FE	✓	✓		✓	✓	
HP Decile × Transaction Volume Decile FE		✓			✓	
HP Decile × Transaction Volume Decile × Loan Count Decile FE			✓			✓
County × Year FE	✓	✓	✓	✓	✓	✓
Dep. Var. Mean	0.065	0.065	0.065	0.065	0.065	0.065
First Stage F-Stat.	192.080	199.633	184.672	134.574	142.614	133.406
Obs.	299,701	299,701	299,701	299,701	299,701	299,701

Nonbank Credit and Local Price-To-Rent Ratio

	(1)	(2)	(3)	(4)	(5)	(6)
			ΔPrice-To-Rent$_{t+1}$			
$\Delta\widehat{\text{Nonbank Share}}_t$	0.3631***	0.3614***	0.3619***	0.4116***	0.4086***	0.4082***
	(4.27)	(4.44)	(5.24)	(3.15)	(3.28)	(3.83)
Avg. Applicant Income				-0.0000	-0.0000	0.0000
				(-0.04)	(-0.02)	(0.22)
Avg. Female Applicant Share				-0.0019	-0.0017	-0.0013
				(-0.61)	(-0.55)	(-0.42)
Avg. Minority Applicant Share				-0.0001	-0.0003	-0.0003
				(-0.02)	(-0.07)	(-0.06)
Avg. Loan-To-Income				-0.0014**	-0.0014**	-0.0014***
				(-2.34)	(-2.43)	(-2.73)
HP Decile FE	✓			✓		
Transaction Volume Decile FE	✓			✓		
Loan Count Decile FE	✓	✓		✓	✓	
HP Decile × Transaction Volume Decile FE		✓			✓	
HP Decile × Transaction Volume Decile × Loan Count Decile FE			✓			✓
County × Year FE	✓	✓	✓	✓	✓	✓
Dep. Var. Mean	0.005	0.005	0.005	0.005	0.005	0.005
First Stage F-Stat.	21.152	21.281	21.591	12.403	12.718	13.143
Obs.	91,467	91,467	91,467	91,467	91,467	91,467

Nonbank Credit and Local Housing Transaction Volume

	(1)	(2)	(3)	(4)	(5)	(6)
			Transaction Volume Growth$_{t+1}$			
ΔNonbank $\widehat{\text{Share}}_t$	0.9185**	0.9149**	0.8660	1.4066***	1.3962***	1.4141**
	(1.99)	(1.99)	(1.59)	(2.93)	(2.96)	(2.36)
Avg. Applicant Income				0.0005	0.0004	0.0010
				(0.59)	(0.48)	(0.96)
Avg. Female Applicant Share				0.0107	0.0100	0.0057
				(0.78)	(0.72)	(0.39)
Avg. Minority Applicant Share				-0.0928***	-0.0932***	-0.0961***
				(-5.16)	(-5.13)	(-5.62)
Avg. Loan-To-Income				-0.0164***	-0.0162***	-0.0157***
				(-4.38)	(-4.40)	(-3.43)
HP Decile FE	✓			✓		
Transaction Volume Decile FE	✓			✓		
Loan Count Decile FE	✓	✓		✓	✓	
HP Decile × Transaction Volume Decile FE		✓			✓	
HP Decile × Transaction Volume Decile × Loan Count Decile FE			✓			✓
County × Year FE	✓	✓	✓	✓	✓	✓
Dep. Var. Mean	0.124	0.124	0.124	0.124	0.124	0.124
First Stage F-Stat.	192.080	199.633	184.672	134.574	142.614	133.406
Obs.	299,701	299,701	299,701	299,701	299,701	299,701

Nonbank Credit and Bidding Behaviors

	(1)	(2)	(3)	(4)	(5)	(6)
				ΔOverbid Share$_{t+1}$		
$\widehat{\Delta\text{Nonbank Share}}_t$	0.5046***	0.5038***	0.5247***	0.5476***	0.5412***	0.5553***
	(7.17)	(7.62)	(7.57)	(6.76)	(7.06)	(6.85)
Avg. Applicant Income				-0.0003	-0.0003*	-0.0003*
				(-1.58)	(-1.94)	(-1.67)
Avg. Female Applicant Share				0.0013	0.0021	0.0021
				(0.36)	(0.60)	(0.60)
Avg. Minority Applicant Share				-0.0114**	-0.0110**	-0.0077*
				(-2.13)	(-2.31)	(-1.68)
Avg. Loan-To-Income				-0.0040***	-0.0040***	-0.0039***
				(-3.69)	(-3.56)	(-3.39)
HP Decile FE	✓			✓		
Transaction Volume Decile FE	✓			✓		
Loan Count Decile FE	✓	✓		✓	✓	
HP Decile × Transaction Volume Decile FE		✓			✓	
HP Decile × Transaction Volume Decile × Loan Count Decile FE			✓			✓
County × Year FE	✓	✓	✓	✓	✓	✓
Dep. Var. Mean	0.043	0.043	0.043	0.043	0.043	0.043
First Stage F-Stat.	177.009	183.875	173.267	125.917	133.185	127.546
Obs.	242,393	242,393	242,393	242,393	242,393	242,393

Heterogeneous Long-Run Impact of Nonbank Credit

- On average, positive home price growth has continued for several years

- Long-run effect only at the tracts near rich (top quartile median income) areas
  - Guerrieri et al. (2013): housing demand spills over from rich areas to nearby tracts

Nonbank Credit Shock (at $t = 0$) and Cumulative HP Growth

Nonbank Credit and Mortgage Delinquency

- Examine whether similar heterogeneity exists in mortgage performances

- Use *Conforming Share* as an instrument for the nonbank-originated loan dummy

	(1)	(2)	(3)	(4)	(5)	(6)
			90+ Delinquency×100			
	All Sample		Close to Rich Neighborhood		Far from Rich Neighborhood	
$\widehat{\text{Nonbank}}$	-5.9799	-5.1434				
	(-1.04)	(-1.16)				
Loan & Borrower Controls	✓	✓				
HP Decile FE	✓	✓				
Transaction Volume Decile FE	✓	✓				
Loan Count Decile FE	✓	✓				
County × Origin. Year FE	✓	✓				
Report Year FE	✓	✓				
Dep. Var. Mean	0.236	0.236				
First Stage F-Stat.	27.619	35.809				
Obs.	4,371,874	4,371,874				

Nonbank Credit and Mortgage Delinquency

- Examine whether similar heterogeneity exists in mortgage performances

- Use *Conforming Share* as an instrument for the nonbank-originated loan dummy

|	(1)	(2)	(3)	(4)	(5)	(6)
			90+ Delinquency×100			
	All Sample		Close to Rich Neighborhood		Far from Rich Neighborhood	
$\widehat{\text{Nonbank}}$	-5.9799	-5.1434	-3.5674*	-3.2970*		
	(-1.04)	(-1.16)	(-1.66)	(-1.73)		
Loan & Borrower Controls	✓	✓	✓	✓		
HP Decile FE	✓	✓	✓	✓		
Transaction Volume Decile FE	✓	✓	✓	✓		
Loan Count Decile FE	✓	✓	✓	✓		
County × Origin. Year FE	✓	✓	✓	✓		
Report Year FE	✓	✓	✓	✓		
Dep. Var. Mean	0.236	0.236	0.220	0.220		
First Stage F-Stat.	27.619	35.809	74.401	84.291		
Obs.	4,371,874	4,371,874	2,406,774	2,406,774		

Nonbank Credit and Mortgage Delinquency

- Examine whether similar heterogeneity exists in mortgage performances

- Use *Conforming Share* as an instrument for the nonbank-originated loan dummy

	(1)	(2)	(3)	(4)	(5)	(6)
			90+ Delinquency×100			
	All Sample		Close to Rich Neighborhood		Far from Rich Neighborhood	
$\widehat{\text{Nonbank}}$	-5.9799	-5.1434	-3.5674*	-3.2970*	3.2186	3.3995
	(-1.04)	(-1.16)	(-1.66)	(-1.73)	(0.91)	(0.83)
Loan & Borrower Controls	✓	✓	✓	✓	✓	✓
HP Decile FE	✓	✓	✓	✓	✓	✓
Transaction Volume Decile FE	✓	✓	✓	✓	✓	✓
Loan Count Decile FE	✓	✓	✓	✓	✓	✓
County × Origin. Year FE	✓	✓	✓	✓	✓	✓
Report Year FE	✓	✓	✓	✓	✓	✓
Dep. Var. Mean	0.236	0.236	0.220	0.220	0.255	0.255
First Stage F-Stat.	27.619	35.809	74.401	84.291	26.539	21.220
Obs.	4,371,874	4,371,874	2,406,774	2,406,774	1,965,100	1,965,100

Impact on Within-County Price Dispersion

- Nonbank expansion *within* counties may reduce price disparities *across* tracts.

- Specifically:
    - low price area ⇔ high *Conforming Share* → faster price growth
    - high price area ⇔ low *Conforming Share* → slower price growth

- Assess this by tracking within-county price dispersion over time:
    - Dispersion measured via *coefficient of variation* (SD / Mean)
    - Use (i) actual prices and (ii) fitted prices
        - Fitted prices based on the coefficients of nonbank credit channel estimations

Home Price Convergence Within Counties
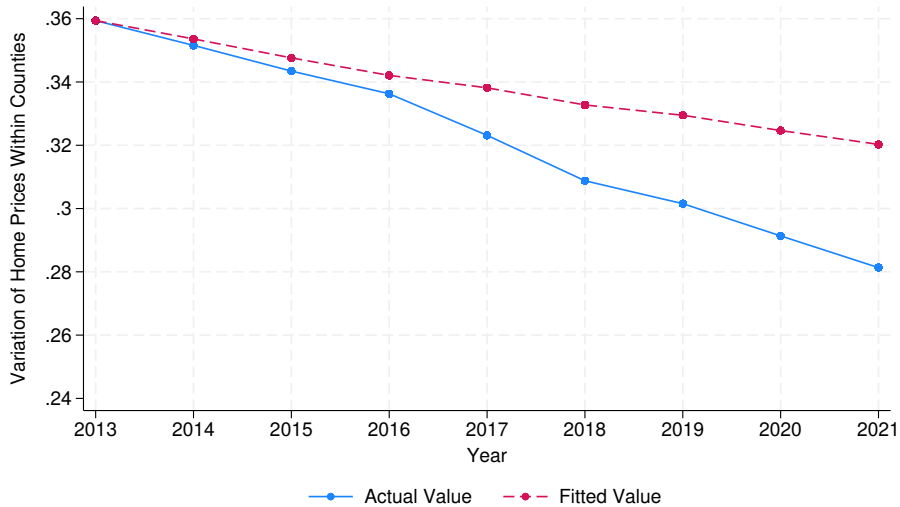
Back-of-the-Envelope Calculation of Wealth Redistribution

- We approximate the additional wealth accrued by homeowners in the bottom 20th percentile of census tracts compared to those in the top 20th percentile:

$$
\begin{aligned}
\textit{Wealth Redistribution} = &(\underbrace{\$100,253}_{\text{Avg. home value in bottom 20th tract}} \times \underbrace{3.783\%}_{\text{fitted HP growth in bottom 20th tract}}) \\
&- (\underbrace{\$698,791}_{\text{Avg. home value in top 20th tract}} \times \underbrace{0.484\%}_{\text{fitted HP growth in top 20th tract}}) \\
&= \underbrace{\$3,792.57}_{\text{home equity gain in bottom 20th tract}} - \underbrace{\$3,382.15}_{\text{home equity gain in top 20th tract}} \\
&= \$410.42.
\end{aligned}
$$

- $410.42 represents a 12.1% larger home equity gain compared to homeowners in the top 20th percentile tracts

Conclusion

- **Nonbank mortgage expansion acts as a local credit shock**
    - Driven by the OTD model and GSE securitizability
    - Leads to easier credit access and localized housing booms

- **Heterogeneous long-run housing effects**
    - Long-lasting price growth near affluent areas; transient elsewhere
    - A similar pattern observed in loan delinquency performance

- **Distributional consequences**
    - Price convergence across tracts: lower-priced areas catch up high areas within county
    - Homeowners in low-price tracts gain more equity
        - Bottom 20% tracts gain additional $410 annually than top 20% tracts

Actual Example: Local Conforming-Eligible Shares in Two Tracts

Conforming Share: 95.33% (Blue) vs. 78.12% (Red)

Mean   CLL

log(Sale Price × 80%)

- Census Tract 0114.05 in Baldwin County, AL
- Census Tract 0513.03 in Sussex County, DE