

# The Securitization and Solicited Refinancing Channel of Monetary Policy

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## **Big Picture:**

- How does monetary policy propagate through the economy?
- Are there heterogeneous effects?

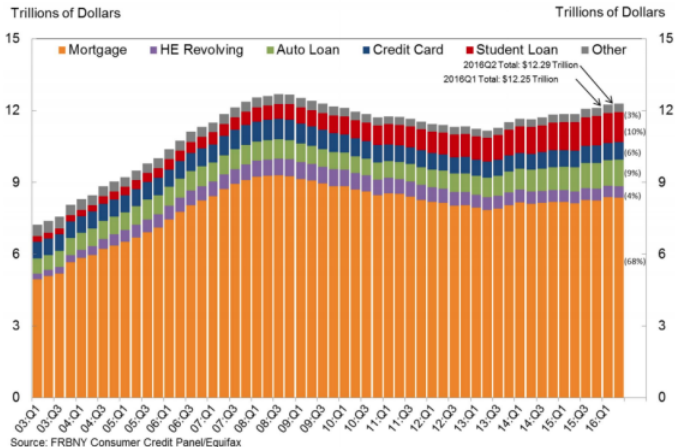
## **Today:**

- Describe and document the 'securitization and solicited refinancing channel', a novel transmission mechanism of monetary policy.
- Investigate the heterogeneous regional effects on refinancing activity and real activity due to this channel.

# Motivation

In the US, home mortgages are the largest portion of household debt.

## Total Debt Balance and its Composition



# Motivation

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- The majority of US mortgages are fixed-rate.
- When mortgage rates decline, households need to refinance to obtain a lower rate → friction in pass-through.
- Refinancing to lower rates helps constrained households with high marginal propensities of consumption to lower their mortgage payments resulting in increased demand.
- The extent to which the decline in market mortgage rates are passed-through to decrease household monthly costs and increase household demand is an important consideration in monetary policy.

# Motivation

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In the wake of the Great Recession, various policies were enacted, including:

- The policy rate was reduced
- A mortgage-backed security purchase program began

*This action is being taken to **reduce the cost and increase the availability of credit** for the purchase of houses. -Initial Fed announcement*

*While we don't expect 100 percent pass-through of MBS yields to mortgage rates, ... over time, **the great majority of the decline in MBS yields does get passed through**. -Bernanke*

# Securitization and Solicited Refinancing Channel

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## 1. Securitization

- If a lender originates a mortgage and then sells it to the GSEs or into a securitization, the lender no longer retains prepayment risk
- The originate-to-sell lender is more likely to want to see the loan refinanced (generating intermediation fees again)

## 2. Solicited Refinance

- The originate-to-sell lender solicits their borrowers to refinance, and the advertisements results in additional refinancing
  - ▶ Roughly 60% of refinances occur with the original lender (SCF)
  - ▶ “Our ... team will reach out to clients *proactively* if the rate changes and we can better their situation via phone, email and mail.”
    - Quicken
  - ▶ Grundl and Kim (2017), Lacour-Little and Chun (1999), Kandrach and Schlusche (2015)

# Securitization and Solicited Refinancing Channel

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## *Hypothesis:*

Originate-to-sell lenders will solicit their borrowers to refinance more often than originate-to-hold lenders, all else equal. The solicitations will result in more borrower refinancing and pass-through occurring at originate-to-sell lenders.

# Securitization and Solicited Refinancing Channel

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## *Hypothesis:*

Originate-to-sell lenders will solicit their borrowers to refinance more often than originate-to-hold lenders, all else equal. The solicitations will result in more borrower refinancing and pass-through occurring at originate-to-sell lenders.

## *I identify the effect on the regional level:*

In response to a decline in MBS yields, regions where originate-to-sell-or-securitize lenders operate will see more refinancing activity than otherwise similar regions where originate-to-hold lenders operate.



## Results Overview

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- Regression results find that in response to a decline in MBS yields, counties with lenders more likely to sell to the GSEs or securitize experience:
  1. higher refinancing as a percentage of outstanding mortgage debt
  2. higher auto debt per capita
- Results remain even after accounting for a competition story (Scharfstein and Sunderam, 2016)

## **Home Mortgage Disclosure Act (HMDA)**

- Annual data with fields include loan amount, loan purpose, property state, property county, and many more.
- Notably missing credit scores, LTV ratios, and rates.

## **NY Fed Consumer Credit Panel Aggregates**

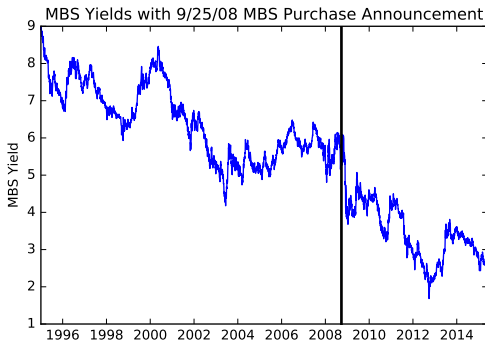
- Estimates of outstanding mortgage debt and auto debt by county and year for counties with 10,000 or more consumers.
- Annual data from 1999 to 2011.

## **Other Sources**

- MBS yields on 30 year, current coupon, Fannie Mae bonds obtained from Bloomberg.
- “Avery File” which aggregates lenders to bank holding companies.
- DTI and credit score data from Fannie Mae Loan Acquisition data
- Home Value Index from Zillow
- Population data from the Census

# Securitization Stylized Facts: MBS Purchases and Yields

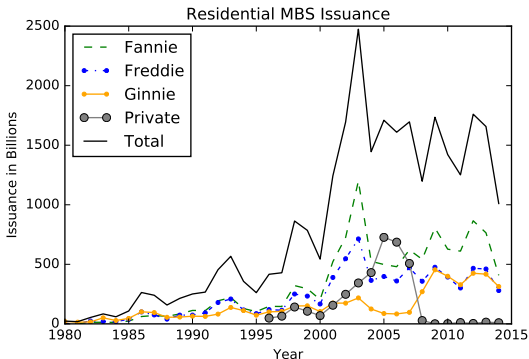
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30-year, current coupon, Fannie Mae MBS yield is plotted. The yield fell dramatically following the Fed's announcement on November 25, 2008. Data are from Bloomberg.

# Securitization Stylized Facts: MBS Issuance

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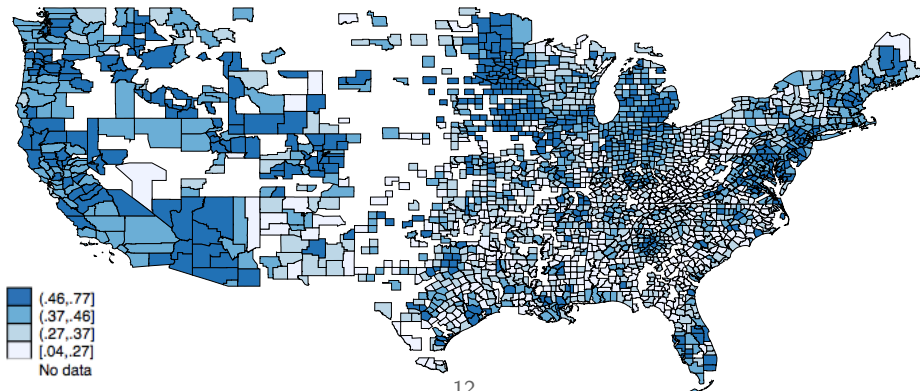
The MBS market is massive. MBS can be issued by the agencies and private issuers. Private issuance had taken off in the early 2000's but has collapsed following the Great Recession. The agencies remain active and securitizing mortgages. Data are from SIFMA.

# Propensity to Securitize

Including loans under the conforming loan limit only,  
I calculate the “propensity to securitize” for county  $i$ , lender  $j$ , and year  $t$ :

$$\text{Propensity}_{i,t} = \sum_j \underbrace{\frac{\text{purchase loans sold}_{-i,j,t}}{\text{total purchase loans}_{-i,j,t}}}_{\text{Lender National Share Sold (excluding own county)}} \times \underbrace{\frac{\text{purchase loans originated}_{i,j,t}}{\text{purchase loans originated}_{i,t}}}_{\text{Lender Local Market Share}}$$

Propensities for 1999:



# Regression Specifications: Overview

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$$\Delta \left( \frac{\text{Refi Balance}}{\text{Outstanding Mortgage Debt}} \right)_{i,t} = \alpha + \beta_1 \Delta \text{MBS Yield}_t + \beta_2 \text{Propensity}_{i,1999} + \beta_3 \Delta \text{MBS Yield}_t \times \text{Propensity}_{i,1999} + X_{i,t} + \epsilon_{i,t}$$

# Regression Specifications: Overview

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$$\Delta \left( \frac{\text{Refi Balance}}{\text{Outstanding Mortgage Debt}} \right)_{i,t} = \alpha + \beta_1 \Delta \text{MBS Yield}_t + \beta_2 \text{Propensity}_{i,1999} + \beta_3 \Delta \text{MBS Yield}_t \times \text{Propensity}_{i,1999} + X_{i,t} + \epsilon_{i,t}$$

- Control for competition

$$\text{Top } 4_{i,1999} = \frac{\text{Count of loans made at largest 4 lenders in the county}_{i,1999}}{\text{Count of loans}_{i,1999}}$$

- Include additional controls: LTI, loan amount, credit score, DTI, home price index
- Assess asymmetry in results between periods when MBS yields fall versus rise
- Change the outcome variable to  $\Delta \left( \frac{\text{Auto Debt}}{\text{Population}} \right)_{i,t}$

# Regressions

Dependent variable:  $\Delta \left( \frac{\text{Refi Balance}}{\text{Outstanding Mortgage Debt}} \right)_{i,t}$

	(1)	(2)	(3)	(4)
$\Delta \text{ MBS Yield}_t$	-0.075*** (-4.080)		-0.075*** (-4.080)	
$\text{Propensity}_{i,1999}$	-0.004 (-1.057)		-0.003 (-1.049)	
$\Delta \text{ MBS Yield}_t \times \text{Propensity}_{i,1999}$	-0.015** (-2.998)	-0.015** (-2.989)	-0.014** (-2.962)	-0.014** (-2.950)
$\text{Top } 4_{i,1999}$			0.002 (1.066)	
$\Delta \text{ MBS Yield}_t \times \text{Top } 4_{i,1999}$			0.006** (2.990)	0.006** (2.928)
R-squared	0.444	0.659	0.446	0.662
N	26604	26604	26604	26604
County and Year FE	N	Y	N	Y

largest 500



# Regressions: Asymmetry and Controls

Dependent variable:  $\Delta \left( \frac{\text{Refi Balance}}{\text{Outstanding Mortgage Debt}} \right)_{i,t}$

	(1)	(2)	(3)
$\Delta \text{ MBS Yield}_t^+ \times \text{Propensity}_{i,1999}$	0.009 (1.525)	0.017** (2.493)	0.010 (1.179)
$\Delta \text{ MBS Yield}_t^- \times \text{Propensity}_{i,1999}$	-0.024*** (-3.793)	-0.017*** (-3.287)	-0.017** (-2.556)
$\Delta \text{ MBS Yield}_t^+ \times \text{Top } 4_{i,1999}$	-0.000 (-0.105)	-0.008 (-1.753)	-0.002 (-0.448)
$\Delta \text{ MBS Yield}_t^- \times \text{Top } 4_{i,1999}$	0.009** (2.565)	0.002 (0.501)	0.005 (1.230)
R-squared	0.669	0.694	0.741
N	26604	26604	9512
County and Year FE	Y	Y	Y
Additional Controls	N	A	B

Set A: LTI and  $\ln(\text{loan amount})$ , both with interactions with  $\Delta \text{MBS yield}$

Set B: Set A, DTI,  $\ln(\text{credit score})$ ,  $\ln(\text{home price})$  and with interactions with  $\Delta \text{MBS yield}$

largest 500

# Real Activity

Dependent variable:  $\Delta \left( \frac{\text{Outstanding Auto Debt}}{\text{Population}} \right)_{i,t}$

	(1)	(2)	(3)	(4)
$\Delta \text{ MBS Yield}_t$	74.246 (0.789)		74.246 (0.789)	
$\text{Propensity}_{i,1999}$	-10.716* (-2.195)		-10.650** (-2.848)	
$\Delta \text{ MBS Yield}_t \times \text{Propensity}_{i,1999}$	-20.258*** (-3.865)	-20.211*** (-3.618)	-19.054*** (-4.506)	-19.004*** (-4.089)
$\text{Top } 4_{i,1999}$			0.323 (0.036)	
$\Delta \text{ MBS Yield}_t \times \text{Top } 4_{i,1999}$			5.903 (0.433)	5.914 (0.429)
R-squared	0.022	0.267	0.022	0.267
N	26604	26604	26604	26604
County and Year FE	N	Y	N	Y

largest 500

# Real Activity: Asymmetry and Controls

Dependent variable:  $\Delta \left( \frac{\text{Outstanding Auto Debt}}{\text{Population}} \right)_{i,t}$

	(1)	(2)	(3)
$\Delta \text{ MBS Yield}_t^+ \times \text{Propensity}_{i,1999}$	-0.157 (-0.011)	0.060 (0.004)	29.701 (1.118)
$\Delta \text{ MBS Yield}_t^- \times \text{Propensity}_{i,1999}$	<b>-27.238**</b> (-2.524)	<b>-23.938*</b> (-2.014)	<b>-33.172**</b> (-3.069)
$\Delta \text{ MBS Yield}_t^+ \times \text{Top 4}_{i,1999}$	-42.599 (-1.133)	-43.855 (-1.316)	-12.785 (-0.239)
$\Delta \text{ MBS Yield}_t^- \times \text{Top 4}_{i,1999}$	27.106 (1.515)	21.906 (1.530)	22.072 (1.140)
R-squared	0.269	0.278	0.334
N	26604	26604	9512
County and Year FE	Y	Y	Y
Additional Controls	N	A	B

Set A: LTI and  $\ln(\text{loan amount})$ , both with interactions with  $\Delta \text{MBS yield}$

Set B: Set A, DTI,  $\ln(\text{credit score})$ ,  $\ln(\text{home price})$  and with interactions with  $\Delta \text{MBS yield}$

largest 500

## Results are qualitatively similar when:

- sample is restricted to largest 500 counties by population some results
- the dependent variable is  $\Delta \left( \frac{\text{Refi Count}}{\text{Population}} \right)_{i,t}$  some results
- using pre-Recession data or post-2004 data some results
- using one year lags, rather than the 1999 measure of propensity
- the calculation of propensity does not restrict to loans under the conforming loan limit and/or include refinance loans

# How Big is this Effect?

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## Size of US Mortgage Market in 2009

- Outstanding mortgage debt on 1-4 family residences was \$11 trillion
- \$911 billion in prime first liens were refinanced
- The median new rate/old rate was .81
- Conditional on refinancing, roughly 8% of housing equity was extracted.

## Hypothetical Back of Envelope

- Suppose every county has its propensity to sell increased by one standard deviation and MBS yields fell by 200 bps.
- An additional  $\approx 4$  percentage points of the outstanding debt would be refinanced,  $\approx \$440$  billion!
- If 8% was cashed out, an additional  $\approx \$35$  billion would be in household's hands!

## Next Steps

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- **Lender level results.** Do borrowers that originate with lenders with a high propensity of selling have a higher probability of refinancing, all else equal? CPR by lender
- **Jumbo loan robustness.** Propensity should affect jumbo loan refinancing prior to 2007, but not after since jumbo loan MBS issuance collapsed.
- **Causality.** Use mergers for an exogenous change to propensity.
- **Model.** Documenting each of the costs, fees, and revenues a lender obtains from originating-to-sell vs originating-to-hold. When would a lender sell a loan and when would a lender signal to a borrower to refinance?

## Conclusions

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Counties with a higher propensity to sell to GSEs or securitizations see increased refinancing activity when MBS yields fall, even after accounting for concentration. This finding has implications for:

- (i) the distributional consequences of MBS purchases
- (ii) the efficacy of MBS purchases to increase refinancing, stimulate demand, and improve economic outcomes
- (iii) how securitization and GSE's play a key role in this pass-through
- (iv) easing lender access to credit reports, so lenders can advertise to borrowers with in-the-money refinance options

THANK YOU!

# Regressions

Sample: Largest 500 counties each year  
 Dependent variable:  $\Delta \left( \frac{\text{Refi Balance}}{\text{Outstanding Mortgage Debt}} \right)_{i,t}$

	(1)	(2)	(3)	(4)
$\Delta \text{ MBS Yield}_t$	-0.088*** (-4.155)		-0.083*** (-4.229)	
$\text{Propensity}_{i,1999}$	-0.004 (-1.111)		-0.003 (-1.053)	
$\Delta \text{ MBS Yield}_t \times \text{Propensity}_{i,1999}$	-0.014** (-2.357)	-0.014** (-2.363)	-0.013** (-2.305)	-0.013** (-2.295)
$\text{Top } 4_{i,1999}$			0.002* (1.983)	
$\Delta \text{ MBS Yield}_t \times \text{Top } 4_{i,1999}$			0.008** (2.498)	0.008** (2.319)
R-squared	0.471	0.736	0.472	0.737
N	5986	5985	5986	5985
County and Year FE	N	Y	N	Y



# Regressions: Asymmetry and Controls

Sample: Largest 500 counties each year  
 Dependent variable:  $\Delta \left( \frac{\text{Refi Balance}}{\text{Outstanding Mortgage Debt}} \right)_{i,t}$

	(1)	(2)	(3)
$\Delta \text{ MBS Yield}_t^+ \times \text{Propensity}_{i,1999}$	0.006 (0.709)	0.010 (1.153)	0.005 (0.526)
$\Delta \text{ MBS Yield}_t^- \times \text{Propensity}_{i,1999}$	-0.021** (-2.348)	-0.017* (-2.060)	-0.019* (-1.981)
$\Delta \text{ MBS Yield}_t^+ \times \text{Top } 4_{i,1999}$	0.000 (0.017)	-0.003 (-0.928)	-0.001 (-0.211)
$\Delta \text{ MBS Yield}_t^- \times \text{Top } 4_{i,1999}$	0.012* (2.095)	0.007 (1.467)	0.010* (1.958)
R-squared	0.739	0.754	0.754
N	5985	5985	4506
County and Year FE	Y	Y	Y
Additional Controls	N	A	B

# Real Activity

Sample: Largest 500 counties each year  
 Dependent variable:  $\Delta \left( \frac{\text{Outstanding Auto Debt}}{\text{Population}} \right)_{i,t}$

	(1)	(2)	(3)	(4)
$\Delta \text{ MBS Yield}_t$	45.622 (0.470)		50.111 (0.562)	
$\text{Propensity}_{i,1999}$	-16.785*** (-3.360)		-15.882*** (-3.282)	
$\Delta \text{ MBS Yield}_t \times \text{Propensity}_{i,1999}$	-13.480 (-1.468)	-16.483 (-1.683)	-12.445 (-1.594)	-15.037 (-1.720)
$\text{Top } 4_{i,1999}$			5.175 (0.639)	
$\Delta \text{ MBS Yield}_t \times \text{Top } 4_{i,1999}$			5.892 (0.500)	8.255 (0.648)
R-squared	0.010	0.475	0.010	0.475
N	5986	5985	5986	5985
County and Year FE	N	Y	N	Y

# Real Activity: Asymmetry and Controls

Sample: Largest 500 counties each year  
 Dependent variable:  $\Delta \left( \frac{\text{Outstanding Auto Debt}}{\text{Population}} \right)_{i,t}$

	(1)	(2)	(3)
$\Delta \text{ MBS Yield}_t^+ \times \text{Propensity}_{i,1999}$	18.182 (1.214)	13.283 (0.788)	32.635 (1.613)
$\Delta \text{ MBS Yield}_t^- \times \text{Propensity}_{i,1999}$	-29.581** (-2.385)	-28.211*** (-3.538)	-32.163** (-2.738)
$\Delta \text{ MBS Yield}_t^+ \times \text{Top } 4_{i,1999}$	-26.103 (-0.797)	-35.252 (-1.121)	-3.148 (-0.090)
$\Delta \text{ MBS Yield}_t^- \times \text{Top } 4_{i,1999}$	23.261 (1.185)	14.041 (0.720)	14.060 (0.714)
R-squared	0.476	0.494	0.550
N	5985	5985	4506
County and Year FE	Y	Y	Y
Additional Controls	N	A	B

# Refi Count/Population

Dependent variable:  $\Delta \left( \frac{\text{Refi Count}}{\text{Population}} \right)_{i,t}$

	(1)	(2)	(3)
$\Delta \text{ MBS Yield}_t^+ \times \text{Propensity}_{i,1999}$	0.001 (0.783)	0.002* (1.984)	0.002 (1.215)
$\Delta \text{ MBS Yield}_t^- \times \text{Propensity}_{i,1999}$	-0.004*** (-4.164)	-0.003** (-2.921)	-0.003** (-2.749)
$\Delta \text{ MBS Yield}_t^+ \times \text{Top } 4_{i,1999}$	-0.000 (-0.237)	-0.001* (-1.953)	-0.001 (-0.965)
$\Delta \text{ MBS Yield}_t^- \times \text{Top } 4_{i,1999}$	0.003*** (3.445)	0.001* (1.975)	0.002** (2.269)
R-squared	0.596	0.650	0.701
N	26604	26604	9512
County and Year FE	Y	Y	Y
Additional Controls	N	A	B

# Varying Sample Years

Dependent variable:  $\Delta \left( \frac{\text{Refi Balance}}{\text{Outstanding Mortgage Debt}} \right)_{i,t}$

	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \text{ MBS Yield}_t^+ \times \text{Propensity}_{i,1999}$	0.015 (0.938)	0.025 (1.493)	0.013 (0.555)	0.001 (0.137)	0.007 (0.952)	0.006 (0.697)
$\Delta \text{ MBS Yield}_t^- \times \text{Propensity}_{i,1999}$	-0.031** (-2.856)	-0.021* (-2.016)	-0.020 (-1.463)	-0.017** (-2.822)	-0.013** (-2.521)	-0.011 (-1.536)
$\Delta \text{ MBS Yield}_t^+ \times \text{Top } 4_{i,1999}$	-0.000 (-0.008)	-0.009 (-0.929)	-0.005 (-0.564)	0.004 (1.019)	-0.002 (-0.688)	0.001 (0.144)
$\Delta \text{ MBS Yield}_t^- \times \text{Top } 4_{i,1999}$	0.012 (1.829)	0.003 (0.411)	0.007 (1.250)	0.005 (1.437)	0.000 (0.026)	0.001 (0.322)
R-squared	0.671	0.700	0.737	0.623	0.646	0.715
N	15514	15514	5091	17735	17735	6996
Years	00-06	00-06	00-06	04-11	04-11	04-11
County and Year FE	Y	Y	Y	Y	Y	Y
Additional Controls	N	A	B	N	A	B

back

# Prepayment Speeds Across Lenders

- Prepayment speeds across lenders do appear to systematically vary.
- A Deutsche bank report from 2014 found Quicken Loans and Nation Star stand out for having faster prepayment rates “across several different cohorts.”

