

Housing Speculation, GSEs, and Credit Market Spillovers

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Research Question and Motivation

- ▶ What effects did the GSEs' rule change to limit purchases of speculative (second and investment homes) and high-risk mortgages have?
 - ▶ Mortgage lending
 - ▶ Non-mortgage lending
 - ▶ Real estate market (transaction and price)
 - ▶ Real effects (housing permit and construction sector employment)
- ▶ Rare opportunity to study a policy that:
 - ▶ Limits the GSEs' subsidy to the mortgage market.
 - ▶ Potentially has cooling effects on the housing market.
- ▶ Indirectly answers the question – “Does housing speculation matter for house prices?”

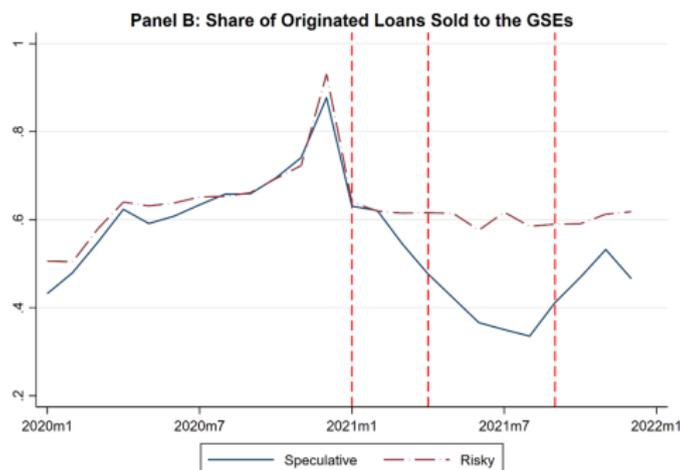
Rule Change

- ▶ Preferred Stock Purchase Agreement (PSPA) was created when Fannie Mae and Freddie Mac were taken into government conservatorship during the GFC.
- ▶ On January 14, 2021, the U.S. Treasury and the FHFA, **announced** additional changes to the PSPA to further strengthen GSE capitalization, along with other changes aimed at limiting their risk exposure.
- ▶ We focus on the following **Purchase Caps**:
 - ▶ Mortgages secured by second homes or investment properties to 7% of SFR acquisitions.
 - ▶ High-risk purchase mortgages to 6% and refinance mortgages to 3% of SFR acquisitions.
- ▶ The caps are applied based on a trailing 52-week period.
- ▶ The caps were implemented on April 1, 2021 and suspended in September 2021.

High-Risk Mortgages

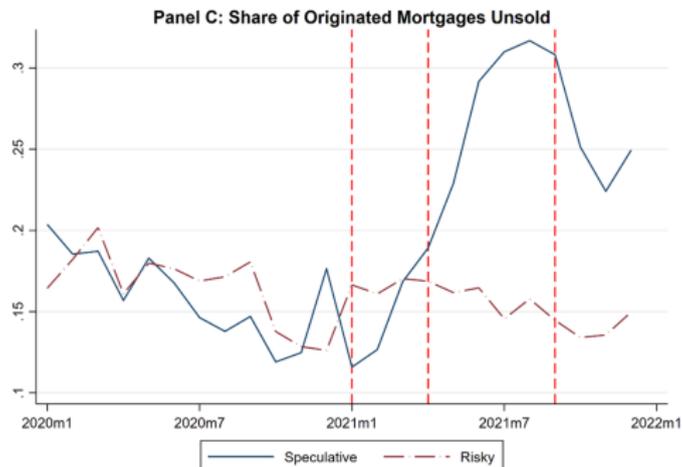
- ▶ A primary residence mortgage is “high-risk” if it has at least two of the following:
 - ▶ Combined loan-to-value (CLTV) greater than 90%.
 - ▶ Debt-to-income (DTI) ratio greater than 45%.
 - ▶ Credit score less than 680.

Shares of Mortgages Sold to the GSEs



- ▶ Purchase and simple refinance mortgages of each type sold to the GSEs divided by all mortgages sold to the GSEs.
- ▶ Share of speculative mortgages sold **DECREASED** after the rule change.
- ▶ Share of high-risk mortgages unsold did not. **Rule change was not binding for high-risk mortgages.**

Shares of Mortgages Unsold



- ▶ Purchase and simple refinance mortgages of each type that were unsold divided by total origination, respectively.
- ▶ Share of unsold speculative mortgages **INCREASED** after the rule change.
- ▶ Share of high-risk mortgages unsold did not. **Rule change was not binding for high-risk mortgages.**

Data

- ▶ **Confidential HMDA** – Mortgage applicant characteristics, loan characteristics, and application outcomes.
- ▶ **CoreLogic** – Housing transaction.
- ▶ **Community Reinvestment Act (CRA) Data from the FFIEC** – Small business lending and CRA assessment area.
- ▶ **FDIC Summary of Deposits** – Bank branch location.
- ▶ **Census Bureau Building Permits Survey** – County-level construction permits.
- ▶ **BLS Quarterly Census of Employment and Wages** – County-level construction sector employment.

Samples of Analysis

- ▶ **Sample period** – 2020Q3 to 2021Q3
- ▶ **Loan-level Sample** – Study impact on lending and sale decisions.
- ▶ **Lender-Quarter-level Sample** – Study impact on credit supply.
- ▶ **Tract-Quarter-level Sample** – Study impact on local housing market.
- ▶ **Lender-County-Quarter-level Sample** – Study lenders' lending decision across loan types and markets.

Methodology – Loan-Level Analysis

- ▶ DiD regression where treated group is speculative/high-risk mortgage and control group is “safe” conforming mortgage.

$$\begin{aligned} Y_{it} = & \alpha + \beta_1 Treated_i \\ & + \beta_2 Treated_i \times Announcement_t \\ & + \beta_3 Treated_i \times Implementation_t \\ & + Controls_i + Time FE + \epsilon_{it}. \end{aligned}$$

- ▶ **i:** Index for loan application.
- ▶ **t:** Index for year-quarter.
- ▶ **Treated:** = 1 for speculative or high-risk mortgage.
- ▶ Announcement = 1 for 2021Q1.
- ▶ Implementation = 1 for 2021Q2 and 2021Q3.

Methodology – Lender-Level Analysis

- ▶ DiD regression comparing lenders where the cap binds and others.

$$Y_{it} = \alpha + \beta_1 \textit{Treatment}_i \times \textit{Announcement}_t \\ + \beta_2 \textit{Treatment}_i \times \textit{Implementation}_t \\ + \textit{Controls}_{it} + \textit{Tract FE} + \textit{Time FE} + \epsilon_{it}.$$

- ▶ **i**: Index for lender.
- ▶ **t**: Index for year-quarter.
- ▶ **Treatment**: = 1 if share of speculative mortgages sold to GSEs in 2020 > 7%.
- ▶ Y = Application and origination volume.
- ▶ Announcement = 1 for 2021Q1.
- ▶ Implementation = 1 for 2021Q2 and 2021Q3.

Methodology – Tract-Level Analysis

- ▶ DiD regression comparing more/less intensely treated tracts.

$$Y_{it} = \alpha + \beta_1 TI_i \times \text{Announcement}_t \\ + \beta_2 TI_i \times \text{Implementation}_t \\ + \text{Controls}_{it} + \text{Tract FE} + \text{Time FE} + \epsilon_{it}.$$

- ▶ **i**: Index for tract.
- ▶ **t**: Index for year-quarter.
- ▶ **TI**: Treatment intensity defined as share of speculative mortgages sold to GSEs in 2020, defined at the tract-level.
- ▶ **Y** = Housing transaction volume, house price.
- ▶ **Announcement** = 1 for 2021Q1.
- ▶ **Implementation** = 1 for 2021Q2 and 2021Q3.

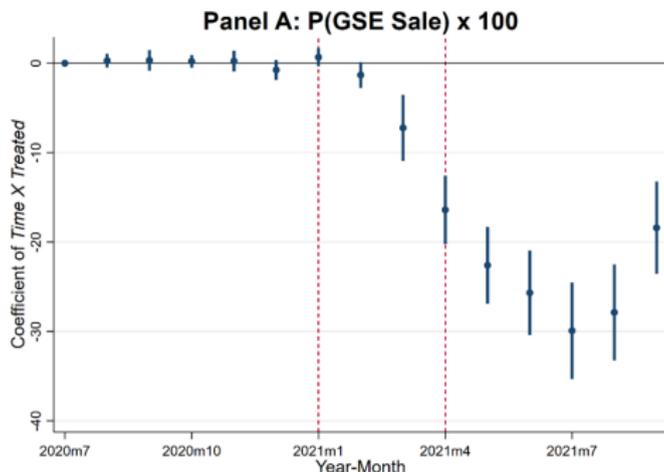
Methodology – Lender-County-Level Analysis

- ▶ DiD regression comparing, within banks, markets where the cap binds and others.

$$Y_{jct} = \alpha + \beta Treatment_{jc} \times Post_t \\ + BankYear FE + CountyYear FE + BankCounty FE + \epsilon_{jct}.$$

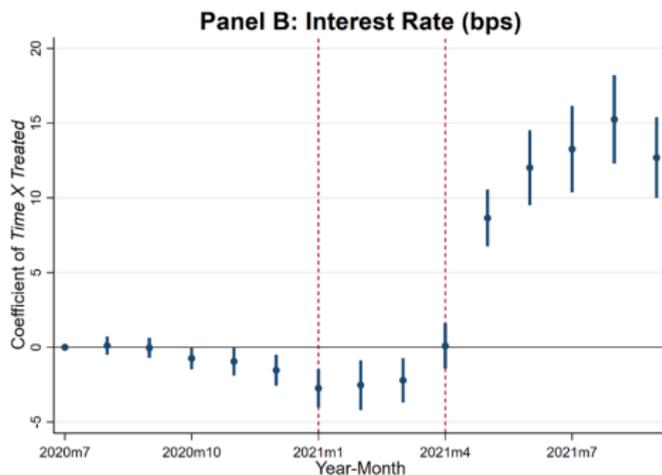
- ▶ **j**: Index for bank.
- ▶ **c**: Index for county.
- ▶ **t**: Index for year.
- ▶ **Treatment**: = 1 if share of speculative mortgages sold to GSEs in 2020 > 7%.
- ▶ Y = Lending growth rate.
- ▶ Announcement = 1 for 2021Q1.
- ▶ Post = 1 for 2021.

Probability of GSE Sale – Speculative Purchase Mortgages



- ▶ For speculative mortgages, probability of sale to the GSEs **DECREASED** by 20%.
- ▶ Lenders are more likely to sell riskier mortgages (higher CLTV, lower credit score).
- ▶ No change in sale probability for high-risk mortgages.

Interest Rate – Speculative Purchase Mortgages



- ▶ Interest rate on originated speculative mortgages **INCREASED** by 10 bps.
- ▶ 2 bps **DECREASE** in interest rate for high-risk mortgages.

Loan-Level Results Recap

- ▶ The rule change:
 - ▶ Decreased speculative mortgages sold to the GSEs.
 - ▶ Increased interest rate on speculative mortgages.
 - ▶ Decreased interest rate on high-risk mortgages.
- ▶ Suggests impact on credit supply of speculative mortgages.
- ▶ Suggests minimal substitution into high-risk mortgage lending.
- ▶ Loan-level analysis cannot say much about the extensive margin so we move to lender-level analysis.

Aggregate Credit Supply Effect – Lender-Level

	Ln(Origination Volume USD)			
	Second Home (1)	Investment (2)	Risky (3)	Safe (4)
Announcement x Treatment	-0.04 [0.03]	0.03 [0.03]	0.05 [0.04]	0.06*** [0.02]
Implementation x Treatment	-0.18*** [0.03]	-0.18*** [0.03]	-0.01 [0.04]	0.02 [0.02]
Observations	7,033	7,540	5,986	8,285
R-squared	0.92	0.92	0.93	0.97
Risky Treatment Controls	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y
Lender FE	Y	Y	Y	Y

- ▶ Credit supply of speculative mortgage **DECREASED**.
- ▶ Little evidence of spillover to other types of mortgages.
- ▶ Similar results for log application volume → lenders discouraged borrowers from applying.

Aggregate Credit Supply Effect – Banks vs. Non-banks

	Ln(Origination Volume USD)			
	Second Home (1)	Investment (2)	Risky (3)	Safe (4)
Announcement x Treatment	-0.06 [0.04]	0.03 [0.04]	0.03 [0.05]	0.05** [0.02]
Implementation x Treatment	-0.12*** [0.05]	-0.16*** [0.04]	-0.09* [0.05]	-0.02 [0.02]
Announcement x Non Bank	0.21*** [0.06]	0.27*** [0.06]	0.17** [0.07]	0.07 [0.05]
Implementation x Non Bank	-0.33*** [0.07]	-0.48*** [0.06]	0.08 [0.07]	-0.02 [0.05]
Announcement x Non Bank x Treatment	-0.04 [0.07]	-0.11 [0.07]	0.03 [0.09]	0.02 [0.07]
Implementation x Non Bank x Treatment	0.07 [0.08]	0.03 [0.08]	0.02 [0.08]	-0.07 [0.06]
Observations	6,826	7,330	5,783	8,068
R-squared	0.93	0.93	0.93	0.97
Risky Treatment Controls				
Year-Quarter FE	Y	Y	Y	Y
Lender FE	Y	Y	Y	Y

- ▶ No difference in response between banks and non-banks
- ▶ Deposits and balance sheet capacity offers no advantage in mortgage lending.

Local Mortgage Lending – Lender-County-Level

	Ln(Second Amount)		Ln(Investment Amount)	
	(1)	(2)	(3)	(4)
Announcement x Treatment	-0.17***	-0.17***	-0.21***	-0.23***
	[0.02]	[0.02]	[0.02]	[0.02]
Implementation x Treatment	-0.22***	-0.21***	-0.21***	-0.23***
	[0.02]	[0.02]	[0.01]	[0.02]
Announcement x Treatment x Bank		0.03		0.04*
		[0.03]		[0.03]
Implementation x Treatment x Bank		0.00		0.04*
		[0.03]		[0.03]
Risky Treatment Controls	Y	Y	Y	Y
Lender-YearQuarter FE	Y	Y	Y	Y
County-YearQuarter FE	Y	Y	Y	Y
Lender-County FE	Y	Y	Y	Y
Sample	All lenders	All lenders	All lenders	All lenders
Observations	108,292	103,893	117,713	113,217
R-squared	0.78	0.78	0.83	0.83

- ▶ Lenders decreased credit supply of speculative mortgages in markets where the cap binds.
- ▶ Lenders manage risks locally (market-by-market) not just at the balance sheet level.
- ▶ Presence of bank branch does not matter.

Spillover to SBL – Lender-County-Level

	Ln(Small Business Loan)	
	(1)	(2)
Post x Treatment	-0.102*** [0.018]	-0.044** [0.021]
Branch		0.975*** [0.217]
Post x Branch		-0.336*** [0.042]
Branch x Treatment		-0.192 [0.175]
Post x Branch x Treatment		0.015 [0.033]
Risky Treatment Controls	Y	Y
Lender-Year FE	Y	Y
County-Year FE	Y	Y
Lender-County FE	Y	Y
Observations	108,978	108,978
R-squared	0.935	0.936

- ▶ Similar effects on small business loans.
- ▶ Spillover could be caused by (1) local information effect or (2) net worth effect via house prices.

Housing Transaction – Tract-Level

	% Speculative Mortgaged Transaction	% Speculative Cash Transaction	% Primary Transaction	% Corporate Transaction
	(1)	(2)	(3)	(4)
Announcement x TI	-0.012** [0.006]	-0.005 [0.005]	0.009 [0.007]	0.006 [0.006]
Implementation x TI	-0.038*** [0.004]	0.003 [0.004]	0.012** [0.005]	0.018*** [0.005]
County COVID-19 Controls	Y	Y	Y	Y
Risky Treatment Controls	Y	Y	Y	Y
Year-Quarter FE	Y	Y	Y	Y
Tract FE	Y	Y	Y	Y
Observations	325,221	325,221	325,221	325,221
R-squared	0.737	0.476	0.756	0.493

- ▶ Speculative mortgaged transaction share **DECREASED**.
- ▶ No effect on speculative cash transaction share.
- ▶ Primary residence transaction share **INCREASED**.
- ▶ Corporate buyer transaction share **INCREASED**.

House Price – Tract-Level

	Average House Price Growth	Median House Price Growth
	(1)	(2)
Announcement x TI	-0.064*** [0.014]	-0.065*** [0.013]
Implementation x TI	-0.031*** [0.008]	-0.019** [0.008]
County COVID-19 Controls	Y	Y
Risky Treatment Controls	Y	Y
Year-Quarter FE	Y	Y
Tract FE	Y	Y
Observations	318,303	318,303
R-squared	0.066	0.069

- ▶ Limiting the GSEs' subsidy in the speculative mortgage market appears to have negative effects on house prices.

Other Results

- ▶ No detectable effects on:
 - ▶ Other types of bank lending (Call Reports).
 - ▶ County-level new SFR permit.
 - ▶ County-level construction employment growth.
 - ▶ County-level construction wage growth.
- ▶ Implies little real effect on the economy possibly due to the cap's short lifespan.

Conclusion

- ▶ Cap on the GSEs' purchase of speculative mortgages was binding.
- ▶ Banks cut speculative mortgage and small business lending in areas where the cap bound locally.
- ▶ Housing transaction and prices decreased in more affected areas.
- ▶ → **Banks manage risk market-by-market.**
- ▶ → **There is possible synergies between risky mortgage lending and small business lending.**
- ▶ → **Speculative credit supply seems to matter for housing transactions and prices.**